Management, Operations, and Maintenance (MOM) Program

Revised July 2011

HRSD

Cleaning wastewater every day for a better Bay.

MANAGEMENT, OPERATIONS, AND MAINTENANCE (MOM) PROGRAM

Prepared for
Hampton Roads Sanitation District
December 2008
Revised May 2010
Revised February 2011

Revised July 2011

HRSD
Cleaning wastewater every day for a better Bay.

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ACEC	American Council of Engineering Companies
AMSA	Association of Metropolitan Sewage Agencies
BMP	Best Management Practice
CAP	Condition Assessment Plan
CAS	Compliance Auditing System
CCTV	Closed Circuit Television
CDL	Commercial Drivers License
CEL	Central Environmental Laboratory
CHT	collection, holding & transfer
CIP	Capital Improvement Program
CIS	Customer Information Services
CMMS	Computerized Maintenance Management System
CSR	Collection System Release
DEQ	Virginia Department of Environmental Quality
DMRs	Discharge Monitoring Reports
DPORs	Daily Plant Operating Reports
DQSAP	Data Quality Standards and Procedures
DSRF	Debt Service Reserve Fund
EDS	Enterprise Data Server
EPA	U.S. Environmental Protection Agency
ERP	Emergency Response Plan
FM	Force Main
FOG	Fats, Oil and Grease
FPR	Flow, Pressure and Rainfall
FSEs	Food Service Establishments
FTE	Full-Time Employee
GCDs	Grease Control Devices
GFOA	Government Financial Officers Association of the United States and Canada
GIS	Geographic Information System
GPS	geographic positioning system
HAM	Hydraulic Analysis Manager
HRMS	Human Resources Management System
HRPDC	Hampton Roads Planning District Commission
HRSD	Hampton Roads Sanitation District
HRUBS	Hampton Roads Utility Billing
HRUHCA	Hampton Roads Utility and Heavy Contractors Association
I/I	infiltration and inflow
IFM	Interceptor Force Main
IPA	Interest Participation Agreement
ISPMM	*Interceptor Systems Preventive Maintenance Manual*
LAMP	Leadership and Management Program
LPA	Lease Purchase Agreement
LIMS	Laboratory Information Management System
MACP	Manhole Assessment and Certification Program
mg/L	milligrams per liter
MGD	million gallons per day
MOA	Memorandum of Agreement
MOM	Management, Operations and Maintenance Program
MPORs	Monthly Plant Operating Reports
MUG	Model Users Group
NACWA	National Association of Clean Water Agencies
NASSCO	National Association of Sewer Service Companies
NGIP	National Institute of Governmental Purchasing
NOV	notice of violation
NPDES	National Pollutant Discharge Elimination System
OPC	Open Platform Control
OSHA	Occupational Safety & Health Administration
P3	Pretreatment & Pollution Prevention Division
PACP	Pipeline Assessment and Certification Program
PCAR	Preliminary Condition Assessment Report
PCBs	Polychlorinated Biphenyls
PERC	Perchloroethylene
PIMS	Pretreatment Information Management System
PM	Preventative Maintenance
POTW	publicly owned treatment works
PPE	Personal Protective Equipment
PPM	Physical Plant Maintenance
PRS	Pressure Reducing Station
QST	Quality Steering Team
R&R	refurbishment and replacement
ROW	Rights of Way
RWWMP	Regional Wet Weather Management Plan
SCADA	Supervisory Control and Data Acquisition
SCAT	Sewage Collection and Treatment
SOC	Special Order of Consent
SOP	Standard Operating Procedures
SSD	Sanitary Sewer Discharge
SSES	Sanitary Sewer Evaluation Survey
SSO	Sanitary Sewer Overflow
SSORS	Sanitary Sewer Overflow Reporting System
STP	Sewage Treatment Plant
STWWOP	Short Term Wet Weather Operational Plan
SWOT	strength, weakness, opportunity and threat
SWP3	Storm Water Pollution Preventioin Plan
TBT	Tributyltin
TIMS	Treatment Information Management System
TP	treatment plant
VDH	Virginia Department of Health
VDOT	Virginia Department of Transportation
VELAP	Virginia Environmental Lab Accreditation Program
VPDES	Virginia Pollution Discharge Elimination System
WAN	Wide Area Network
WARN	Water/Wastewater Agency Response Network
WEF	Water Environment Federation
WWTP	Waste Water Treatment Plant
YPORs	Yearly Plant Operating Reports

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EXECUTIVE SUMMARY

Hampton Roads Sanitation District (HRSD), a political subdivision of the Commonwealth of Virginia, provides wastewater treatment services to 17 counties and independent cities in southeast Virginia. HRSD's service area is 3,100 square miles and has an estimated population of 1.6 million. HRSD operates nine major treatment plants in Hampton Roads and four small facilities on the Middle Peninsula. These 13 plants are permitted to treat up to 249 million gallons of wastewater each day. HRSD also operates and maintains a regional interceptor system of approximately 500 miles of pipelines and 81 pump stations.

A Commission of eight members, who are appointed by the Governor for 4-year terms, provides HRSD with direction and ensures public accountability. Administration of the District is under the direction of a General Manager, supported by five department directors and their staff.

Since HRSD's inception, there has been one overriding mission—to protect and enhance the environment through quality wastewater treatment. HRSD has received national, state and local recognition for environmental excellence, including numerous awards for plant performance and outstanding regulatory compliance.

The proper and efficient management, operation and maintenance of the facilities are essential to HRSD's ability to protect public health and the environment. Programs and practices are aligned to minimize Sanitary System Overflows (SSOs) and to provide adequate system capacity. This document provides an overview of the many elements of HRSD's Management, Operations and Maintenance (MOM) program, and explains how the various departments and divisions work together to achieve their MOM goals.

HRSD's Management, Operations and Maintenance Goals:

- Manage, operate and maintain the HRSD collection system effectively and efficiently;
- Investigate suspected capacity constrained areas of the collection system and develop programs to address those constraints;
- Proactively minimize sewer overflows;
- Respond to overflow events effectively to protect public health and the environment; and
- Work with the Localities in the service area to achieve these goals.

HRSD's Commission and staff are dedicated to the attainment of these goals. HRSD's history of environmental excellence and long record of accomplishments reflect the commitment to proper management, operations and maintenance. HRSD's approach to achieving these goals is summarized in the pages that follow and documented in the numerous manuals and written procedures that guide the organization.

This MOM document contains six sections as follows:

- Executive Summary;
- HRSD MOM Program Framework;
- Operations and Maintenance programs;
- Support Programs;

- Improvement Program Areas; and
- System Performance Assessment.

Consistent with U.S. Environmental Protection Agency (EPA) guidance, the MOM Program is an active and working document which presents HRSD's efforts with respect to system capacity, management, operations and maintenance. It refers to provisions of current HRSD programs, procedures and documents, all of which are subject to change in response to experience and other factors. The MOM Program provides the overall framework for HRSD's management of operations and maintenance. Operational circumstances may require adjustments to specifics of the MOM Program. Although the MOM Program itself will be updated every 3 years, it will not be changed to reflect the interim and routine changes in programs, procedures and documents. The first audit and evaluation of the MOM Program will occur one year after EPA approval of the Regional Wet Weather Management Plan.

1. HAMPTON ROADS SANITATION DISTRICT MOM PROGRAM FRAMEWORK

Hampton Roads Sanitation District (HRSD), a political subdivision of the Commonwealth of Virginia, provides wastewater treatment services to 17 counties and independent cities in southeast Virginia. HRSD's service area is 3,100 square miles and has an estimated population of 1.6 million. HRSD operates nine major treatment plants in Hampton Roads and four small facilities on the Middle Peninsula. These 13 plants are capable of treating up to 249 million gallons of wastewater each day. HRSD also operates and maintains a regional interceptor system of approximately 500 miles of pipelines and 81 pump stations.

A Commission of eight members, appointed by the Governor for four-year terms, provides HRSD with direction and ensures public accountability. The General Manager leads the organization, supported by five departments (Engineering, Finance, Operations, Information Services and Water Quality), the Special Assistant for Compliance Assurance, the Communications Division, the Human Resources Division and the Commission Secretary.

The HRSD quality management approach, which encourages innovation and teamwork, has resulted in creative and productive thinking that has distinguished HRSD over the years. The departments operate as cohesive teams, using assets and resources in the most effective manner possible. This facilitates the achievement of the MOM Program goals.

HRSD's MOM Program covers the North Shore and South Shore operating areas. Some information is presented in this document regarding the Middle Peninsula facilities; however, this portion of HRSD's operations will be included in future MOM Programs (see Section 4.8).

This overview chapter provides background information, explains the organizational structure and describes HRSD's infrastructure.

1.1 Background

HRSD's history, mission, vision and values, awards, service area, unique regional approach and MOM goals are highlighted in this section.

1.1.1 History

In 1934, the Virginia General Assembly created the Hampton Roads Sanitation Disposal Commission with instructions to plan the elimination of pollution in Hampton Roads. Recommendations were made to the General Assembly, which resulted in the Sanitary Districts Law of 1938, along with "an Act to provide for and create the Hampton Roads Sanitation District." This Act required qualified voters within the District to decide, in a general election on November 8, 1938, if they favored creation of such a District. This referendum failed to gain a majority by about 500 votes out of nearly 20,000 votes cast and led to a revision of the Act. Another referendum was held on November 5, 1940, which resulted in a majority vote for the creation of the Hampton Roads Sanitation District. The District was named after

Hampton Roads, a four-century-old ship anchorage located near the convergence of the James, Elizabeth and Nansemond Rivers, before they flow into the Chesapeake Bay in southeastern Virginia.

The Enabling Act provides for HRSD to operate as a political subdivision of the Commonwealth of Virginia for the specific purpose of water pollution abatement in Hampton Roads by providing a system of interceptor mains and wastewater treatment plants to handle sewage generated in the region by the surrounding Localities.

HRSD began operations on July 1, 1946, using facilities acquired from the United States government. The Warwick County Trunk Sewer, HRSD's first construction project, began on June 26, 1946, and was funded by HRSD's $6,500,000 Primary Pledge Sewer Revenue Bonds dated March 1, 1946. The Army Base Treatment Plant was HRSD's first treatment plant and began operation on October 14, 1947. The population of HRSD's service area has increased from nearly 288,000 in 1940 to approximately 1.6 million in 2008, and the treatment system has expanded over the years to meet the needs of a growing region.

1.1.2 HRSD's Mission, Vision and Focus Areas

1.1.2.1 HRSD Mission

HRSD's mission is to protect public health and the waters of Hampton Roads by treating wastewater effectively.

1.1.2.2 HRSD Vision

Future generations will inherit clean waterways and be able to keep them clean.

1.1.2.3 HRSD Focus Areas

HRSD has identified five key focus areas:

- People;
- Infrastructure;
- Environmental Impact;
- Operations; and
- Partnerships.

These focus areas provide the structure for implementation of the strategic plan.

1.1.3 Awards

HRSD strives not only to meet, but to exceed environmental requirements at all levels. Award-winning performance and innovation continues to garner national honors.

Recent awards include:

- National Association of Clean Water Agencies (NACWA)
  - Excellence in Management Award (2009-2011)

- Peak Performance Awards (13 for calendar year 2009)
  Peak Performance Awards are presented annually by NACWA to recognize exceptional environmental achievements. HRSD treatment plants have received 226 of these prestigious awards for outstanding compliance with National Pollutant Discharge Elimination System (NPDES) permits since 1986, when NACWA (then AMSA) established the program. All nine major treatment plants qualified for an award for outstanding permit compliance during 2009 :

Army Base Treatment Plant	Platinum 23 Award
Atlantic Treatment Plant	Silver Award
Boat Harbor Treatment Plant	Platinum 8 Award
Chesapeake-Elizabeth Treatment Plant	Silver Award
James River Treatment Plant	Silver Award
Nansemond Treatment Plant	Platinum 8 Award
Virginia Initiative Plant	Platinum 14 Award
Williamsburg Treatment Plant	Platinum 15 Award
York River Treatment Plant	Gold Award
Small Communities Treatment Plants:	
King William Treatment Plant	Gold Award
Mathews Treatment Plant	Gold Award
Urbanna Treatment Plant	Silver Award
West Point Treatment Plant	Silver Award

- Governor's Environmental Excellence Award—2011 Silver Award Recognizing Nansemond Treatment Plant's Three Environmental Improvement Projects
- National Council of Public-Private Partnerships—2010 Innovation Award for the Nansemond Treatment Plant Struvite Recovery Facility.
- United Way of South Hampton Roads—2010 Campaign Bronze Trail Blazer Award
- Water Environment Federation (WEF)
  - 2010 International Operations Challenge Competition
    Division 2: First Place (Overall)
- Presidential Energy Award for Leadership in Federal Energy Management - 2009 for Dam Neck Annex Energy Saving Performance Contract (A U.S. Navy-Trane-HRSD partnership)
- Elizabeth River Project—2010 Sustained Distinguished Performance Model Level River Star Award
- Hampton Roads Utility and Heavy Contractors Association (HRUHCA) 2009 Municipal Award
- Presidential Energy Award for Leadership in Federal Energy Management—2009 for Dam Neck Annex Energy Saving Performance Contract (a U.S. Navy-Trane-HRSD partnership)

- Engineers Club of Hampton Roads 2009 Engineering Excellence Award for Dam Neck Annex Energy Saving Performance Contract (a U.S. Navy-Trane-HRSD partnership)
- Keep Norfolk Beautiful 2009 Environmental Stewardship Award, Green Building Pioneer Category
- American Academy of Environmental Engineers Excellence in Environmental Engineering 2008 Award for the York River Treatment Plant Upgrade and Expansion Phase I designed by Malcolm Pirnie, Inc.
- American Council of Engineering Companies (ACEC) of Virginia 2008 Honor Award for the King William Treatment Plant expansion designed by McKim & Creed PA
- Government Financial Officers Association of the United States and Canada (GFOA) Certificate of Achievement for Excellence in Financial Reporting (27 consecutive years)
- Virginia Tech 2006 Award of Appreciation recognizing HRSD for 30 years of commitment, service and support for the annual Short School for Treatment Plant Operators
- EPA Clean Water Partner Award

Highlights of HRSD's Past Honors

- Water Environment Federation (WEF)
  - 2007 International Operations Challenge Competition
    Division 1: Second Place-Overall
- 2006 Public Information and Education Award for 65th Anniversary Commemorative Calendar
- 2005 Norfolk Grand Illumination Parade Second Place Award to HRSD Employees' Association
- 2004 ACEC of North Carolina Honors Award for Engineering Excellence for the York River Reclamation Facility
- 2004 National Second Place Clean Water Act Recognition Award for Pretreatment Program Excellence
- 2004 National Institute of Governmental Purchasing (NGIP) 25th Anniversary Award
- 2003 AMSA Public Information and Education Award for Ocean Lakes Environmental Education Program
- 2003 Water Reuse Association Outstanding Project of the Year Award for the York River Treatment Plant
- 2002 AMSA Operations Award for Small Communities Program
- 2002 AMSA Public Information and Education Award for Boater Education Program
- 2002 WEF International Operations Challenge Champions
- 2001 AMSA Public Information and Education Award for 60th Anniversary Commemorative Calendar
- 2001 AMSA Public Information and Education Award for Celebrate Farming Day
- 2001 United Way Hero Award recognizing HRSD North Shore (Peninsula) staff for greatest goal increase
- 2001 Virginia Resources Authority Award of Excellence Finalist in recognition of best practices in infrastructure planning, design, and financing

1.1.4 Service Area Descriptions

HRSD's service area includes 17 cities and counties of southeast Virginia, an area of 3,100 square miles with a population of 1.6 million. To ensure responsive assistance and the ability to meet future needs, HRSD works closely with the following communities:

Table 1-1. Service Area Description

Cities	Counties
Chesapeake	Gloucester
Hampton	Isle of Wight
Newport News	James City
Norfolk	King and Queen
Poquoson	King William
Portsmouth	Mathews
Suffolk	Middlesex
Virginia Beach	York
Williamsburg	

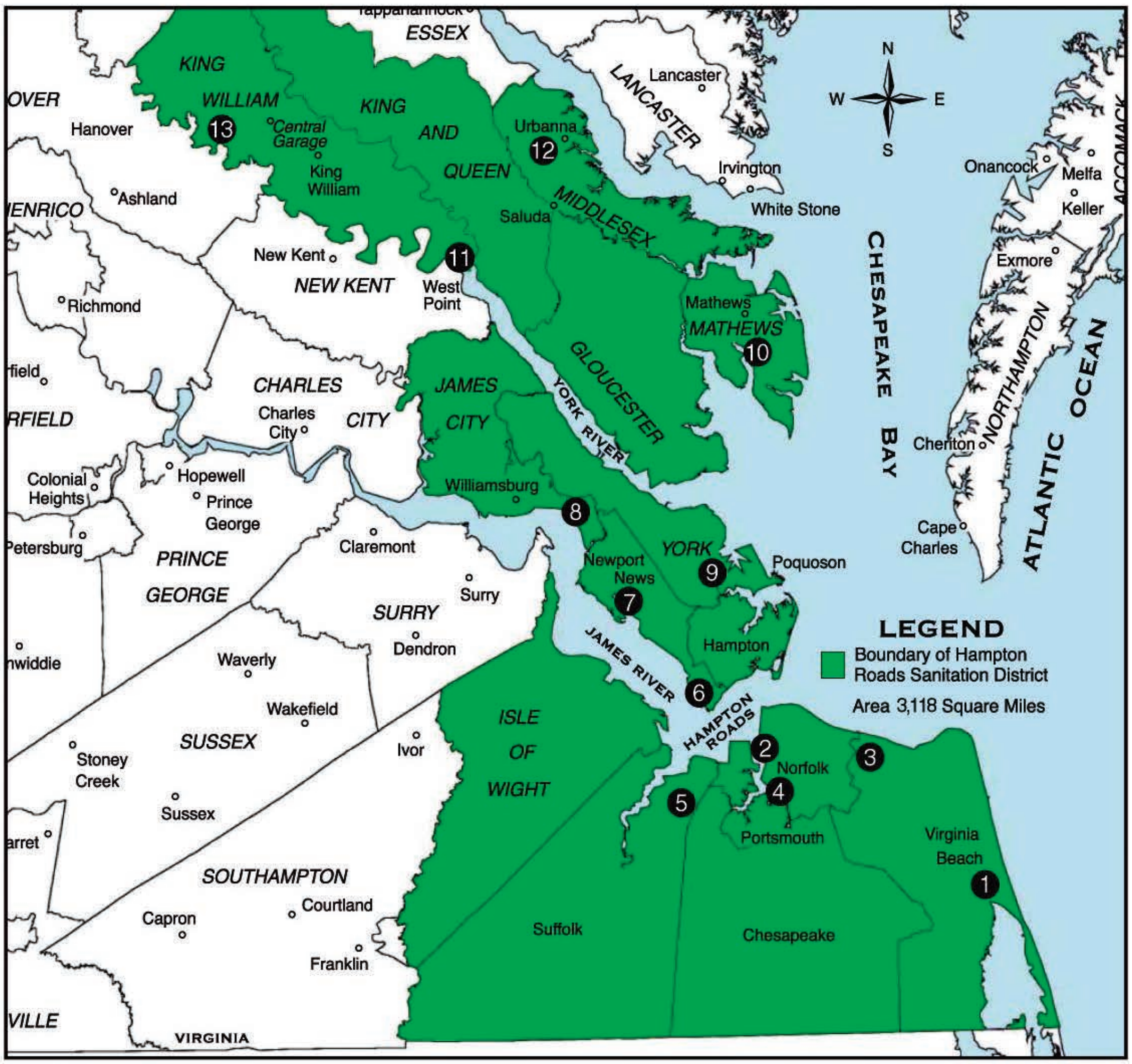
HAMPTON ROADS SANITATION DISTRICT

A Political Subdivision of the Commonwealth of Virginia

Major facilities include the following:

1. Atlantic, Virginia Beach
2. Army Base, Norfolk
3. Chesapeake-Elizabeth, Va. Beach
4. Virginia Initiative, Norfolk
5. Nansemond, Suffolk
6. Boat Harbor, Newport News
7. James River, Newport News
8. Williamsburg, James City County
9. York River, York County
10. Mathews, Mathews County
11. West Point, King William County
12. Urbanna, Middlesex County
13. King William, King William County

Serving the Cities of Chesapeake, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, Williamsburg, and the Counties of Gloucester, Isle of Wight, James City King and Queen, King William, Mathews, Middlesex and York



April, 2005

Figure 1-1. Map of HRSD Region

1.1.4.1 Infrastructure Description

HRSD operates nine major treatment plants in Hampton Roads and four small facilities on the Middle Peninsula. These 13 plants are capable of treating up to 249 million gallons of wastewater each day. HRSD also operates and maintains a regional interceptor system of approximately 500 miles of pipelines and 81 pump stations. HRSD operates and maintains the collection system tributary to the four small treatment plants on the Middle Peninsula. Facilities between the York River and the James River are part of the North Shore system. Facilities south of the James River are part of the South Shore system. This section provides an overview of the facilities managed, operated, and maintained by HRSD.

1.1.4.2 Wastewater Treatment Plants

HRSD operates nine major award-winning treatment plants in Hampton Roads and four smaller plants on the Middle Peninsula. Each of the treatment plants and related achievements are profiled further in this section.

HRSD is recognized as a leader in the industry, with an impressive record of environmental permit compliance. HRSD must comply with Virginia Pollutant Discharge Elimination System (VPDES) permit limitations. The Virginia Department of Environmental Quality (DEQ) issues the permits, which are reviewed, revised (if necessary) and reissued every 5 years.

All of HRSD's treatment plants provide at least secondary level of treatment and several of these facilities currently provide biological nutrient removal. In 2006, the DEQ initiated new regulations that included a mass limit by river basin for both nitrogen and phosphorus. To achieve these new limits, major upgrades are required at four HRSD plants on the James River and one plant on the York River. The first of these upgrades must be completed in 2010, with all work scheduled to be completed by 2017.

HRSD's reputation for not only meeting, but exceeding, environmental regulations prompted the Middle Peninsula Planning District Commission to ask HRSD to serve the major population centers of the area. Protecting the quality of the Chesapeake Bay and its tributaries is critical to the livelihood and recreational activities of these small communities. HRSD agreed to operate and maintain four local treatment plants, 23 pump stations and the collection systems on the Middle Peninsula. The area encompasses approximately 800 square miles and serves approximately 2,715 customers. HRSD has initiated the extensive improvements needed to meet safety regulations; comply with regulatory requirements, and ensure responsive, reliable customer service to the area.

In most instances, wastewater is treated and returned to local waterways. Rather than disposing of highly-treated effluent, HRSD encourages reclaiming this resource through additional treatment processes, where environmentally and economically justified, and replaces potable water where the use of non-potable water is appropriate (e.g., landscape irrigation and many industrial uses). Water reclamation (also called water reuse) maximizes the existing drinking water supply and results in more effective stewardship of such precious water resources.

HRSD handles solids generated at its treatment plants either through incineration, land application, composting or disposal at a permitted landfill. When operationally and economically feasible, HRSD reuses biosolids, a nutrient-rich organic matter that is a by-product of the treatment processes. Recycling helps eliminate landfill disposal of this residual. There are many beneficial uses for biosolids, which must meet stringent federal and state standards for safety. Biosolids collected locally are applied to land as fertilizer, incinerated into ash or processed into Nutri-Green® compost, which is sold to the public. Through HRSD's Pretreatment Program, businesses and industries reduce toxins and other pollutants entering HRSD's system, enhancing the quality of Nutri-Green compost. Ash from incinerated biosolids may also be reused when opportunities exist that are economically feasible.

ARMY BASE TREATMENT PLANT

401 Lagoon Road
Norfolk, Virginia 23505

As of December 29, 2009

The first plant in the HRSD system, Army Base is also the plant that has garnered the greatest number of awards for perfect permit compliance. This facility has had no permit exceptions since 1986—22 consecutive years of exemplary environmental protection and a record unlikely to be matched in the nation.

Table 1-2. Army Base Treatment Plant	
Receiving Stream	Elizabeth River
Operation Startup	1947 (11-MGD primary)
Permitted Design Flow	18 MGD
Peak Hydraulic Capacity	40 MGD
Average Daily Flow (2009)	12.27 MGD
Level of Treatment	Secondary with phosphorus removal
Solids Management	Incineration
Disinfection Method	Liquid sodium hypochlorite and sodium bisulfite
Disinfection Process	Chlorination (plus dechlorination)
Effluent Discharge Limitations: *(reported monthly to the Virginia Department of Environmental Quality)*	• BOD: 30 mg/L (monthly average); 45 mg/L (weekly maximum) • TSS: 30 mg/L (monthly average); 45 mg/L (weekly maximum) • pH: 6.0 S.U. (minimum) to 9.0 S.U. (maximum) • Fecal coliform: 200/100 mL (geometric mean) • Enterococcus: 35/100 mL (geometric mean) • Dechlorination: 0.2 mg/L (monthly average); 2.4 mg/L (weekly maximum) • Phosphorus: 2.0 mg/L (annual average)
Permit Compliance Awards	• Peak Performance Awards are presented annually by the NACWA to recognize exceptional environmental achievements. Army Base has earned these prestigious awards for outstanding compliance with NPDES permits for 22 consecutive years. • Platinum Plus –2008 (22 years) • Platinum (5 consecutive years of no permit violations) – 1997, 2002 • Gold (no permit violations for the year) – 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1998, 1999, 2000, 2001, 2003, 2004, 2005 • Silver (fewer than six violations) – 1986
US EPA Region 3 Awards	1989 Operations and Maintenance Excellence
Virginia Water Pollution Control Association/Virginia State Water Control Board Awards	1989 Excellence in Operations and Maintenance

ATLANTIC TREATMENT PLANT

645 Firefall Drive
Virginia Beach, Virginia 234545

As of December 29, 2009

Table 1-3. Atlantic Treatment Plant	
Receiving Stream	Atlantic Ocean
Operation Startup	1983 (36-MGD secondary)
Permitted Design Flow	54 MGD
Peak Hydraulic Capacity	135 MGD
Average Daily Flow (2009)	25.66 MGD
Level of Treatment	Secondary
Solids Management	Land application
Disinfection Method	Liquid sodium hypochlorite
Disinfection Process	Chlorination
Effluent Discharge Limitations: *(reported monthly to the DEQ)*	• BOD: 30 mg/L (monthly average); 45 mg/L (weekly maximum) • TSS: 30 mg/L (monthly average); 45 mg/L (weekly maximum) • pH: 6.0 S.U. (minimum) to 9.0 S.U. (maximum) • Fecal coliform: 200/100 mL (geometric mean) • Chlorination: 2.5 mg/L (monthly average); 4.0 mg/L (weekly maximum)
Permit Compliance Awards	• Peak Performance Awards are presented annually by NACWA to recognize exceptional environmental achievements. Atlantic has earned these prestigious awards for outstanding compliance with NPDES permits for 22 consecutive years. • Platinum (5 consecutive years of no permit violations) – 1997, 2002, 2007, 2008 • Gold (no permit violations for the year) – 1986 through 1989, 1992 through 1996, 1998 through 2001, 2004 through 2006 • Silver (fewer than six violations) – 1990, 1991, 2003
US EPA National Awards	• 1987 1st Place for Outstanding Operations and Maintenance • 1989 1st Place for Beneficial Reuse of Nutri-Green
US EPA Region 3 Awards	• 1987 Operations and Maintenance Excellence • 1989 Wastewater Management Excellence for Reuse of Nutri-Green
Virginia Water Pollution Control Association/Virginia State Water Control Board Awards	1987 Excellence in Operations and Maintenance
Water Pollution Control Federation Award	1986 George Burke Safety Award

**BOAT HARBOR
TREATMENT PLANT**

300 Terminal Avenue
Newport News, Virginia 23607

As of December 29, 2009

Table 1-4. Boat Harbor Treatment Plant

Receiving Stream	James River (lower)
Operation Startup	1948 (12-MGD primary)
Permitted Design Flow	25 MGD
Peak Hydraulic Capacity	42 MGD
Average Daily Flow (2009)	15.10 MGD
Level of Treatment	Secondary with phosphorus removal
Solids Management	Incineration
Disinfection Method	Liquid sodium hypochlorite and sodium bisulfite
Disinfection Process	Chlorination (plus dechlorination)
Effluent Discharge Limitations: *(reported monthly to the Virginia Department of Environmental Quality)*	• BOD: 30 mg/L (monthly average); 45 mg/L (weekly maximum) • TSS: 30 mg/L (monthly average); 45 mg/L (weekly maximum) • pH: 6.0 S.U. (minimum) to 9.0 S.U. (maximum) • Fecal coliform: 200/100 mL (geometric mean) • Enterococcus: 35/100 mL (geometric mean) • Dechlorination: 0.2 mg/L (monthly average); 1.3 mg/L (weekly maximum) • Phosphorus: 2.0 mg/L (annual average)
Permit Compliance Awards	• Peak Performance Awards are presented annually by NACWA to recognize exceptional environmental achievements. Boat Harbor has earned these prestigious awards for outstanding compliance with NPDES permits for 22 consecutive years. • Platinum Plus – 2008 (7 years) • Platinum (5 consecutive years of no permit violations) – 1997, 2006 • Gold (no permit violations for the year) – 1986, 1987, 1988, 1989, 1991, 1993, 1994, 1995, 1996, 1998, 1999, 2000, 2002, 2003, 2004, 2005 • Silver (fewer than six violations) – 1990, 1992, 2001
Virginia Water Environment Association	1989 Excellence in Operations and Maintenance
Virginia Water Pollution Control Association/Virginia State Water Control Board Awards	1990 Excellence in Operations and Maintenance

CHESAPEAKE-ELIZABETH TREATMENT PLANT

5332 Shore Drive
Virginia Beach, Virginia 234555

As of December 29, 2009

Table 1-5. Chesapeake-Elizabeth Treatment Plant	
Receiving Stream	Chesapeake Bay
Operation Startup	1968 (8-MGD primary)
Permitted Design Flow	24 MGD
Peak Hydraulic Capacity	60 MGD
Average Daily Flow (2009)	21.10 MGD
Level of Treatment	Secondary with phosphorus removal
Solids Management	Incineration
Disinfection Method	Liquid sodium hypochlorite and sodium bisulfite
Disinfection Process	Chlorination plus dechlorination
Effluent Discharge Limitations: *(reported monthly to the Virginia Department of Environmental Quality)*	• BOD: 30 mg/L (monthly average); 45 mg/L (weekly maximum) • TSS: 30 mg/L (monthly average); 45 mg/L (weekly maximum) • pH: 6.0 S.U. (minimum) to 9.0 S.U. (maximum) • Fecal coliform: 200/100 mL (geometric mean) • Dechlorination: 0.2 mg/L (monthly average); 2.4 mg/L (weekly maximum) • Phosphorus: 2.0 mg/L (annual average)
Permit Compliance Awards	• Peak Performance Awards are presented annually by NACWA to recognize exceptional environmental achievements. Chesapeake-Elizabeth has earned 21 of these prestigious awards for outstanding compliance with NPDES permits. • Platinum (5 consecutive years of no permit violations) - 2008 • Gold (no permit violations for the year) – 1986, 1987, 1988, 1989, 1990, 1992, 1993, 1994, 1995, 1996, 2000, 2001, 2002, 2004, 2005, 2006, 2007 • Silver (fewer than six violations) – 1991, 1997, 1998, 2003

**JAMES RIVER
TREATMENT PLANT**

111 City Farm Road
Newport News, Virginia 23602

As of December 29, 2009

Table 1-6. James River Treatment Plant	
Receiving Stream	Warwick River
Operation Startup	1967 (5-MGD secondary)
Permitted Design Flow	20 MGD
Peak Hydraulic Capacity	50 MGD
Average Daily Flow (2009)	13.69 MGD
Level of Treatment	Secondary with phosphorus removal
Solids Management	Nutri-Green® compost/Incineration
Disinfection Method	Liquid sodium hypochlorite and sodium bisulfite
Disinfection Process	Chlorination (plus dechlorination)
Effluent Discharge Limitations: *(reported monthly to the Virginia Department of Environmental Quality)*	• BOD: 30 mg/L (monthly average); 45 mg/L (weekly maximum) • TSS: 30 mg/L (monthly average); 45 mg/L (weekly maximum) • pH: 6.0 S.U. (minimum) to 9.0 S.U. (maximum) • Fecal coliform: 200/100 mL (geometric mean) • Enterococcus: 35/100 mL (geometric mean) • Dechlorination: 0.2 mg/L (monthly average); 0.6 mg/L (weekly maximum) • Phosphorus: 2.0 mg/L (annual average)
Permit Compliance Awards	• Peak Performance Awards are presented annually by NACWA to recognize exceptional environmental achievements. James River has earned 18 of these prestigious awards for outstanding compliance with NPDES permits. • Platinum (5 consecutive years of no permit violations) – 1997, 2007, 2008 • Gold (no permit violations for the year) – 1990, 1993, 1994, 1995, 1996, 1998, 2001, 2003, 2004, 2005, 2006 • Silver (fewer than six violations) – 1989, 1991, 1992, 2000, 2002

NANSEMOND TREATMENT PLANT

6909 Armistead Avenue
Suffolk, Virginia 23435

As of December 29, 2009

Table 1-7. Nansemond Treatment Plant

Receiving Stream	Hampton Roads/James
Operation Startup	1983 (10-MGD secondary)
Permitted Design Flow	30 MGD
Peak Hydraulic Capacity	75 MGD
Average Daily Flow (2009)	18.28 MGD
Level of Treatment	Secondary plus biological nutrient removal (BNR)
Solids Management	Incineration at another plant site (ash recycled for construction fill)
Disinfection Method	Liquid sodium hypochlorite and sodium bisulfite
Disinfection Process	Chlorination (plus dechlorination)
Effluent Discharge Limitations: *(reported monthly to the Virginia Department of Environmental Quality)*	• BOD: 30 mg/L (monthly average); 45 mg/L (weekly maximum) • TSS: 30 mg/L (monthly average); 45 mg/L (weekly maximum) • pH: 6.0 S.U. (minimum) to 9.0 S.U. (maximum) • Fecal coliform: 200/100 mL (geometric mean) • Enterococcus: 35/100 mL (geometric mean) • Dechlorination: 0.2 mg/L (monthly average); 2.4 mg/L (weekly maximum) • Phosphorus: 2.0 mg/L (annual average)
Permit Compliance Awards	• Peak Performance Awards are presented annually by NACWA to recognize exceptional environmental achievements. Nansemond has earned these prestigious awards for outstanding compliance with NPDES permits for 22 consecutive years. • Platinum Plus – 2008 (7 years) • Platinum (5 consecutive years of no permit violations) – 1999, 2006 • Gold (no permit violations for the year) – 1986, 1987, 1990, 1991, 1993, 1995, 1996, 1997, 1998, 2000, 2002, 2003, 2004, 2005 • Silver (fewer than six violations) – 1988, 1989, 1992, 1994, 2001
Virginia Water Environment Association	George Burke Safety Award – 1988, 1991
Virginia Water Pollution Control Association	1988 Outstanding Safety Program

VIRGINIA INITIATIVE TREATMENT PLANT (VIP)

4201 Powhatan Avenue
Norfolk, Virginia 23508

As of December 29, 2009

Table 1-8. Virginia Initiative Treatment Plant (VIP)	
Receiving Stream	Elizabeth River
Operation Startup	1948 (20-MGD primary, formerly the Lamberts Point Plant)
Permitted Design Flow	40 MGD
Peak Hydraulic Capacity	92 MGD
Average Daily Flow (2009)	34.44 MGD
Level of Treatment	Secondary plus biological nutrient removal (BNR)
Solids Management	Incineration
Disinfection Method	Liquid sodium hypochlorite and sodium bisulfite
Disinfection Process	Chlorination (plus dechlorination)
Effluent Discharge Limitations: *(reported monthly to the Virginia Department of Environmental Quality)*	• BOD: 30 mg/L (monthly average); 45 mg/L (weekly maximum) • TSS: 30 mg/L (monthly average); 45 mg/L (weekly maximum) • pH: 6.0 S.U. (minimum) to 9.0 S.U. (maximum) • Fecal coliform: 200/100 mL (geometric mean) • Enterococcus: 35/100 mL (geometric mean) • Dechlorination: 0.2 mg/L (monthly average); 2.4 mg/L (weekly maximum) • Phosphorus: 2.0 mg/L (annual average)
Permit Compliance Awards	• Peak Performance Awards are presented annually by NACWA to recognize exceptional environmental achievements. VIP has earned these prestigious awards for outstanding compliance with NPDES permits for 16 consecutive years. • Platinum Plus – 2006 (11 years), 2007 (12 years), 2008 (13 years) • Platinum (5 consecutive years of no permit violations) – 2000, 2005 • Gold (no permit violations for the year) – 1992, 1994, 1996, 1997, 1998, 1999, 2001, 2002, 2003, 2004 • Silver (fewer than six violations) – 1993, 1995
Other Awards	• 1989 American Academy of Environmental Engineers Honor Award for Research of VIP • 1990 AMSA Research and Technology Award for VIP Process • 1991 American Academy of Environmental Engineers Grand Prize for Design of VIP • 1992 American Consulting Engineers council, Grand Award for Engineering Excellence for Professional Engineering Design - VIP

WILLIAMSBURG TREATMENT PLANT

300 Ron Springs Road
Williamsburg, Virginia 23185

As of December 29, 2009

Table 1-9. Williamsburg Treatment Plant	
Receiving Stream	James River (lower)
Operation Startup	1971 (9.6-MGD secondary)
Permitted Design Flow	22.5 MGD
Peak Hydraulic Capacity	45 MGD
Average Daily Flow (2009)	10.14 MGD
Level of Treatment	Secondary with phosphorus removal
Solids Management	Incineration
Disinfection Method	Liquid sodium hypochlorite and sodium bisulfite
Disinfection Process	Chlorination (plus dechlorination)
Effluent Discharge Limitations: *(reported monthly to the Virginia Department of Environmental Quality)*	• BOD: 30 mg/L (monthly average); 45 mg/L (weekly maximum) • TSS: 30 mg/L (monthly average); 45 mg/L (weekly maximum) • pH: 6.0 S.U. (minimum) to 9.0 S.U. (maximum) • Fecal coliform: 200/100 mL (geometric mean) • Enterococcus: 35/100 mL (geometric mean) • Dechlorination: 0.2 mg/L (monthly average); 2.4 mg/L (weekly maximum) • Phosphorus: 2.0 mg/L (annual average)
Permit Compliance Awards	• Peak Performance Awards are presented annually by NACWA to recognize exceptional environmental achievements. Williamsburg has earned these prestigious awards for outstanding compliance with NPDES permits for 21 consecutive years. • Platinum Plus – 2008 (14 years), 2007 (13 years), 2006 (12 years) • Platinum (5 consecutive years of no permit violations) – 1999, 2004 • Gold (no permit violations for the year) – 1987, 1990, 1991, 1995, 1996, 1997, 1998, 2000, 2001, 2002, 2003, 2004, 2005 • Silver (fewer than six violations) – 1989, 1992, 1993, 1994
US EPA National Awards	• 1987 Finalist for Outstanding Operations and Maintenance • 3 – US EPA Region 3 Awards • 1987 1st Place for Operations and Maintenance Excellence
Virginia Water Pollution Association/Virginia State Water Control Board	• 1987 1st Place for Excellence in Operations and Maintenance

YORK RIVER
TREATMENT PLANT

515 Back Creek Road
Seaford, Virginia 23696

As of December 29, 2009

Table 1-10. York River Treatment Plant

Receiving Stream	York River
Operation Startup	1983 (15-MGD secondary)
Permitted Design Flow	15 MGD
Peak Hydraulic Capacity	37.5 MGD
Average Daily Flow (2009)	12.38 MGD
Level of Treatment	Secondary with phosphorus removal
Solids Management	Nutri-Green compost/Incineration
Disinfection Method	Liquid sodium hypochlorite and sodium bisulfite
Disinfection Process	Chlorination (plus dechlorination)
Effluent Discharge Limitations: *(reported monthly to the Virginia Department of Environmental Quality)*	• BOD: 30 mg/L (monthly average); 45 mg/L (weekly maximum) • TSS: 30 mg/L (monthly average); 45 mg/L (weekly maximum) • pH: 6.0 S.U. (minimum) to 9.0 S.U. (maximum) • Fecal coliform: 200/100 mL (geometric mean) • Enterococcus: 35/100 mL (geometric mean) • Dechlorination: 0.2 mg/L (monthly average); 1.3 mg/L (weekly maximum) • Phosphorus: 2.0 mg/L (annual average)
Permit Compliance Awards	• Peak Performance Awards are presented annually by NACWA to recognize exceptional environmental achievements. York River has earned these prestigious awards for outstanding compliance with NPDES permits for 20 consecutive years. • Platinum (5 consecutive years of no permit violations) - 1997 • Gold (no permit violations for the year) – 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1998, 1999, 2000, 2003, 2005, 2006, 2008 • Silver (fewer than six violations) – 2001, 2002, 2004, 2007
US EPA National Awards	• 1991 2nd Place for Outstanding Operations and Maintenance
US EPA Region 3 Awards	• 1991 Operations and Maintenance Excellence
Virginia Water Pollution Association/Virginia State Water Control Board	• 1991 Excellence in Operations and Maintenance
Virginia Water Environment Association	• 1997 George Burke Safety Award

MIDDLE PENINSULA TREATMENT PLANTS

KING WILLIAM TREATMENT PLANT

542 Acquinton Church Road
King William, Virginia 23086

As of December 29, 2009

Expanded in 2007 to meet projected development, utilizing membrane bio-reactor technology with nutrient removal. It was one of the first MBR facilities in operation in Virginia.

Table 1-11. King William Treatment Plant	
Receiving Stream	Moncuin Creek
Accepted into HRSD	September 1999
Operation Startup	2007 (0.50 MGD MBR)
Permitted Design Flow	0.10 MGD
Peak Hydraulic Capacity	0.2 MGD with 2 treatment trains in service
Average Daily Flow (2009)	0.0238 MGD
Level of Treatment	Secondary (MBR with nutrient removal)
Solids Management	Landfill
Disinfection Method	Wedeco UV system
Disinfection Process	Ultraviolet light
Effluent Discharge Limitations: *(reported monthly to the Virginia Department of Environmental Quality)*	• BOD: 13 mg/L (monthly average); 20 mg/L (weekly maximum) • TSS: 30 mg/L (monthly average); 45 mg/L (weekly maximum) • pH: 6.0 S.U. (minimum) to 9.0 S.U. (maximum) • E. coli: 126/100 mL (geometric mean) • Dissolved oxygen: 5.0 minimum (1/day) • Nitrogen (TKN): 3.0 mg/L, 0.57 KG/D (monthly average); 4.5 mg/L, 0.85 KG/D (weekly maximum)
Permit Compliance Awards	• Silver Award (fewer than six violations) – 2008

**MATHEWS
TREATMENT PLANT**

89 Brickbat Road
Mathews, Virginia 23086

As of December 29, 2009

Constructed by Mathews County in 1972 and transferred to HRSD in July 1999. This facility is served by one of the first vacuum collection systems in the United States.

Table 1-12. Mathews Treatment Plant	
Receiving Stream	Put-In Creek
Accepted into HRSD	July 1999
Permitted Design Flow	0.1 MGD
Peak Hydraulic Capacity	0.2 MGD
Average Daily Flow (2007)	0.072 MGD
Level of Treatment	Secondary with phosphorus removal
Solids Management	Landfill
Disinfection Method	Liquid sodium hypochlorite and sodium bisulfite
Disinfection Process	Chlorination and dechlorination
Effluent Discharge Limitations: *(reported monthly to the Virginia Department of Environmental Quality)*	• BOD: 30 mg/L (monthly average); 45 mg/L (weekly maximum) • TSS: 30 mg/L (monthly average); 45 mg/L (weekly maximum) • pH: 6.0 S.U. (minimum) to 9.0 S.U. (maximum) • Fecal coliform: 200/100 mL (geometric mean) • Dechlorination: 0.039 mg/L (monthly average); 0.043 mg/L (weekly maximum) • Phosphorus: 2.0 mg/L, (monthly average) • Ammonia: 3.5 mg/L (monthly average and weekly maximum)
Permit Compliance Awards	• Peak Performance Awards are presented annually by NACWA to recognize exceptional environmental achievements. Mathews has earned these prestigious awards for outstanding compliance with NPDES permits each year since it became eligible in 2003. • Gold (no permit violations for the year) – 2004, 2005, 2007 • Silver (fewer than six violations) – 2003, 2006, 2008

URBANNA
TREATMENT PLANT

110 Laurel Hill Drive
Urbanna, Virginia 23175

As of December 29, 2009

Constructed by Town of Urbanna in 1972 and transferred to HRSD in July 1999.

Table 1-13. Urbanna Treatment Plant	
Receiving Stream	Urbanna Creek to Rappahannock River
Accepted into HRSD	July 1999
Permitted Design Flow	0.1 MGD
Peak Hydraulic Capacity	0.2 MGD
Average Daily Flow (2007)	0.051 MGD
Level of Treatment	Secondary
Solids Management	Landfill
Disinfection Method	Trojan 1000 UV system
Disinfection Process	Ultraviolet Light
Effluent Discharge Limitations: *(reported monthly to the Virginia Department of Environmental Quality)*	• BOD: 30 mg/L (monthly average); 45 mg/L (weekly maximum) • TSS: 30 mg/L (monthly average); 45 mg/L (weekly maximum) • pH: 6.0 S.U. (minimum) to 9.0 S.U. (maximum) • Fecal coliform: 200/100 mL (geometric mean) • Enterococcus: 35/100 mL (geometric mean) • Dissolved oxygen: 5.0 mg/L monthly avg, 3.2 instantaneous minimum (mg/L) • Ammonia: 3.83 mg/L (seasonal monthly average and weekly maximum, May through October) 9.08 mg/L (seasonal monthly average and weekly maximum, November through April)
Permit Compliance Awards	• Peak Performance Awards are presented annually by NACWA to recognize exceptional environmental achievements. Urbanna has earned these prestigious awards for outstanding compliance with NPDES permits each year since it became eligible in 2003. • Gold (no permit violations for the year) – 2007, 2008 • Silver (fewer than six violations) – 2003, 2004, 2005, 2006

WEST POINT
TREATMENT PLANT

600 23rd Street
West Point, Virginia 23181

As of December 29, 2009

Constructed by the Town of West Point in 1948 and expanded twice. Transferred to HRSD in July 1999.

Table 1-14. West Point Treatment Plant	
Receiving Stream	Mattaponi River to York River
Accepted into HRSD	July 1999
Permitted Design Flow	0.6 MGD
Peak Hydraulic Capacity	1.4 MGD
Average Daily Flow (2006)	0.372 MGD
Level of Treatment	Enhanced Primary –Trickling Filter
Solids Management	Landfill
Disinfection Method	Liquid sodium hypochlorite
Disinfection Process	Chlorination
Effluent Discharge Limitations: *(reported monthly to the Virginia Department of Environmental Quality)*	• BOD: 36 mg/L, 82 kg/d (monthly average); 54 mg/L, 120 kg/d (maximum) • TSS: 36 mg/L, 82 kg/d (monthly average); 54 mg/L, 120 kg/d (maximum) • pH: 6.0 S.U. (minimum) to 9.0 S.U. (maximum) • Fecal coliform: 200/100 mL (monthly average, geometric mean) • Ammonia: 32.2 mg/L (monthly average and weekly maximum) • Chlorination: 1.5 mg/l (minimum); 2.0 mg/l (maximum); 3.5 mg/l (maximum, inst res max tech)
Permit Compliance Awards	• Peak Performance Awards are presented annually by NACWA to recognize exceptional environmental achievements. West Point has earned these prestigious awards for outstanding compliance with NPDES permits each year since it became eligible in 2003. • Gold (no permit violations for the year) – 2004, 2007, 2008 • Silver (fewer than six violations) – 2003, 2005, 2006

1.1.4.3 Interceptor System

HRSD's Interceptor System conveys wastewater from the Localities to one of the nine HRSD wastewater treatment plants. Wastewater generated by residences and businesses usually flows through gravity pipelines owned by a locality. From there, the wastewater flows to a locality-owned pump station where the wastewater is pumped into a large interceptor pipeline owned by HRSD. In a few areas, wastewater flows by gravity from the locality system to an HRSD gravity pipe. Once in the HRSD collection system, the wastewater is typically pumped to a treatment plant where the wastewater is treated and discharged. The schematic below illustrates the wastewater flow path described above.

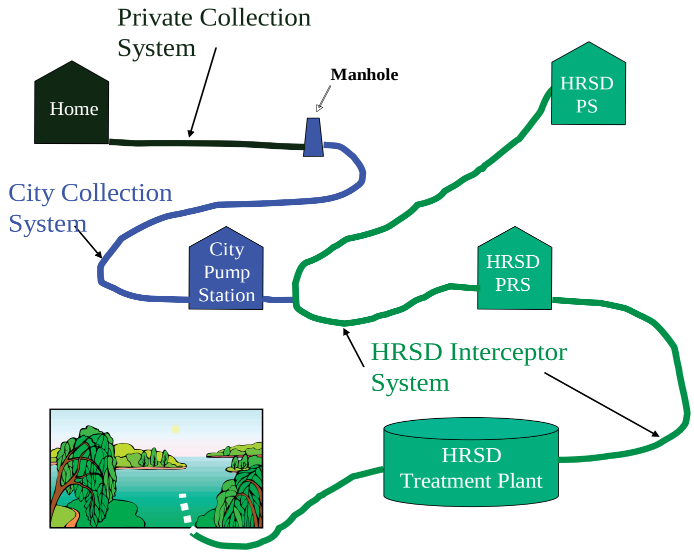


Figure 1-2. HRSD Wastewater Flow Path

The Hampton Roads topography is relatively flat, resulting in the need for a pressurized sewer system. HRSD's system consists primarily of force mains, which are pumped under pressure to deliver wastewater to the treatment plants. HRSD owns some large gravity mains in a few older areas of Hampton Roads which convey flow to large lift pump stations. Overall, approximately 90 percent of HRSD's interceptor system is comprised of force mains. The remaining 10 percent consists of the large gravity mains. Detailed statistics and maps of the interceptor system are provided on Figures 1-3 and 1-4 below.

The interconnectivity of HRSD pipelines allows for certain, limited diversion of flows among treatment plants located along the same shore. (There is no hydraulic connection between the North and South shores.) This diversion capability allows for limited flexibility so flows can be diverted in different directions to enable the plants to utilize capacity to the fullest potential. If a line break occurs in the system, HRSD is sometimes able to isolate the break by closing valves on either side of the break and to redirect the flow to another treatment plant, thus minimizing the potential for large volume overflows from the system.

The HRSD system also utilizes a unique feature—pressure reducing stations (PRSs). These PRSs are in-line pump stations that enable pressure reduction in force mains. HRSD force mains are designed around operating criteria that have been in existence for more than 30 years. These criteria define an energy grade line for each plant system, which defines the maximum pressures expected in HRSD's system.

A Supervisory Control and Data Acquisition (SCADA) system allows HRSD to monitor many different parameters within the interceptor system. SCADA alarms utilized by HRSD include, but are not limited to, pump station overflows, high wet well levels, out of service alarms, back-up/auxiliary power alarms, and equipment failure alarms. Crews are notified of SCADA alarms and respond appropriately to the type of alarm registered.

HRSD has several flow and pressure meters within its system and has implemented a Flow, Pressure and Rainfall (FPR) Monitoring system. This FPR system includes many flow, pressure and rainfall meters and gauges that enable HRSD to better understand system performance and provide data to calibrate a Regional Hydraulic Model.

Table 1-15. HRSD Interceptor System Overview - 2010

	North Shore System	South Shore System
Number of Pump Stations	30	37
Number of PRS Stations	2	13
Total Length of Force Main (ft)	1,020,000	1,726,000
Number of Air Vents	782	1562
Number of Valves	1201	2039
Total Length of Gravity Main (ft)	177,000	134,000
Number of Gravity Manholes)	713	640

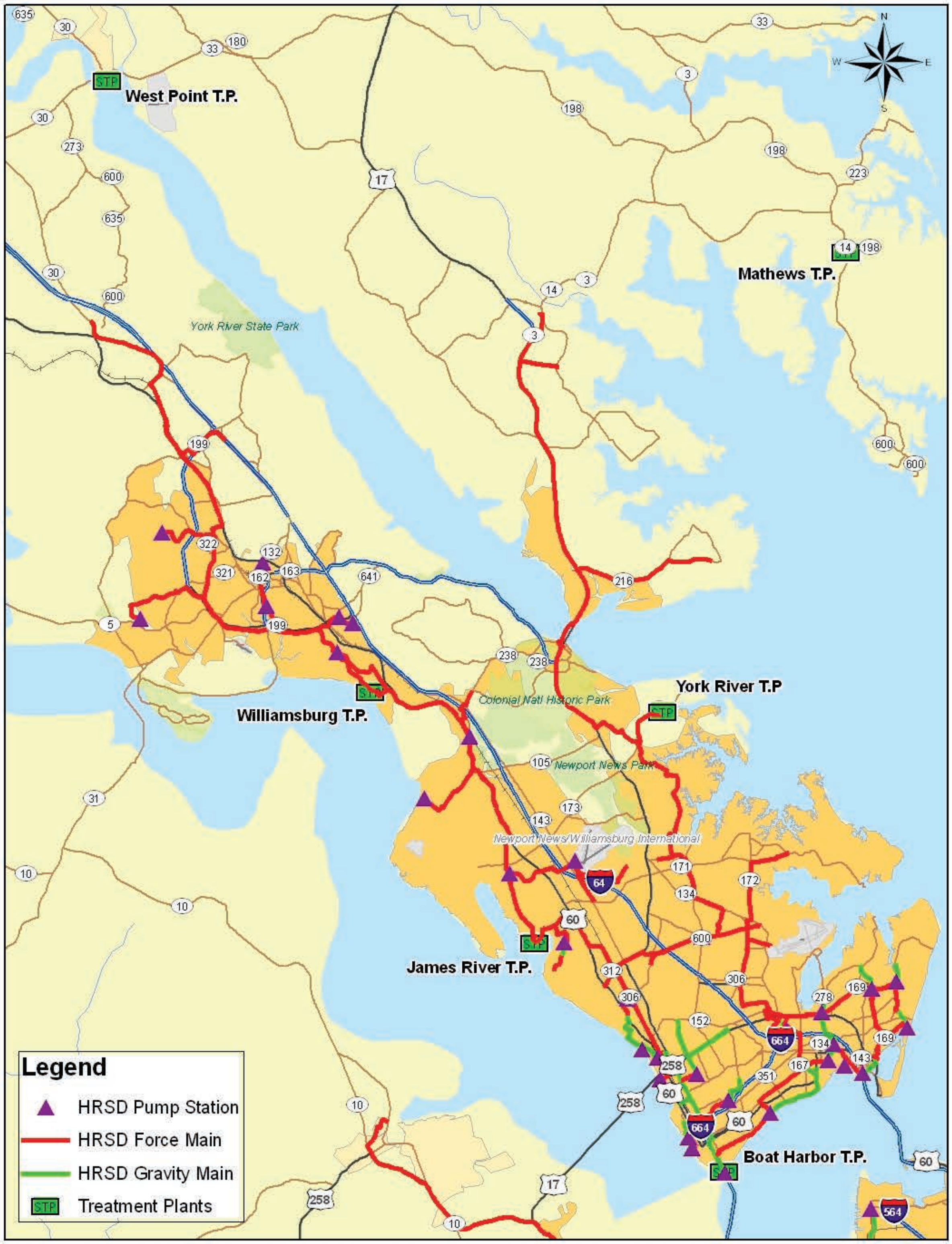


Figure 1-3. HRSD North Shore Interceptor System

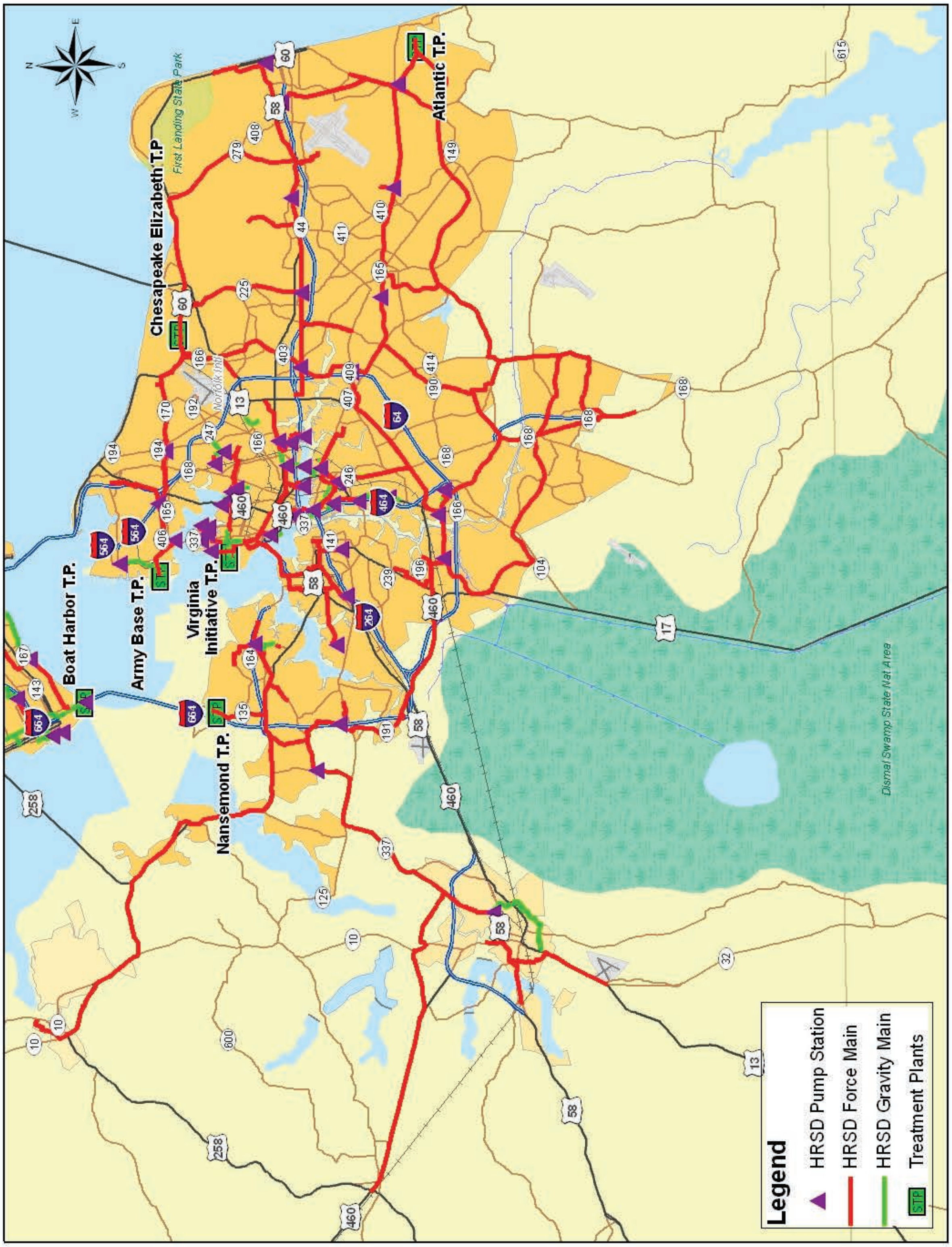


Figure 1-4. HRSD South Shore Interceptor System

1.1.5 A Unique Regional Approach

The state legislation that created HRSD in 1940 established a regional approach to wastewater treatment unlike any other in the United States. The General Assembly endowed HRSD, which is a political subdivision of the Commonwealth of Virginia, with the responsibility to "provide for the public health and welfare." HRSD's enabling legislation provided for various authorities necessary to conduct business. These powers and authorities are detailed in Section 3.10 – Legal Support Programs.

There are no formal contracts between HRSD and the Localities served. A city or county that wishes to become a part of the district must petition the Circuit Court to become a member of HRSD. The legislature ultimately amends the Enabling Act to include the new jurisdictions.

The unique regional structure requires collaboration with multiple entities to ensure proper management, operations and maintenance of the regional system is achieved. HRSD works closely with each jurisdiction that contributes flow to the regional system. Regular meetings are held with many of the Localities to discuss planning and operational issues. HRSD representatives attend meetings of the region's utility directors and the Capacity Team (composed of technical representatives from some Localities and HRSD), and participate in a variety of regional initiatives. These include the Hampton Roads Partnership, the Hampton Roads Chamber of Commerce, the Virginia Peninsula Chamber of Commerce and a host of committees organized by the Hampton Roads Planning District Commission (HRPDC).

The regional approach includes HRSD's oversight of industries and small businesses that discharge wastewater to HRSD. HRSD's Pretreatment and Pollution Prevention Division (P3) is empowered to regulate these businesses and industries, including the authority to assess administrative charges if necessary. HRSD levies surcharges for certain types of high-strength waste that comes into its system and invoices these businesses accordingly. All businesses must comply with HRSD's pretreatment requirements and are subject to periodic inspections.

To assess adequate capacity, new development that is to connect to the HRSD system goes through a flow acceptance process. The Localities and HRSD, in consultation with DEQ, review the proposed connections before allowing new or additional flow to be added to the system. The Industrial Wastewater Discharge Regulations provide guidance on what materials are acceptable and what may be prohibited for discharge into the system. Through HRSD's Industrial Wastewater Discharge Regulations and interceptor policies, HRSD has the authority to enforce actions on entities that contribute excessive grit and grease; infiltration and inflow (I/I), storm water connections, and water from other sources such as sump pumps, air conditioning and landfills. Additionally, HRSD has a Real Estate Division that oversees HRSD's property acquisition and easements, and restricts the building of any structures over pipelines.

1.1.6 MOM Goals

The goals of the MOM Program include:

- Manage, operate and maintain the HRSD interceptor system effectively and efficiently
- Investigate suspected capacity constrained areas of the collection system and develop programs to address those constraints
- Proactively minimize sewer overflows
- Respond to overflow events effectively to protect public health and the environment
- Work with the Localities to achieve these goals

1.1.7 Consent Orders/Consent Decree

HRSD is currently a party to a regional Special Order by Consent (SOC) issued by the DEQ. This SOC is a multi- party enforcement action that involves HRSD, DEQ and a number of Localities (Cities of Chesapeake, Hampton, Newport News, Poquoson, Portsmouth, Suffolk, Virginia Beach and Williamsburg, the counties of Gloucester, Isle of Wight and York, the town of Smithfield and the James City Service Authority). The SOC requires the parties to collect flow monitoring data, assess their respective systems, perform Sanitary Sewer Evaluation Survey (SSES) work, prepare rehabilitation plans, develop local and regional models, develop MOM programs and prepare a Regional Wet Weather Management Plan to address identified capacity challenges. These efforts are ongoing and involve significant collaboration across the region.

In addition, HRSD has an older SOC with the City of Norfolk that deals with the same issues. To date, Norfolk has performed an SSES and prepared a Long-Term Control Plan. That plan is currently in the implementation phase. Norfolk has been an active participant in the broader regional effort and their flows will be considered in the regional model and in the development of the Regional Wet Weather Management Plan.

HRSD entered into a Federal Consent Decree with the United States Environmental Protection Agency and the Department of Justice. This decree was entered with the Court on February 23, 2010. The compliance requirements outlined in the decree including the following:

- Flow, Pressure and Rainfall Monitoring
- Regional Hydraulic Model and Hydraulic Assessment
- Condition Assessment
- Interim System Improvements
- Management, Operations and Maintenance Program
- Regional Wet Weather Management Plan
- SSO Emergency Response Plan
- Coordination with Localities
- Public Participation
- Reporting Requirements

The requirements of the Federal Consent Decree are similar in nature to the requirements of the State Special Order by Consent.

The P3 of HRSD's Water Quality Department oversees the military facilities in the Hampton Roads area. These large bases have sewerage collection systems with the potential of contributing I/I to the system. Because these bases are considered industrial, P3 controls what is discharged. P3 is currently managing administrative orders that have been issued to the bases to have them perform SSES or flow studies of their systems and develop plans to correct any problems identified within their systems.

1.2 Organization

HRSD's structure facilitates the commitment to proper management, operations and maintenance. This section explains HRSD's organization, the role of each component and how Commissioners and staff at all levels of the organization work together to attain the MOM goals.

1.2.1 Governance

HRSD's governance is prescribed by its enabling legislation (§45 of Chapter 66 of the Act of Assembly of 1960 as amended by Chapter 520 of the Acts of Assembly of 1964), which was passed by the Virginia General Assembly. The HRSD Commission, an eight-member board appointed by the Governor of Virginia, provides direction and ensures public accountability. The Commission meets monthly to set policy, approve expenditures and decide budget matters. The Commission is also responsible for selecting the general manager and supervising the performance of this individual. Commissioners, who must reside in the various Localities in HRSD's service area, are appointed for 4-year terms and may be reappointed. The Commission elects a chair and a vice-chair annually.

1.2.2 Continual Improvement Management Framework

HRSD's management philosophy is based upon quality improvement principles and the recognition that a motivated, knowledgeable and skilled workforce is vital to success. HRSD implemented a Quality Program in the early 1990's, focused on training a cadre of facilitators capable of conducting training as well as facilitating quality improvement processes. Quality Improvement training is now delivered in three main modules. Leaders and potential future leaders are trained in quality principles through the Leadership and Management Program (LAMP).

The executive management team at HRSD is referred to as the Quality Steering Team (QST). The QST is comprised of the department directors, some key division chiefs and the general manager. The QST establishes objectives, sets policy and provides broad guidance to the organization. Through this team approach, the QST focuses on cross-departmental issues, ensuring HRSD resources are deployed in the most cost effective manner. In addition, multi-department-level QSTs guide improvements within specific departments.

The QST also guides HRSD's Quality Improvement Program. Three facilitator groups (Quality, Roadmap, and Workplace) comprised of trained facilitators from each department work together as *ad hoc* teams to further the advancement of quality.

Quality facilitators from each department act as internal consultants to assist the organization in implementing and maintaining the strategic planning process with a focus on the annual business plan. The facilitators are trainers and change agents. They assist the QST in developing and deploying the annual business plan to all parts of the organization.

Roadmap facilitators work to implement problem-solving teams. The facilitators train employees on the *Roadmap Process to Problem Solving*; work with management, team leaders and members to assist with problems associated with teams, facilitate meetings as necessary and evaluate the team process.

Workplace facilitators, representing each department, train employees on Quality Improvement principles, and direct employees to sources of assistance in quality improvement matters.

1.2.2.1 Strategic Planning Process

HRSD uses strategic planning principles to guide the direction of business over the long term. A strategic planning steering committee has been appointed by the QST to develop and monitor the strategic plan. The planning process starts with an environmental scan that includes gathering input from the Commission, conducting stakeholder interviews and internal SWOT (strength, weakness, opportunity and threat) analysis of all elements of the organization. Focus groups are used for additional input as appropriate. This data is analyzed by the strategic planning steering committee, identifying areas critical to HRSD's success in the future. Broad strategic objectives are established which serve as the bases for organizational action and guides for development of the annual business plan. The results of this analysis are drafted and presented to the Commission for concurrence and adoption. The strategic planning steering team reviews the strategic plan regularly and makes revisions as required to meet changing internal or external influences.

1.2.2.2 Annual Business Plan

The Annual Business Plan outlines the steps needed to execute the Strategic Plan. Departments hold facilitated meetings with all HRSD employees to review the previous year's accomplishments, review progress toward longer term objectives, identify new specific goals and objectives aligned with the strategic plan and come to consensus on a plan of action for the coming year. The plan of action is memorialized in the Annual Business Plan with the appropriate metrics.

1.2.2.3 Capital Improvement Program

The Capital Improvement Program (CIP) establishes a prioritized annual capital budget with details for planned projects over a 10-year time frame. Projects in the CIP are typically large construction projects greater than $100,000 resulting in the addition of assets of a relatively permanent nature such as property, structures, pipes, plants and equipment. Projects can originate from many sources including the Strategic Plan, the Annual Business Plan, needs defined by the Operations Departments or in response to an emergency situation or unique opportunity. The first year of the CIP is approved by the Commission as the annual capital budget.

The CIP is not an approval or appropriation of funds for individual projects. There is no authorization or funding for individual projects until the Commission acts on the specific project. The Commission formally authorizes individual projects through their approval and appropriation of funds for engineering agreements, construction contracts or other project-related activities.

1.2.3 Organizational Charts

Organizational charts are updated periodically when changes are made to staff. The most current staffing structures appear in Appendix A.

1.2.4 Staffing

HRSD has 767 approved positions in the 2010 budget. The individuals who fill them perform a variety of duties essential to the organization's mission. The Human Resources Division maintains current job descriptions for all positions. The job descriptions define the nature of the work to be performed, provide common examples of the type of work and outline minimum requirements for the position, necessary qualifications or certifications and licenses that may be required.

HRSD has a low employee turnover rate of about 8 percent (including retirements). This means HRSD has a highly experienced staff.

1.2.5 Department Descriptions

Under the **Office of the General Manager**, HRSD has five major departments: Engineering, Finance, Information Services, Operations and Water Quality. These departments operate as cohesive teams, using assets and resources in the most effective manner possible. The Special Assistant for Compliance Assurance in the Office of the General Manager is responsible for coordinating the MOM Program across HRSD. This facilitates attainment of the MOM goals. Under each department is a series of divisions aligned to functional responsibilities or physical facilities.

The **Operations Department**, HRSD's largest department, is responsible for operating and maintaining all of HRSD's treatment plants, pump stations, pipelines, buildings and equipment. This department is also responsible for employee safety, as well as compliance with all environmental regulations and permits. The seven divisions that comprise the Operations Department are:

- Facility Support Division;
- Interceptor Division-North Shore;
- Interceptor Division-South Shore;
- Small Communities Division;
- Special Projects Division;
- Treatment Division -North Shore; and
- Treatment Division-South Shore.

Additionally, the Safety Section is managed by the Chief of South Shore Treatment.

The **Engineering** Department is responsible for facility design and construction, real estate, planning and analysis. There are three divisions under the department: Design and Construction (North Shore and South Shore) and the Planning and Analysis Division.

The **Water Quality** Department ensures that water discharged by industries and businesses into the treatment systems and the treated wastewater that is returned to the environment is safe and clean. The department is made up of three divisions: the Technical Services Division, the P3 Division and the Central Environmental Laboratory Division.

The **Finance Department** includes the Finance and Accounting Division, Internal Audit Division and Procurement Division.

The **Information Services Department** consists of the Customer Information Service Division and the Information Technology Division.

More detailed information on each Department can be found in the next Section (1.2.6).

1.2.6 Office of the General Manager

The general manager provides leadership for the organization and supervises the department directors, Chief of Communications, Chief of Human Resources, Commission Secretary and the Special Assistant for Compliance Assurance.

1.2.6.1 Communications Division

The Communications Division supports HRSD's mission through communications, community outreach and education programs.

1.2.6.2 Human Resources Division

The Human Resources Division maintains employee records, handles employee recruiting and orientation and administers the employee benefits program. In addition, this division reviews job classifications, provides administrative oversight and support for the apprenticeship program, manages Worker's Compensation and oversees employee policy administration.

1.2.6.3 Special Assistant for Compliance Assurance

The Special Assistant for Compliance Assurance works closely with representatives from the Localities, DEQ and EPA to ensure appropriate and timely adherence to the requirements of regulatory enforcement actions.

1.2.7 Finance Department

The Finance Department manages the financial aspects of HRSD's business through three divisions: Accounting, Procurement and Internal Audit.

1.2.7.1 Accounting Division

The Accounting Division is responsible for reporting financial results in compliance with accounting principles generally accepted in the United States, performing the treasury function, preparing the operating budget, selling debt, and performing the payroll, accounts payable and risk management functions.

1.2.7.2 Procurement Division

The Procurement Division sets procurement policy and manages the purchase of equipment, supplies and services in compliance with state statutes. The Procurement Division also administers the sale and disposition of surplus property.

1.2.7.3 Internal Audit Division

The Internal Audit Division is responsible for auditing and reviewing HRSD's internal controls and major operational functions. The auditor determines the annual audit schedule using a "risk-based" audit approach and makes recommendations to management for improvements.

1.2.8 Engineering Department

The Engineering Department is responsible for HRSD facility design and construction, real estate and planning and analysis.

1.2.8.1 Design and Construction Division

The Design and Construction Division works with consultants and contractors to ensure that work is performed consistent with HRSD's quality standards, fiscal policies and environmental commitment. The Director of Engineering has procurement authority and oversees the selection of all engineering design work and contractors to construct HRSD facilities. The Engineering Design and Construction Division has three documents that guide and detail its procedures: *Engineering Project Guidelines Manual, Standards and Preferences for Engineered Construction Projects*, and Section III of *The HRSD Procurement Manual*, which outlines procurement authority and is in accordance with Virginia procurement law. All three of these manuals are in printed form and are also available on the HRSD Intranet.

The division staff members are deployed geographically for projects within the North Shore and South Shore systems and include a division chief for each shore.

Generally, when a CIP project is initiated, employees from the Operations Department are involved in both the engineer selection and the design review process. Depending on the project size, other involved parties may include a representative from the DEQ and a representative from the locality where the construction will take place. This enables stakeholders to become familiar with all aspects of the design and have a better understanding of the project as they review the plans and specifications for permit approvals.

HRSD construction and rehabilitation projects are normally supervised and inspected through a contractual arrangement with the design engineer, but smaller projects are often inspected by in-house staff. As part of the plans and specifications for new projects, strict procedures for testing the facilities are implemented and overseen by the design engineer, engineering staff project manager, and inspector. As stated in *Standards and Preferences for Engineered Construction Projects*, HRSD operates and maintains an interceptor system and the Localities operate and maintain their own collection systems (except for the small system on the Middle Peninsula). Due to this arrangement, it is very rare that HRSD is involved in the construction of new manholes or gravity lines.

Once projects are completed by the Engineering Department, appropriate documentation is maintained in the Geographic Information System (GIS) Division. This information is accessible through the Intranet and is incorporated into the GIS as necessary. The Engineering Department oversees any warranties on equipment or construction for the period stated in the construction documents.

The Engineering Department transmits shop drawings at the close of pipeline and pump station projects to the Interceptor Division. Shop drawings for treatment plant projects are maintained by Engineering for the Treatment Division as an archival record.

1.2.8.2 Real Estate

HRSD has a real estate manager who is a certified Right-of-Way Agent. The HRSD Real Estate Manager negotiates the acquisition of easements and the purchase of real property needed for pipelines, pump stations, treatment plants and other facilities. The Real Estate Manager also works with property owners during or after construction to resolve any problems.

HRSD normally obtains an independent appraisal by a Member of the Appraisal Institute to establish the value of a property, presents an offer to the landowner when attempting to purchase easements or real property, then negotiates the actual price. Consideration is given to such things as crop damage, removal of fences and damage to landscaping. All sales or purchases of property must be approved by the HRSD Commission. Standard easement documentation is used to ensure HRSD obtains the specific rights needed. HRSD's contracted attorney prepares the actual deed and the appropriate records.

In instances where property owners refuse to respond to a request for an easement or are unreasonable in their demands, as a last resort HRSD can condemn the property. A "take" is filed and the appraised value is recorded with the court. Then HRSD has the right to obtain the property. A court action uses a citizen's panel to hear the case and decide on the value of the property that both parties must agree to.

The deeds and plats are incorporated into a database that is available on HRSD Intranet. All deed information will be placed into the GIS system, providing rapid access to easement ownership records and expediting any necessary line work.

1.2.8.3 Planning and Analysis Division

The Chief of Planning and Analysis, supported by a Planner, is responsible for GIS, hydraulic analysis and data analysis, and long-range planning and coordination with the Localities HRSD serves. Some of the primary planning duties include managing HRSD's CIP and updating the Hurricane Readiness and Recovery Plan.

1.2.8.3.1 GIS/CAD

The GIS/CAD Section is responsible for implementing and maintaining an extensive GIS. The GIS contains asset information about the interceptor system that is used for the Computerized Maintenance Management System (CMMS), Regional Hydraulic Model and CIP. This information includes year built, type of material, diameter, installation date, information about manholes and dates when there were problems or when maintenance was performed. An extensive numbering system that identifies all the different facets of the HRSD system is currently in place. As new facilities are added, the GIS will be updated to reflect the changes.

The *HRSD GIS Manual* documents the efforts associated with GIS development. The manual also describes the status of GIS efforts at all jurisdictions served by HRSD, as well as at public organizations that share their GIS products with HRSD and vice versa. Some of these organizations include the Virginia Department of Transportation, DEQ and the Hampton Roads Planning District Commission.

The GIS/CAD section also maintains record drawings for HRSD's infrastructure. Electronic copies are accessible through the Intranet and by request. Field crews are being equipped with laptop computers and are able to download record drawings in the field as they are working on projects.

1.2.8.3.2 Hydraulic Analysis

The Hydraulic Analysis Section is led by two Hydraulic Analysis Managers. HRSD is developing a new regional hydraulic model using DHI's MIKE URBAN software. When developed, this model will provide a dynamic tool that will be used to evaluate system capacity, perform facility sizing, and make operational decisions such as flow routing.

1.2.8.3.3 Data Analysis

The Data Analysis Section collects and analyzes system performance data. This includes pressure and flow measurements as well as operating information such as pump run times. This section also reviews any SSOs which occur and provides input to follow up and resolution activities.

1.2.9 Operations Department

The **Operations Department**, HRSD's largest department, is responsible for operating and maintaining all of HRSD's treatment plants, pump stations, pipelines, buildings and equipment. This department is also responsible for employee safety and compliance with all environmental regulations and permits. The seven divisions that comprise the Operations Department are detailed below.

1.2.9.1 Safety Section

The Safety Section is responsible for the overall safety program of all HRSD departments. The section consists of a Safety Manager, Industrial Hygienists, and a Training Coordinator. They perform routine safety inspections and develop programs to assist HRSD facilities and workers in meeting safety requirements. The staff investigates accidents, near misses and safety complaints reported by the employees. This section also performs testing and inspection of safety equipment. They provide many levels of training to employees on safety, health and first aid. The Safety staff oversees the security of all facilities and the overall disaster preparedness efforts.

1.2.9.2 Treatment Division

The Treatment Divisions (North Shore, South Shore and Small Communities) are responsible for operation and maintenance of HRSD's 13 treatment plants (nine on North and South Shores and four on the Middle Peninsula), discharge permit compliance and solids utilization. The treatment process is highly complex and involves physical, biological and chemical processes. The plants are aligned in the organization geographically and there are division chiefs for South Shore Treatment, North Shore Treatment and the Middle Peninsula (Small Communities).

Each plant has its own manager and is operated as part of an overall system. The managers' work includes not only the day-to-day treatment of wastewater, but also rapid response to problems that may occur. Long-term project management and process planning are additional duties.

1.2.9.3 Interceptor Systems Division

The HRSD Interceptor Systems Division is divided into two components; North Shore Operations and South Shore Operations. The North Shore and South Shore Operations are responsible for operation and maintenance of pump stations and interceptors in their respective geographical locations and each is managed by a Chief of Interceptors. Each chief is supported by interceptor engineers and engineering assistants as well as operations and maintenance staff.

The Division is responsible for planning, operating and maintaining 500 miles of pipelines and 81 pump stations that convey wastewater from the locality-operated collection systems to an HRSD treatment plant. The Division provides day-to-day monitoring and response to problems to minimize or prevent leaks and overflows. The Division also provides preventive maintenance, interceptor inspections, replacements and renovations.

The Interceptor Engineers are responsible for evaluating connection requests to the HRSD system and locating those connections. They also review flow acceptance requests and generate the flow acceptance letters. In doing this, they utilize a hydraulic model to evaluate the system and provide pressure and flow information required by design engineers. Interceptor Engineers evaluate design plans and conduct performance inspections to ensure compliance with HRSD's standards and policies. Interceptor Engineers evaluate possible flow diversions and notify appropriate parties if implemented. Based on operational experience, Interceptor Engineers aid the CIP process by identifying projects from system needs and reviewing system impacts for CIP coordination. Interceptor Engineers also provide engineering support to operating personnel.

The Maintenance crews perform the heavy pump station and interceptor maintenance repairs and projects. This group has the heavy equipment and resources to make repairs to the pump stations, force mains and gravity lines. A spare parts inventory is maintained that consists of pipe and pump parts necessary to keep the system operating. Emergency contingency plans are in place to react to situations that may arise and crews are available to respond day or night. This group keeps maintenance records of all work performed. They receive alarms from the SCADA system and respond as necessary to correct those situations. Crews respond to customer inquiries to determine if complaints are related to problems within the interceptor system.

Pump Station crews perform the preventive and routine maintenance of the pump stations. Pump station crews also look at the feedback from the SCADA system to determine whether the pump stations are working properly. They keep track of the set points for operation of the pumps and maintain the pressure reducing station settings. Odor control systems are monitored and maintained, and wet wells cleaned periodically. The pump station crews test emergency power and ensure that any other parameters required for operation during a hurricane are in place and functioning properly before the hurricane hits.

The third functional group is the Interceptor Crews. These crews oversee the actual operation and maintenance of the force mains, gravity system and odor control systems. These crews maintain and operate valves, air vents and other mechanical devices in the systems. The location of valves in the system is tracked through valve guides. Air vents are operated regularly to vent gases that accumulate in the interceptors.

Repair reports identify where, when, and what type of repair was made. This group also maintains HRSD right-of-ways and easements through mowing and brush clearing.

1.2.9.4 Facility Support Division

The Facility Support Division is comprised of the Automotive Shop, the Carpenter Shop, the Electrical Shop, the Instrumentation Shop, the Machine Shop and Physical Plant Maintenance (PPM). The Division provides services to all of HRSD's facilities including the treatment plants, pump stations and administrative areas.

1.2.9.5 Small Communities Division

The Small Communities Division (responsible for four small treatment plants, 23 pump stations, gravity main, and force main) is part of the Operations Department. Detailed information about each plant is provided in Section 1.1.4.2.

1.2.9.6 Special Projects Division

The Special Projects Division was created to provide support (development, testing, evaluation, piloting, planning and implementation) of new initiatives to improve the effectiveness and efficiency of HRSD operations. This division is responsible for coordinating HRSD research and development efforts with national professional organizations, environmental organizations, other wastewater agencies and industry partners, as well as local and national universities.

One of the special projects is the HRSD's Atlantic and York River Wastewater Treatment Plant (WWTP) that treats wastewater for reuse by industry. Treatment levels are determined based on reuse customer demand. Currently, the York River WWTP provides additional treatment for reuse wastewater, while Atlantic WWTP wastewater does not receive extra treatment for reuse purposes. Potential customers for water reuse include local industries, government facilities and jurisdictions.

1.2.10 Water Quality Department

The Water Quality Department provides support services to monitor and evaluate water discharged by industries and businesses into the treatment systems and ensures that the treated wastewater returned to the environment is safe and clean. This department also helps HRSD comply with environmental permits and leads regulatory advocacy efforts.

1.2.10.1 Laboratory Division

The Laboratory Division is responsible for all HRSD analytical testing and provides quality laboratory tests for internal analysis and regulatory control. The state-of-the-art Central Environmental Laboratory uses the latest technology to monitor treatment processes, industrial discharges into the system and the condition of local waterways.

To offer high quality, legally defensible data, the Central Environmental Laboratory (CEL) maintains a quality assurance program and uses methods and procedures in compliance with state and/or federal regulations and guidelines. The CEL also supports Localities by providing comprehensive analytical services, quality assurance evaluations and consultation on analytical methods and data interpretation through HRSD's Municipal Assistance program.

1.2.10.2 Pretreatment & Pollution Prevention Division

The P3 Division works with all industries in the region, as well as military facilities, to limit discharge of industrial waste and high levels of I/I to the HRSD interceptor system. P3 monitors the waste discharge through regular sampling and surcharge surveys. P3 has the authority to bill customers for high strength discharge which is beyond typical domestic waste that is delivered to the HRSD's system. P3 works closely with these different industries and helps them, to the extent possible, to improve the quality of their pretreatment processes. P3 also works with all the military bases in the area and currently has a program to issue administrative orders to the large bases requiring them to perform SSES or flow studies to determine if their systems are in a state of repair that may be introducing high levels of I/I to the sewer system.

The P3 Division also manages HRSD's Fats, Oils and Grease (FOG) Program. This program includes inspection, enforcement, education, outreach and coordination with Localities. The FOG program is further detailed in Section 4.4.

1.2.10.3 Technical Services

The Technical Services Division is responsible for environmental testing, data analysis, regulatory negotiation, reporting and administration of air and water permits, management of local storm water support programs and performs special studies to support operations. The Division has watercraft from which they can monitor receiving waters to determine the effects of discharges from HRSD facilities on the local waterways.

HRSD's Municipal Assistance Program is designed to provide local municipalities and agencies with access to the technical and scientific resources available at HRSD. The program offers a variety of services, including consultation on water quality and permit compliance issues, as well as providing monitoring and analysis assistance.

1.2.11 Information Services Department

1.2.11.1 Customer Information Services Division

The Customer Information Services (CIS) Division is responsible for sending bills, posting payments and responding to ratepayers' questions. The Division is responsible for the billing and collection of wastewater treatment and transportation charges related to approximately 468,000 customer accounts. HRSD's customer accounts are established and maintained based on the water and sewer connection information provided by the seventeen cities, towns and counties within HRSD's 3,100 square mile service area. The periodic billing of wastewater treatment charges is based on the metered water consumption information provided by the nineteen public and private water purveyors serving the citizens of these cities, towns and counties.

HRSD offers municipalities a billing service, which provides bill printing and payment processing at no cost to participating municipalities. Instead of receiving multiple bills, customers receive one bill. This service is called Hampton Roads Utility Billing (HRUBS).

1.2.11.2 Information Technology Division

The Information Technology Division is responsible for information systems management and provides maintenance and operation of HRSD's wide area network, local area network, information management systems, telephone systems, software support and support services for mid-tier and personal computer platforms. The division also has staff capable of writing computer programs for many of the automated systems utilized within HRSD.

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2. OPERATIONS & MAINTENANCE PROGRAMS

2.1 Sanitary Sewer Overflow Response, Reporting and Recordkeeping Program

2.1.1 Program Definition and Purpose

The purpose of the SSO Response, Reporting and Recordkeeping Program is to prevent or reduce the environmental or public health impact of SSOs by providing structured guidance for release response, compliant reporting of SSOs and accurate recordkeeping of SSOs. The Consent Decree defines two relevant terms to this program as follows:

> "Sanitary Sewer Overflow or SSO shall mean an overflow, spill, diversion or release of wastewater from or caused by the Regional Sanitary Sewer System. This term shall include: (i) discharges to waters of the State or United States from the Regional Sanitary Sewer System and (ii) any release of wastewater from the Regional Sanitary Sewer System to public or private property that does not reach waters of the United States or State, including Building/Private Property Backups."
>
> "Sanitary Sewer Discharge or SSD shall mean any discharge to the waters of the State or the United States from the HRSD Sanitary Sewer System through a point source not authorized in any permit."

HRSD responds, reports and keeps records on SSOs and SSDs from its system. The Localities have the responsibility under State law to respond, report and keep records on releases from their sanitary sewer systems.

HRSD's current plan for response, reporting and recordkeeping related to conveyance system SSOs is included in Appendix D.

In addition, HRSD has established procedures for response, reporting and recordkeeping of releases of untreated or partially treated wastewater at the sewage treatment plants (STPs). Section 2.13 documents the Response Plans for the STPs which include releases at the plant. In general, these releases, where required, are reported under the requirements of the facility's VPDES permit.

2.1.2 Goals and Performance Measures

The goals of HRSD's SSO Response, Reporting and Recordkeeping program are to:

- Ensure the welfare and safety of the public and the environment;
- Provide a protocol for responding, tracking, documenting and resolving each event; and
- Meet regulatory reporting and recordkeeping requirements.

Goals		Performance Measures	Target Value
SSO Response	Ensure the welfare and safety of the public and the environment by responding as soon as possible to Sanitary Sewer Overflows.	Respond within 2 hours. (No. of SSO responses meeting goal / No. of SSO events per year) (%)	100%
SSO Release Reporting	Meet initial regulatory reporting requirements of the DEQ for SSDs.	Provide an initial notice within 24 hours. (No. of reports meeting requirement / Total No. of reports per year) x 100%	100%
SSO Response Training	Ensure all personnel whose duties require SSO Response, Reporting, and Recordkeeping are properly trained.	Provide training to all involved personnel. (No. of employees trained annually /No. of employees involved) x100%	100%
SSO Mapping	Ensure all SSDs are input into GIS. Include all SSDs reported through Sanitary Sewer Overflow Reporting System (SSORS) in GIS system for tracking and analysis.	(No. of SSDs added to GIS per year/Total # of SSDs reported to SSORS) x 100%	100%

2.1.3 Program Description and Components

The SSO Response, Reporting and Recordkeeping Program establishes the procedures for responding to a Collection System Release (CSR) and providing notification which are described in detail in the CSR RP. The CSR RP is updated as required and can be accessed electronically through the HRSD's Sharepoint site. The plan provides structured guidance on addressing releases (including response protocol and flow retrieval, abatement, and clean up techniques), regulatory agency notification (including reporting procedures during normal and non-business hours), training, and reporting of non-HRSD releases. The plan also provides a list of available equipment for release response and a comprehensive phone directory. Procedures on addressing releases/backups in a locality as a result of HRSD's sanitary sewer system are also described in the CSR RP and include:

- Release response and evaluation;
- Actions to limit the exposure of the release to the public and environment;
- Actions to correct the source of the release in the HRSD system; and
- Evaluation of responsibility for the release.

Should a release in a Locality system be attributed to HRSD's sanitary system, HRSD will work in conjunction with the Locality to mitigate the impacts of the release and participate in ongoing review of problem areas.

SSD occurrences are tracked and documented in the on-line notification and reporting system called Sanitary Sewer Overflow Reporting System (SSORS), as well as the HRSD GIS. Priority for additional maintenance or condition assessment is given where recurring problems have been documented.

The Regulatory Reporting Manual and the CSR RP, both kept internally on HRSD's Sharepoint site, provide detailed protocol to address tracking and evaluation of releases at WWTPs. WWTP-related releases are not entered in the SSORS but are manually recorded and reported to DEQ under the VPDES permit.

The main objectives of personnel responding to a wastewater release are to eliminate, contain, recover, disinfect, assess, restore and report properly. These objectives are described by the following:

- Stop: First priority is to stop the release.
- Contain: In order to limit the area of impact, field personnel will contain the release as much as possible. This can be accomplished with straw bales, earthen berms, booms, etc.
- Recover: Attempt to recover as much of the release as possible using vacuum trucks, pumps, etc.
- Disinfect: After the spill has been contained and recovered, the area of impact should be disinfected with lime if appropriate.
- Assess: Field personnel will assess the amount of spill that was recovered and how much was released for reporting purposes.
- Restore: The site should be restored to its original state to the maximum extent feasible.
- Report: The reportable release amount must be reported to DEQ.

From a regulatory compliance standpoint, a critical function of the response team is to consistently and properly report a spill to DEQ. If a responder is uncertain as to whether a release is reportable, he or she will err on the side of caution and report it. Below are some definitions frequently used within the SSO Response, Reporting, and Recordkeeping Program:

- Release: any discharge or spill of wastewater from the sanitary sewer system.
- Reportable release: any discharge or spill that is not contained and returned to the sanitary sewer system. It can reasonably be expected to reach State waters and/or impact public health. An example of a reportable release is a force main leak that enters the storm drain system. Reportable releases must be reported to DEQ as soon as possible but no more than 24 hours from discovery of the problem. A written report must be submitted to DEQ within 5 days of the problem. HRSD uses SSORS for all reporting requirements.
- Controlled release: a discharge or spill that is contained and returned to the sanitary sewer system. It does not enter State waters nor does it pose a threat to public health. A controlled release does not need to be reported to DEQ. Non-reportable discharges or spills such as controlled releases are tracked.

2.1.4 Training

HRSD personnel that have the responsibility of responding to a CSR or involvement with CSR reporting will receive training on an annual basis. The training will be targeted to the involvement of the group. For instance, responders will receive training on response, containment, clean up and reporting. Persons involved in reporting and recordkeeping will receive training in those topics. Additional topics include follow-up and resolution.

2.1.5 Information Management

HRSD and all the Localities in Hampton Roads worked jointly with the Hampton Roads Planning District Commission (HRPDC) and the DEQ to develop and implement the Internet-based SSORS.

HRSD operators in the field alert the Permits Manager of any SSDs that have occurred and the Permits Manager sends the information to DEQ via the SSORS database email. Upon their receipt of the e-mail, DEQ assigns the event a reporting number. HRSD then has 5 days to submit a final report utilizing SSORS.

This system allows the reporting entity to define what happened and receive a case number from DEQ. Then a follow up report, clearly defining the incident and the resolution, is filed within 5 days. When the report is filed, copies are sent to everyone on the regulatory distribution list. HRSD can review all reports including Locality reports; each Locality can view their own reports and reports of any HRSD incidents that occurred within their locality. A database is maintained that contains the history of the spills. Procedures to use the SSORS system are further defined in the CSR RP.

2.1.6 Resource Management

There are approximately 124 full-time employees (FTEs) assigned to the SSO Response, Reporting, and Recordkeeping Program during normal business hours as partial duty. For more information refer to the Operations Organizational Charts located in Appendix A. Page A-6 through A-20. The Chief of Interceptor Operations North Shore and the Chief of Interceptor Operations South Shore are responsible for managing this program.

During non-business hours:

- For North Shore Personnel: Duty crews comprised of seven employees are designated as first responders for SCADA alarms and emergency contact (via text messaging).
- For South Shore Personnel: Duty crews comprised of five employees are designated as first responders for SCADA alarms and emergency contact (via text messaging).

In an emergency situation, HRSD can initiate special procurement or contractual processes to access additional resources from outside contractors or other nearby utilities as needed.

2.1.7 Process for Continuous Improvement

The SSO Response, Reporting, and Recordkeeping Program and the CSR RP document will be evaluated and revised, if necessary, annually. The Special Assistant for Compliance Assurance is responsible for conducting the evaluation and developing revisions, if necessary.

2.1.8 Implementation Plan

Program Milestone	Time Frame
Evaluate and Update SSO Response Plan (SSO RP)	Annually Upon Approval

2.2 Infiltration and Inflow Abatement Program

2.2.1 Program Definition and Purpose

The purpose of the I/I Program is to identify and reduce or eliminate, as practical, sources of unpolluted water entering HRSD's sanitary sewer collection system. HRSD monitors the flows in the sanitary sewer collection system through the Flow, Pressure and Rainfall (FPR) Monitoring Program and through temporary metering in areas of suspected concerns. In addition, wet weather related overflows are tracked to identify areas of the system that may experience high levels of I/I. Where these conditions exist, HRSD works with the owner of the collection system (Localities, federal installations, private owners) to reduce I/I and mitigate the impact of SSOs on the public and environment. HRSD has, through its enabling legislation, broad powers to control discharges to the sewer system including I/I. Ultimately, the responsibility to reduce peak flows that result in capacity related overflows is the responsibility of the collection system owner.

HRSD also reviews potential I/I sources within its own gravity system. The primary means of identifying these sources is CCTV inspection, review of pump station records and flow monitoring results. Where I/I into HRSD's system is determined to be significant based on findings from condition assessment inspections, HRSD will schedule rehabilitation work to mitigate the I/I. Documented defects with a NASSCO PACP rating of 4 and 5 will be deemed significant. For example, defects coded as 4 or 5 may include infiltration runner and gushers as well as large intruding roots, intruding tap break-ins or holes. HRSD acknowledges that potential I/I sources can extend beyond the gravity system and will evaluate additional sources such as pump station wet wells and treatment plant drainage sites. Periodic observations of plant drains at STPs will be conducted to identify I/I sources. If significant I/I sources are identified at pump stations or STPs, remedial measures will be implemented to reduce/eliminate these sources.

To avoid confusion, the various terms used to describe water in the sewerage system are defined as follows:

- Water Consumption: The volume of water in the sewerage system equal to the amount of potable water used, which is measured by potable water meters (corrected for any known additional or deductible flows such as irrigation or other consumptive losses), or in a few instances, estimates of potable water consumption or metered discharge.
- Infiltration: Water entering the sewerage system from such sources as defective sewer pipe joints and connections, cracked pipes or defective manhole walls and other sources of leaks into the system.
- Inflow: Water entering the system from such sources as roof drains, basement drains, yard and area drains, direct connections from storm sewers, flow through manhole covers, and other sources directly connecting storm water flow to the sewerage system.
- Wastewater: The sum of water consumption, infiltration and inflow.
- Average Daily Water Consumption: The amount of water consumption that would normally be expected in a 24-hour period.
- Overloaded System: An interceptor, or pump station or plant that is subject to flows in excess of pump design capacity.

2.2.2 Goals and Performance Measures

Goals	Performance Measures	Target Value
Identify and mitigate significant sources of I/I into the HRSD gravity system.	Schedule rehabilitation to address significant levels of I/I in the HRSD gravity system	Complete rehabilitation of significant I/I sources in the HRSD gravity system within 5 years of discovery.

2.2.3 Program Description/Components

HRSD and 13 Localities are parties to the Special Order by Consent (SOC) with DEQ. The SOC requires that all parties assess their systems for I/I and identify service areas that meet one or more of the following criteria:

- Basins with unresolved wet weather related SSOs, except where the SSOs have only resulted during rainfall conditions in excess of a 10-year, 24-hour rainfall recurrence interval;
- Basins with unresolved SSOs caused by infrastructure defects;
- Basins exceeding an actual peak flow of 775 gallons per day per equivalent residential unit plus three times commercial water consumption plus major industrial flows, where this peak flow is estimated to occur during rainfall conditions up to a 10-year, 24-hour rainfall recurrence interval; and
- Basins served by pump stations that exhibit excessive pump run time.

HRSD is working closely with Localities in the development of SSES Plans to address areas that meet one or more of these criteria. After SSES investigations, Localities are required by the SOC to prepare a rehabilitation plan that determines whether rehabilitation will be effective to reduce peak flows down to the peak flow threshold value. If any Locality determines that it is not feasible or cost effective to reduce peak flows to the threshold, that Locality must commit to some level of reduction and refer the larger flow in excess of the threshold to the Regional Wet Weather Management Plan (RWWMP). This process will be highly collaborative between all parties to the SOC.

I/I occurs when groundwater or rainwater enters the sewer lines through cracks, breaks and/or areas not intended to drain to the sewer system, increasing peak flows and consuming sanitary system capacity, which may result in SSOs. The I/I Abatement Program utilizes several methods to identify the sources of clean water entering HRSD's sanitary sewer collection system.

2.2.3.1 Data Analysis

HRSD utilizes data from wet weather related overflow tracking and HRSD Telog server flow data to identify areas within the system that appear to I/I due to rainfall events.

HRSD maintains a network of shallow wells, typically located at various pump station sites throughout the HRSD service area. HRSD also maintains various spare shallow wells for critical replacement. The complete listed of shallow wells maintained by HRSD is updated in the CMMS. The bottom of each well is located below the invert elevation of the influent sewer line at the particular site. The top of the well pipe is enclosed within a standard HRSD air vent casting. The basic purpose of these shallow wells is to monitor the elevation of the ground water table at each site. This can provide a correlation between the rates of infiltration on the influent gravity system and the elevation of the ground water table in a particular area. The elevation of the ground water table is obtained at each site, quarterly, through the use of a water sensitive measuring device. The Interceptor Division monitors these installations and Instrumentation maintains the monitoring devices.

2.2.3.2 Field Investigations

2.2.3.2.1 Smoke Testing

HRSD may use smoke testing in its system to diagnose problems. Due to the physical nature of HRSD's system, e.g. the predominance of pressure systems, smoke and dye testing have limited applicability. However, there may be occasions where these investigative tools are employed by HRSD to identify sources of I/I or leaks into the system. Smoke testing is one of the most efficient and cost effective methods of locating sources of I/I connected to the sewers, and to evaluate odor issues. The non-toxic smoke serves as a visual tracer to help locate places where storm and other surface waters enter the sanitary sewers. Smoke testing is conducted by placing a blower over a centrally located manhole and forcing the smoke-filled air through a sewer line. The smoke will fill the main line plus any connections, then follow the path of any leaks to the ground's surface, quickly revealing the source of I/I. The smoke will be noticeable wherever there are leaks from a cracked sewer pipe, a broken cleanout cap or a defective or damaged manhole, when a roof drain is connected to the sanitary sewer or when there is a cross connection between a storm sewer and a sanitary sewer.

2.2.3.2.2 Closed Circuit Television (CCTV) Inspection

CCTV inspection is a non-destructive, proactive approach to evaluate the HRSD pipeline infrastructure and is used when observed data is necessary to assess the condition of the pipeline interior. It can be an effective way to locate sources of I/I.

CCTV is used to inspect HRSD gravity pipelines. Operators of the CCTV system are certified in the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification Program (PACP) and use the PACP rating system to identify the severity of the defects found during the inspection process. PACP defect coding provides a level of consistency in the defect rating; therefore, HRSD and others reviewing the inspection records can understand and use the information accordingly.

HRSD's long-term CCTV program has a goal of inspecting gravity pipelines on a 5-year cycle. More information on this topic is included in Section 2.9 of this document.

2.2.3.2.3 Dye Testing

Dye testing is another technique used to trace I/I sources within the sanitary sewer system. Dye is inserted in the suspected I/I sources. Traces of the dye can be seen in the sanitary stream if there is a cross-connection or leak. Dye testing is often used to verify sources that tested positive during smoke testing. Dye testing is most effective in identifying specific sources of I/I if performed in conjunction with CCTV inspection.

2.2.3.3 Resolution Techniques

Sources of I/I shall be addressed by the protocols established in the SSES Plan and Preliminary Condition Assessment Report (PCAR) which was submitted to the DEQ.

In addition, HRSD will also control I/I entering its infrastructure directly through on-going rehabilitation programs using data developed from its on-going CCTV inspection program.

2.2.4 Training

HRSD personnel involved with the I/I Abatement Program are typically trained and certified through the NASSCO Pipeline Assessment & Certification Program/Manhole Assessment & Certification Program (PACP/MACP). Program personnel will also receive on-the-job training as needed.

2.2.5 Information Management

The North Shore and South Shore Interceptor personnel can utilize the HRSD Telog and Emerson Enterprise Data Server (EDS) servers to review and analyze data with respect to the I/I Abatement Program in addition to various related spreadsheets and databases.

Employees involved with CCTV investigations use software such as Granite XP. This is an asset-based software used as a comprehensive data collection and management tool developed by CUES.

Currently for the HRSD P3 Division, all of the I/I Abatement documentation is recorded on hard copies only. These records are stored on the second floor of HRSD's main office.

2.2.6 Resource Management

Although the responsibility of the I/I Abatement program within HRSD spans across several divisions, the overall lead for the program is the Director of Operations. Both North and South Shore Interceptor Operations and the P3 Division provide resources for the program.

There is one North Shore Interceptor crew, comprised of two interceptor technicians, designated as a resource for the I/I Abatement Program. The responsibilities for this crew are split between various I/I Abatement Program efforts including CCTV investigations and flow monitoring activities. There is one South Shore Interceptor crew, composed of an interceptor technician, heavy equipment operator and assistant designated as a resource for the I/I program. The P3 Division currently has 24 full-time employees (FTEs) designated to the I/I Abatement Program as a partial duty.

2.2.7 Process for Continuous Improvement

Continuous improvement for the I/I Abatement Program includes the following:

- HRSD staff will continue to work with collection system owners and develop measures to reduce I/I.
- HRSD is an active participant in the SOC and will continue to work collaboratively with the Localities on I/I reduction.
- HRSD is actively participating in a special committee composed of representatives from Localities, HRSD, consultants and HRPDC to develop a regional Private Property I/I Abatement Program per the requirements of the SOC.

2.2.8 Implementation Plan

Program Milestone	Time Frame
Private Property I/I Abatement Program	Initial development October 31, 2010, implementation thereafter.
Submit Rehabilitation Plan	Under SOC, November 30, 2012
Submit Action Plan	Under the Consent Decree, February 12, 2013

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2.3 Flow, Pressure and Rainfall Monitoring Program

2.3.1 Program Definition and Purpose

HRSD's FPR Monitoring Program was established to collect data of sufficient amount, scope and quality to maintain and manage system performance and reliability as well as to support HRSD's development, calibration and verification of the Regional Hydraulic Model, HRSD's assessment of Sanitary Sewer System capacity, and the development of a Regional Wet Weather Management Plan (RWWMP). The number and location of rainfall, flow and pressure monitors, as well as shallow well sensors are sufficient to allow HRSD to calibrate the specified portions of the Regional Sanitary Sewer System included in the Regional Hydraulic Model. The duration, amount and quality of the monitoring proposed will be adequate to allow the collection of (i) sufficient dry weather data to facilitate adequate dry-weather model calibration and validation activities, and (ii) a sufficient number and appropriate range of wet weather events to facilitate adequate wet-weather model calibration and validation activities.

HRSD has submitted an FPR Monitoring Plan in coordination with Locality Flow Monitoring Plans, such that the Localities' plans and the FPR Monitoring Plan will generate all data needed to develop an appropriate Regional Wet Weather Management Plan. The FPR Monitoring Plan has been approved by EPA and is an attachment to the Consent Decree.

2.3.2 Goals and Performance Measures

The goals of HRSD's FPR Monitoring Program are to:

- Monitor pipeline pressures and flows in HRSD's wastewater collection and transmission system;
- Monitor collection system performance and integrity;
- Provide data to calibrate HRSD's Regional Hydraulic Model;
- Provide data for the RWWMP;
- Provide data for better operating decisions;
- Provide data for site specific capacity analyses; and
- Provide data access for Localities.

Goals		Performance Measures	Target Value
FPR Flow & Pressure Meter Data Quality	Obtain quality flow and pressure data for model calibration and system performance assessment.	Meet the Data Quality Standards in the Data Quality Standards and Procedures (DQSAP).	For each flow and/or pressure meter, 75% reliable data monthly.* For all pressure meters in the aggregate, at least 90% reliable data during the wet weather response during qualifying rain events used for calibration or verification of Regional Hydraulic Model. For all flow meters in the aggregate, at least 90% reliable data during the wet weather response during qualifying rain events used for calibration or verification of Regional Hydraulic Model.
FPR Flow and Pressure Data Quality	Maintain flow and pressure measuring equipment to collect data of sufficient quality to maintain and manage system performance and reliability	Maintain / adjust in-service pressure and flow measurement equipment annually. (No. of procedures performed / No. of procedures required) x 100%	100%
FPR Rainfall Monitoring Equipment	Maintain rainfall measuring equipment to collect data of sufficient quality to accurately capture the data necessary to build a well-calibrated model.	Maintain / adjust in-service rainfall measurement equipment annually. (No. of procedures performed / No. of procedures required) (%)	100%

**Note: A modification to this target value is being discussed with EPA at the time of this submittal.*

2.3.3 Program Description and Components

The FPR Monitoring Plan has been designed to:

- Measure flow rates and total amounts of wastewater flow at significant locations in HRSD's force mains;
- Measure flow rates and hydraulic grade lines (i.e., surcharge) at significant locations in HRSD's gravity sewers;
- Characterize the performance of HRSD's pump stations and pressure reducing stations;
- Measure pressure conditions in HRSD's force mains; and
- Measure rainfall rates and total rainfall amounts so as to adequately characterize spatial and temporal variations in rainfall across the modeled portions of HRSD's service area.

2.3.3.1 Rainfall Monitoring

HRSD maintains a network of 66 recording rain gauges, located at various sites throughout the HRSD service area. The basic purpose of these installations is to correlate rainfall data with wastewater flow responses in the area where they are located.

These gauges are the "tipping bucket" type and are capable of recording rainfall in increments of 0.01 inch. The stored data is transmitted via Telog communications units or may be downloaded directly onto a laptop computer. This equipment is operated and maintained by the Instrumentation staff.

2.3.3.2 Flow Monitoring

HRSD has initiated an FPR Program where meters are installed to enable measurement of flows throughout the system. This information can be used to measure the improvements that are achieved under the rehabilitation programs being undertaken by the Localities. Flow data will also be used to calibrate the hydraulic model.

Additionally, HRSD may utilize various types of portable meters for temporary monitoring in the system's pipelines for the purpose of recording pressure and/or flow data in pipelines. Meters are used in both gravity sewers and force mains, and are frequently installed in pipelines in the Localities, with the Localities' permission. If the data collection requirement for a particular site is for a relatively short period of time, it is simply downloaded at the site onto a laptop computer by Instrumentation staff for later processing and analysis. In other cases where the data requirement is for an extended period of time, the metering site may be equipped with telemetry equipment which allows the transmission of data from the site back to HRSD's Telog server. These sites are operated and maintained by HRSD personnel.

2.3.3.2.1 Open Channel Meters

HRSD owns and maintains, as well as, contracts various open channel flow meters for monitoring flows in gravity sewers. The typical installation is usually at a manhole or pump station wet well in the gravity system. A stainless steel band with an attached sensor is inserted into the end of the pipeline at a manhole. The sensor has a velocity sensor and depth of flow (pressure) sensor to calculate the flow in the pipe. The data is stored and flow is calculated in a data logger unit which is normally suspended just below the manhole cover in a submersion-proof housing. The stored data is transmitted via Telog communications units or may be downloaded directly onto a laptop computer.

2.3.3.2.2 Ultrasonic Flow Meters

Ultrasonic flow meters have become a valuable asset in monitoring system performance. The sensors can be installed on the outside of the pipe because the ultrasonic signal can penetrate most solid materials. The meters work well on most ferrous and polyethylene-based force mains. Ultrasonic flow meters send bursts of signals through the pipe to measure the velocity of the fluid in the pipe.

2.3.3.3 Pressure Monitoring

Pressure recorders are needed to measure the head pressure in force mains to assist in making operational decisions pertaining to the Pressure Reducing Stations (PRS) and optimizing the force main system. Pressure recorders are typically installed on the pressure-piping manifold in a pump station. The recorder consists of a pressure transducer, which transmits its pressure data to one of several types of data storage units. At the typical air vent installation, a special fitting is utilized on the air vent valve that allows continuous monitoring of system pressures. This equipment, along with the data storage unit, is installed within the air vent structure under the cover. The stored data is transmitted via radio frequency or cellular technology to a storage warehouse and may also be downloaded directly onto a laptop computer by Instrumentation staff.

2.3.4 Training

Typically, HRSD staff responsible for data analysis and evaluation duties for the FPR Program is trained on all aspects needed to function in that department. New hire employees are trained through on-the-job experience on equipment used to support their specific activities.

HRSD employees responsible for meter installation, data collection, operations and maintenance duties under the FPR Program typically attend the Apprenticeship Program which is further described in Section 3.2 Training. Instrumentation specialists and electricians attend a 4-year program.

2.3.5 Information Management

There are systems utilized to retrieve, maintain, manage and store data for the FPR Monitoring Program. HRSD is currently implementing a Computerized Maintenance Management System (CMMS) which manages work orders for flow, pressure, and rainfall equipment and stores maintenance and calibration records for the FPR Monitoring Program equipment. All data collected through those assets are transmitted via Telog or similar system. The Telog equipment records the data and periodically transmits the data over a cellular 1x digital network back to HRSD's Telog server.

Each meter is uniquely identified from the other devices and all data is stored with a time and date stamp in an easily accessible open platform control (OPC) compliant format.

The FPR Monitoring Program also utilizes a centralized Emerson EDS for data storage which can be used to obtain interceptor master metering site data through the Telog system, interceptor process data through the SCADA system, and plant operations and maintenance data.

Data analysts are using a software program called Track It to manage the workflow related to reviewing FPR data. This software helps to manage the significant workload associated with data analysis.

2.3.6 Resource Management

There are numerous employees spanning several departments assigned to the FPR Monitoring Program as a partial duty. The majority of responsibility comes from Facilities Support, Operations, and Engineering. Generally, the Data Analysis division of the Engineering Department has primary responsibility for data review and quality. The Instrumentation Shop within Facilities Support has primary responsibility for maintaining and calibrating meters and gauges. Interceptor Operations and/or Facility Support respond to inquiries from Data Quality on suspected meter performance issues and to verify operational changes (diversions, etc) that may impact FPR data. These processes are fully documented in the Data Quality Standards and Procedures (DQSAP). The overall lead for the FPR Program is the Special Assistant for Compliance Assurance.

2.3.7 Process for Continuous Improvement

The FPR monitoring data is evaluated by the Data Analysis division in Engineering Department on a regular basis to ensure that data quality standards meet the established criteria through the FPR Monitoring Plan. HRSD has submitted a DQSAP document that outlines data quality standards and establishes protocols for data screening to identify potential problems or deficiencies with the data.

2.3.8 Implementation Plan

The FPR Implementation plan is fully described in the FPR Monitoring Plan.

Program Milestone	Time Frame
Implementation of Data Quality Standards and Procedures (DQSAP)	Implemented as of March 2010
FPR Monitoring system	Installed and operational by March 2010

2.4 SCADA Program

2.4.1 Program Definition and Purpose

The telemetry system that monitors the activities of the Pump Stations and other components of the collection system is known as Supervisory Control and Data Acquisition (SCADA) and is typically used to monitor system performance and to transmit various types of alarms from the pump stations to a three central locations to alert the staff of a potential problem.

2.4.2 Goals and Performance Measures

The goals of HRSD's SCADA Program are:

- Transmit adequate data to alert staff of system issues to prevent and reduce problems such as SSOs.
- Ensure emergency alarm response per Sewage Collection and Treatment (SCAT) Regulation 9 VAC 25-790-420 Alarm Systems.
- Maintain adequate SCADA system performance and reliability.

Goals		Performance Measures	Target Value
SCADA Performance and Reliability	SCADA system to provide control, data, and alarms to effectively manage monitored systems.	SCADA communication uptime to be compared to total time. [Communication uptime hours / total hours] X 100%.	90% Data Availability

2.4.3 Program Description and Components

The HRSD SCADA system monitors performance and a variety of alarms at pump stations and other HRSD facilities. The SCADA system is also used to monitor security systems at the main buildings. Typical communication is achieved through radio modems at the sites with several repeaters located throughout the service area to facilitate communication from more remote locations.

Additionally, data for the FPR program is being communicated through Telog system. The Telog system utilizes cellular phone communication at approximately 248 sites. Most of the pump stations are fitted with permanent generators or are provided with electrical service through dual feed to maintain operability during power failures. Portable generators are available in the event that service is lost. However, battery backup is available to SCADA systems in the event power is completely lost.

The data from the SCADA system is received at three locations: South Shore Interceptors, South Shore Electrical Shop, and North Shore Interceptors. This configuration provides redundancy to the master control in the event communications are disrupted. The data is transmitted between the various HRSD facilities via a T1 communication line.

Several different types of telemetry installations are used by HRSD to transmit data, including:

- Site data recorder with modem, phone line, and commercial power;
- Site data recorder with modem, phone line, and battery power;
- Site data recorder with modem, cellular phone, battery power, and with one of several types of solar recharging systems; and
- Other telemetry systems may be used in the future as better technology becomes available.

2.4.4 Training

The requirement for Instrumentation staff responsible for maintaining the SCADA is a two year degree in instrumentation or an equivalent field of study. Four years of on-the-job training or equivalent experience is also required. Employees are provided on-the-job training and have the opportunity to shadow a more experienced employee until they become knowledgeable and comfortable working alone. Unique attributes and alarm settings for each pump station are kept on local reference sheets located in each instrumentation cabinet to aid employees while on the job.

2.4.5 Information Management

Incoming SCADA data is analyzed to ensure that the system is reporting quality data. The information received through the SCADA system is stored on HRSD's network server and for a minimum of 5 years. Current and historical trends are used to analyze system performance and to determine if set points need to be modified.

The attributes and set points for the pump station monitoring system are posted on the cabinets at each station and are kept on compact disc for backup. The information is also stored at HRSD's main office on a server.

Hardcopy log books are maintained at each station to describe activities that are undertaken daily by anyone entering the stations.

HRSD is implementing the Computerized Maintenance Management System (CMMS) program in a phased manner which will contain the inventory of system components, spare parts inventory and will provide historical data on asset performance, as well as maintenance history.

2.4.6 Resource Management

The SCADA system is maintained by the Instrumentation staff. The South Shore Instrumentation Supervisor has the primary role in managing the Instrumentation staff and reports to the Chief of Facility Support.

The current staffing provides six South Shore Instrumentation Specialists, four North Shore Instrumentation Specialists, and two data analysts, which are stationed on the South Shore. There is typically one technician on-call at all times for emergencies. On-call staff has Verizon air-cards and laptops for remote access and to increase response time. The staff has access to eight trucks which carry a sufficient inventory of replacement parts so they are readily available when repairs are needed.

The Data Analysts are dedicated to monitoring and maintaining the human interface equipment as well as monitoring data received through the SCADA system.

Purchases of major items are evaluated by the SCADA staff then the request is sent to the Chief of Facility Support for approval. The equipment is procured under the North or South Shore Interceptor System's budget.

2.4.7 Process for Continuous Improvement

The SCADA system is being evaluated with the assistance of outside consultants to identify needed upgrades. New technologies are being evaluated regularly for appropriateness. The preliminary evaluation of system needs is scheduled to be completed by mid-2010. Additionally, the upgraded system will have the flexibility to account for future expansion of the network if additional locations are added.

HRSD is in the process of populating and updating SCADA related equipment information into the CMMS to track usage and assist in maintaining adequate inventory.

2.4.8 Implementation Plan

Program Milestone	Time Frame
Evaluation of upgrades to SCADA system	Preliminary Engineering Report be completed by first quarter FY2011
SCADA related equipment loaded into CMMS.	April 2010

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2.5 Condition Assessment

2.5.1 Program Definition and Purpose

The purpose of this section is to describe the Condition Assessment Program (CAP) for HRSD, including the near term program required by the enforcement action by the EPA and the SSES Plan submitted to the DEQ under the Special Order by Consent (SOC). In addition, this program includes the long term program for conducting condition assessment of HRSD's critical sewer system assets.

HRSD will be conducting condition assessments of assets within its sanitary sewer system for the purpose of locating conditions that present a "material risk of failure". For the purposes of this document, "failure" means conditions resulting in a sanitary sewer overflow, pipe leakage, or interruption of service to HRSD's customers, due to a physical condition defect in the system.

2.5.2 Goals and Performance Measures

The goals of HRSD's CAP are to:

- Develop and execute a CAP and schedule for inspecting, assessing, and prioritizing HRSD's sanitary sewer system assets in order to reduce failures and identify assets in need of repair or replacement.
- Provide standard methods for evaluating the physical condition of HRSD sanitary sewer assets in order to identify assets that present a "material risk of failure."

Performance measures related to Condition Assessment are interrelated to other MOM Sections. Section 2.7.2 has condition assessment performance measures related to Pump Stations; Section 2.8.2 has condition assessment performance measures related to Force Mains; and Section 2.9.2 has condition assessment performance measures related to Gravity Mains.

2.5.3 Program Description/Components

HRSD is performing a systematic inspection of the entire gravity collection system, pump stations and selected portions of the force mains to identify defects that may result in failure of the system. The inspection is being conducted by outside contractors and consultants to augment the HRSD staff.

2.5.3.1 Force Main Interceptors

HRSD is implementing a CAP for force mains. Identified segments of force mains will be subject to inspection using a variety of technologies, which may include acoustic, ultrasonic and/or sonar, employed by specialty contractors. After this initial round of condition assessment activities, HRSD will re-evaluate force mains periodically based on observed conditions, failure histories and other available data. Force mains at material risk of failure will be subjected to further inspection. Where there are actual conditions that present a material risk of failure, HRSD will develop specific rehabilitation and/or replacement plans and associated schedules to address these defects.

HRSD will assess the condition of the interceptor force main (IFM) system via a multifaceted approach. On an annual basis after the initial round of inspections under the SOC and Consent Decree, HRSD will review all IFM failures that occurred over the past year to identify any patterns to the failures. This review will be led by the Special Assistant for Compliance Assurance using an *ad hoc* team that has representatives from Interceptor Operations and Engineering. For each failure that occurs, HRSD will review the condition of the pipe in the vicinity of the failure to determine the conditions that led to the failure. For pipes that have conditions that materially increase the risk of failure (e.g., extensive internal corrosion, etc.), HRSD will either perform additional condition assessment to define the magnitude of the problem or schedule the line for rehabilitation or replacement.

HRSD is developing a hydrogen sulfide monitoring program. Routine venting of gas at established locations is a regular maintenance activity that both improves operations and reduces the potential for buildup of corrosive gases. Venting frequency is based on field conditions and specific experience at that location. The hydrogen sulfide monitoring program will be developed in a phased manner. Initially, a survey of hydrogen sulfide gas concentrations will be conducted to establish a baseline. From this baseline, a routine program of monitoring will be developed and implemented. The force main system will be accessed through existing air vents in order to obtain gas samples for analysis. The frequency and location of sampling will be influenced by pipe material and age and the volume of gas normally vented in that location. The presence of high concentrations of hydrogen sulfide is only an indicator of corrosion potential. Once the CAP program is completed and corrosion potential is evaluated, implementation of the hydrogen sulfide monitoring program can begin. A baseline survey of the hydrogen sulfide levels at selected points throughout the system will be established within 2 years after the CAP is complete. An operational hydrogen sulfide monitoring program will be implemented within 2 years thereafter based on the results of the baseline survey. See Table 2.5.8 for the implementation schedule.

HRSD also conducts condition assessment (such as pipe wall thickness measurements) of the force mains when it is opportunistic, e.g. when the pipe is tapped, when a repair is conducted on the main, or is otherwise accessed internally. Additionally, when a repair is initiated, a portion of the force main is inspected, in both directions, to determine how much pipe needs to be removed to allow for a proper repair and attachment of the new pipe to a sound portion of the main.

In addition, HRSD will develop and maintain a database that captures IFM pipe condition data collected through other means. This will include pipe wall thickness measurements, where feasible, whenever the pipe is tapped (i.e. installation of corporation stops for air relief valves, etc.) or otherwise accessed internally. For pipe that is replaced, representative samples will be collected, analyzed and the results entered into the database to characterize pipe conditions. Trends will be monitored annually for patterns that may indicate certain types of pipes are at increased risk of failure.

For additional information on Force Main Maintenance, see Section 2.8 of this plan.

2.5.3.2 Gravity Interceptors

The gravity system makes up a small percentage of the HRSD system in comparison to force mains; however inspection of gravity mains is performed on a routine basis with a goal of inspecting the entire system on a 5-year cycle. HRSD is currently releasing a contract to inspect the entire gravity system by November of 2011. Identified defects are prioritized and, depending on severity, scheduled for repair.

For additional information on Gravity Interceptors Maintenance, see Section 2.9 of this plan.

2.5.3.3 Pump Stations/Pressure Reducing Station (PRS)

HRSD has an ongoing pump station and PRS inspection program using Interceptor and Facility Support staff. Performance data is transmitted through the SCADA system. There are periodic maintenance checks of the stations during routine visits for preventive maintenance (PM) activities. The frequency of inspections and the items that are assessed are defined in the Interceptor System Preventive Maintenance Manual that is currently under review. Annual calibrations are performed as well as infrared inspection of electrical equipment. As part of the SOC and the Consent Decree, HRSD will be performing a comprehensive condition assessment of all pump stations and PRSs. The results of these assessments will be used to develop rehabilitation plans and repairs scheduled per the Rehabilitation Plan.

For additional information on Pump Station Maintenance, see Section 2.7 of this plan.

2.5.4 Training

HRSD personnel typically performing system routine inspection and preventive maintenance are trained in one of HRSD's nine apprenticeship programs (Plant Operator, Maintenance Operator, Interceptor Technician, Instrument Specialist, Electrician, Equipment Technician Carpenter, Machinist, and Auto Technician). They also receive on-the-job training to become familiar with the unique conditions related to the HRSD systems.

HRSD operators of the CCTV system are certified in the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification Program (PACP) program

The Interceptor System Preventive Maintenance manual is available to the staff to document what specific activities are conducted during inspections.

Procedures on how to perform calibration and maintenance are available to Facility Support staff through CMMS.

2.5.5 Information Management

The information management associated with the condition assessment of HRSD's assets is described in more detail in the CAP. It is located on the HRSD Sharepoint site and is maintained by the Special Assistant for Compliance Assurance.

HRSD is currently developing a database to compile condition data and will be PACP and MACP compliant. CCTV and other inspection data is coded and accessed through Granite XP, and HRSD will continue to populate the database as inspection data is acquired. HRSD is working to link the condition database to the GIS mapping system to provide graphical displays of the condition of HRSD's assets. Additional information will be available through the CMMS upon full implementation of that system.

In addition, HRSD will develop and maintain a database that captures force main pipe condition data collected through other means. This will include pipe wall thickness measurements whenever the pipe is tapped (e.g., installation of corporation stops for air relief valves, etc.) of otherwise accessed internally. For pipe that is replaced, representative samples will be collected, analyzed and the results entered into the database to characterize pipe conditions. Trends will be monitored for patterns that may indicate certain types of pipes are at increased risk of failure.

2.5.6 Resource Management

The Special Assistant for Compliance Assurance is responsible for the Condition Assessment Program and utilizes various consultants and contractors to perform the work. Certain contractors have specialty equipment available to perform inspection of large diameter pipes. These technologies may include acoustic, CCTV, sonar, laser and other accepted methods.

Routine inspection and preventive maintenance of the gravity, force mains, and pump station systems are performed by personnel in the Interceptor Division – North Shore and the Interceptor Division – South Shore. These personnel report to the chief of each of these divisions and these chiefs report to the Director of Operations.

Currently, the North Shore Interceptor has a CCTV truck and conducts inspections of the system as needed. South Shore Interceptor has access to the annual contract to perform CCTV work when it is needed. An "as needed" services contract is being set up to make available additional CCTV inspection services when required.

2.5.7 Process for Continuous Improvement

The following elements have been identified for continuous improvement:

- The Preventive Maintenance Manual will be revisited and evaluated for revisions to update inspection procedures, inspection frequencies and the technologies utilized. The manual will be incorporated into the CMMS in a phased manner which will allow more efficient work order creation and more timely future revisions.
- HRSD will contract to have CCTV services available on an as-needed basis.
- HRSD will investigate interceptor failures to determine the conditions that led to the failure.
- An annual review of any failures will be conducted to determine if any trends can be seen in the failures.
- A database will be developed to store condition information obtained from other sources beyond CCTV information.
- Continued implementation of the CMMS will be used to store appropriate system condition information.
- HRSD will continue to perform prompt repairs of observed defects (4.6.1 in State Order by Consent) as they are discovered. If a significant number of repairs build up into a backlog, HRSD will prioritize them based on severity of the defects.
- HRSD will implement a Replacement Planning Model (RPM) to develop useful life estimate, cost estimates, and replacement and refurbishment requirements for pump stations, force mains, gravity mains, manholes and other appurtenances for a 20-year planning period.

2.5.8 Implementation Plan

Program Milestone	Description	Time Frame
Failure Investigation Program	Each time an interceptor failure occurs an investigation will be conducted to review the conditions that led to the failure	Per event starting July, 2010
Annual Review of Failures	Review failures to identify possible patterns of failure	Annually starting July 1, 2010
Develop IFM Condition Database	Develop and maintain a database to collect IFM condition information	To be determined
Completely Inspect Gravity System under the SOC and Consent Decree	CCTV contractor to be utilized to inspect entire gravity system	November 2011
Ongoing Gravity System Inspection	CCTV inspection of gravity pipes and manholes	Annually after November 2011
Information Management	Utilize the CMMS to store appropriate condition information	To be determined
IS Preventive Maintenance Manual	The PM Manual will be updated based on new equipment and experience	Every 3 years
Replacement Planning Model	Model to develop cost and useful life estimates for sewer system and appurtenances.	To be determined with next CIP cycle
Hydrogen Sulfide Monitoring Program	Establish baseline survey of hydrogen sulfide levels throughout system.	November 2013
Hydrogen Sulfide Monitoring Program	Operational hydrogen sulfide monitoring program based on results of the initial survey.	November 2015

2.6 Contingency Planning

2.6.1 Program Definition and Purpose

HRSD has prepared contingency plans to implement emergency response procedures to certain situations when it is known there is a potential impending problem in the system or a severe weather event is forecast. When appropriate, these plans are coordinated with the Localities tributary to HRSD and assistance is provided to the Localities in the development of their contingency plans. Trained crews are available 24 hours a day, seven days a week to respond if needed. Equipment such as emergency generators and backup pumps are available in the event of an emergency.

2.6.2 Goals and Performance Measures

The goal of contingency planning is to ensure rapid and consistent response and emergency operations in the event of abnormal conditions.

Due to the varying circumstances encountered during emergency situations, performance measures are not appropriate for contingency response activities. However, HRSD performs a review of each event to account for unforeseen circumstance and to ensure continuous improvement.

2.6.3 Program Description/Components

HRSD maintains a large inventory of pumps in various sizes, as well as pipe fittings to repair leaks or breaks. Due to the unique nature of each pump station, contingency plans may be different for each location. Each pump station may have the following features for operation during emergencies:

- Dual Power Feeds;
- Emergency Generator;
- Emergency Bypass Pumping Operation;
- Emergency Portable Generators; and
- Emergency Portable Pumps

The CSR Response Plan defines procedures that are conducted in the event of a release from the system. Additionally, the plan outlines the regulatory and other communication procedures which are performed in the event of an emergency. In addition to the CSR Response Plan, the Contingency Planning Program includes the following:

- Hurricane Plan;
- Security Task Force;
- Public Notification Plan;
- Agency Notification Plan; and
- Scheduled Flow Control Plan.

2.6.3.1 Hurricane Plan

HRSD is in a hurricane-prone area; therefore a Hurricane Readiness and Recovery Plan are kept up to date and ready to implement. The plan provides for responses to different levels of hurricane warnings, and the Interceptor Division prepares the pump stations and other facilities as appropriate to be able to withstand high winds and possible flooding. Each pump station is equipped with an emergency power source or connection for a portable generator so HRSD can attach portable generators. Some are equipped with dual power feeds. Portable pumps and emergency connections are also available and utilized when needed. During Hurricane Isabel in 2003, HRSD was able to maintain operation in the entire system despite heavy destruction and long-term power outages in the area. Each work center has a plan specific to the facility for operation in the event of a hurricane or a high water event as a result of storm surge or area-wide flooding.

The Hurricane Readiness and Recovery Plan is maintained on HRSD's Sharepoint site and updated as necessary. A hard copy is normally printed for the primary person in charge of each work center at the start of each hurricane season.

2.6.3.2 Security Task Force

Below is a summary of the security features implemented or enhanced since September 2001. Security is a continuous process with further enhancements and/or procedures to be implemented as facilities, employees and technologies change.

2.6.3.2.1 General

1. The Security Task Force was formed in October 2001 to examine vulnerabilities within HRSD facilities and infrastructure to determine what steps to take to minimize and contain threats against HRSD. This group meets periodically to review incidents, recommend improvements and develop security-related procedures for approval by the QST and/or General Manager.
2. Release of information concerning infrastructure is limited to engineering firms and other entities requiring legitimate access to plans and other related documents.
3. Release of information regarding security procedures is authorized only through the General Manager.

2.6.3.2.2 Treatment Plants

1. Fencing surrounds HRSD's treatment plants. Perimeter fencing is inspected on a regular basis to maintain integrity.
2. Mechanical gates are used for access to the plants. Entry requires an authorized access badge. Contractors and visitors are permitted to enter upon verification of their intended purpose.
3. Gate areas are equipped with cameras. Real-time images are transmitted to monitors at various locations within the plant. The images are recorded and are available for review by the Safety Manager.
4. Lighting is assessed periodically to ensure adequate visibility for employees working during night shift.
5. Plants that are adjacent to or located on other property have specific procedures and contact information for the appropriate property owners which includes the US Navy and the Virginia Port Authority. Outside security services are also employed during heavy construction at these facilities.
6. Emergency Response Procedures have been written detailing chemical release response, notification procedures and evacuation procedures. All employees at the plants are trained on these procedures.

2.6.3.2.3 Pump Stations

1. Pump stations and pressure reducing stations (PRS) have a SCADA system, which allows remote warning of system malfunctions and unauthorized access at the facility.
2. Several of the pump stations and PRSs are fully fenced to limit access. Access to wet wells and other vital points of entry at the stations is controlled by locks.
3. Emergency Response Plans (ERPs) have been written with procedures detailing chemical release response, notification, and evacuation. Appropriate employees of the Interceptor Systems Division receive annual training on ERPs.

2.6.3.2.4 HRSD Air Rail Avenue Complex

1. Entry into buildings and gated areas is controlled by an electronic badge system.
2. Authorized contractors are issued a day badge allowing them access to select areas during the time they are providing services.
3. Visitors are required to check in and are normally accompanied by an escort while entering the HRSD buildings.
4. A video surveillance system has been installed to monitor areas including doors, cashiers, parking lots and gates. This system allows real-time viewing from select monitors and features the capability of recording the images.
5. Mail-handling and emergency response procedures are provided to the employees. All Customer Information Services Division employees were trained on these procedures.

2.6.3.2.5 Information Technology

1. The Wide Area Network (WAN) is protected by hardware, software and conventional security measures to maintain its operational integrity. These include firewalls, spam and virus filtering, patches and updates.
2. Detailed guidelines, policy and procedures for computer, Internet and email usage are provided to all employees.

2.6.3.2.6 Personnel

1. All new employees are required to undergo a background investigation.
2. Commercial Driver License (CDL) Drivers transporting hazardous materials are required to undergo a background investigation.
3. All employees are issued an HRSD identification badge by Human Resources. The badge serves as photo identification and as a means to gain access to appropriate facilities and buildings.

2.6.3.3 Public Notification Plan

HRSD uses a variety of outreach strategies to ensure the public is properly informed of major construction projects, emergency repairs and planned maintenance activities. The Chief of Communications issues news releases and coordinates responses to media inquiries on routine and emergency matters. HRSD's Communications and Public Response Plan posted on the HRSD Sharepoint site provides guidance for public communications during emergencies.

2.6.3.4 Agency Notification Plan

When there is an emergency, HRSD notifies DEQ when the result of the emergency has the potential to impact waters of the State. The notification procedures are outlined in Collection System Release Response Plan. DEQ is responsible to notify other parties that may be affected by the problem HRSD is experiencing.

2.6.3.5 Scheduled Flow Control Plan

Whenever HRSD has a pending construction project that has the potential to trigger an overflow or potential problem, a contingency flow control plan may be developed. In the event flow needs to be diverted, a flow diversion plan is developed and the appropriate Localities and plant(s) are notified of the temporary changes in the system. Whenever a contractor is performing work on the system, contingency plans are developed to outline emergency procedures if warranted.

2.6.3.6 Virginia Water/Wastewater Agency Response Network

HRSD has recently become a member of the Virginia Water/Wastewater Agency Response Network (VA WARN). The purpose of VA WARN is to provide a method whereby water and wastewater utilities that have sustained damages from natural or manmade events could obtain emergency assistance in the form of personnel, equipment, materials and other associated services as necessary from other water and wastewater utilities before a local, state or federal emergency declaration is issued. The objective is to provide rapid, short-term deployment of emergency services to restore the critical operations of the impacted utility as soon as possible. Utility performance is increased by being able to tap into resources that would not otherwise be available without the WARN network. Being a member of WARN enhances management performance by being proactive and planning for either manmade or natural emergencies.

2.6.4 Training

HRSD trains interceptor operations personnel on emergency repair procedures and equipment, use of portable equipment, trenching and shoring technology and confined space entry procedures. Technicians complete a 4-year apprentice program, which includes education on various types of preparedness applications.

2.6.5 Information Management

HRSD maintains the latest versions of emergency preparedness documentation on the internal Sharepoint site for company-wide viewing.

2.6.6 Resource Management

The overall lead for the Contingency Planning Program is the Director of Operations. However, all HRSD staff members may be available for response to emergency situations based on their unique responsibilities.

HRSD assigns and communicates to the staff members who are keepers of the various contingency plans and those assignments are adjusted depending on workloads of the staff.

Depending on the situation, emergency bypass pumping may be conducted by HRSD staff or by an outside contractor who specializes in this service. HRSD has a wide variety of pump types and sizes available to set up a bypass pumping operation. For more information see Portable Pump Deployment in Appendix C-1 for North Shore and C-2 for South Shore.

2.6.7 Process for Continuous Improvement

After each emergency event, HRSD evaluates the response and the results of the crew's activities to adjust the contingency plans to continuously improve the procedures.

2.6.8 Implementation Plan

None identified.

2.7 Pump Stations

2.7.1 Program Definition and Purpose

The Interceptor Systems Division – North Shore and South Shore – are responsible for operating and maintaining approximately 500 miles of pipelines and 81 pump stations that convey wastewater from the locality-operated collection systems to HRSD treatment plants. The Divisions provide day-to-day monitoring and response to problems to minimize or prevent leaks and overflows. The Divisions also provide preventive maintenance (PM), interceptor inspections, replacements, and renovations. This program element focuses on operations and maintenance of pump stations including the pressure reducing stations.

2.7.2 Goals and Performance Measures

The goals of the Pump Station Maintenance Program are:

- Provide reliable continuous service and maintain compliance with federal and state regulations;
- Maintain pump stations to minimize operational problems and maximize the useful life of the pumps; and
- Inspect, maintain and lubricate pumps and other equipment according to sound maintenance principles.

Goals		Performance Measures	Target Value
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
Pump Station Annual PMs	Maintain the pump station electrical equipment to protect 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 Preventative Maintenance Manual.	81 pump stations inspected per year
Annual PM for Backup Generators	Preventive maintenance is performed on the emergency generators to protect the safety of the public, the environment is protected and SSOs reduced when electrical power to the pump motors from the public utility has been disrupted.	Each backup generator is to receive an annual preventive maintenance.	55 generators to receive PM per year
Pump Station Inspections	Maintain the pump stations to ensure the public safety, to protect the environment, and to achieve the maximum service life from the pump stations	All pump stations are to be visited and inspected monthly using the checklist in the Pump Station Monthly Report in the Interceptor Systems Preventive Maintenance Manual. These inspections are to occur on a nominal 1 time per month basis and will also include wet well cleaning (No. of Monthly inspections performed per month / No. of pump stations) x 100%	98%

Goals		Performance Measures	Target Value
Pump Station Safety Inspections	Ensure proper condition and safety of equipment within pump stations to prevent injury to personnel.	Safety Inspections of each pump station are to be performed semi-annually in conjunction with Safety Department following the procedures in the Safety SOP and ISPMM. (No. of pump station safety inspections performed / No. of pump stations x 2) x 100%	100%
Pump Stations - Infrared Scan	Infrared scan of electrical components is performed once every two years to locate any loose electrical connections or other incipient electrical failures that produce a heat signature.	Perform Infrared Scan every 2 years. (No. of Pump Station Scanned in past 2 years / No. of Pump Stations) x 100%	100%

2.7.3 Program Description/Components

HRSD operates 66 wet well-type pump stations and 15 pressure reducing stations. Maintenance for each pump station is performed by technicians under the supervision of Pump Station Supervisors. Operation logs are maintained at all pump stations that list the activities of both routine and problem response of the crews. Preventative maintenance is being scheduled and documented through ongoing implementation of a Computerized Maintenance Management System (CMMS).

Pump stations are equipped with SCADA systems and alarms to alert operators to problems so they can take appropriate action.

Back-up power is provided at approximately 65 percent of pump stations via stationary emergency generators with automatic transfer switches. Five portable generators are stored at the South Shore Maintenance Shop located at 1436 Air Rail Avenue, Virginia Beach, VA 23455, and two portable generators are stored at the North Shore Maintenance Shop located at 2301 G Avenue, Newport News, VA 23602. The remaining stations have provisions for dual power feeds or the connection of portable generators and/or portable pumps. HRSD maintains nine stations with dual feed power and evaluates the adequacy regularly through preventative maintenance. In the past 10 years, the recorded dual feed power failures have been minimal, only occurring due to extraordinary circumstances. Record of dual feed power failures can be seen in Table 2-2:

Table 2-1. Dual Feed Power Failure Record since 2000

Station	Date	Cause
Arctic Ave	9/19/2003	Hurricane Isabel
Bloxoms Corner	9/18/2003	Hurricane Isabel
Norchester	8/5/2009	Lightning Strike
Washington Street	11/12/2009	November nor'easter

If high flows occur, HRSD can run standby pumps to help Localities avoid overflows. If conditions warrant, Localities are alerted of high peak flows when they occur. GIS maps may be provided to the Localities as visual representation of problems areas.

Many pump stations are run with variable speed controllers to maintain relatively constant liquid levels in the pump station wet wells. The liquid level is maintained at an elevation that minimizes the free fall distance of the wastewater as it enters the wet well. The shorter free fall distance helps to reduce air entrainment in the wastewater and to reduce splashing and turbulence in the wet well, thereby reducing the release of hydrogen sulfide. The reduction in air entrainment also reduces the amount of air and hydrogen sulfide released in the force main. The reduction of air and hydrogen sulfide release helps to maintain system capacity, slow down the corrosion process and helps to reduce odor problems at pump stations and downstream facilities.

2.7.3.1 Preventative Maintenance

The following pump station checklists and inspection schedules are excerpts of the December 2010 version of the *Interceptor Systems Preventive Maintenance Manual (ISPMM)* that is kept internally on HRSD's Sharepoint site. The ISPMM has been updated to include current checklists and inspection frequencies. Procedures will continue to be reviewed and changed based on operational experience or process changes. Due to operational differences, the North Shore and South Shore inspection checklists differ but examples of all forms are included.

HRSD pump station crews have a goal to check some of the pump stations daily but all at a minimum, three days a week with the exception of holiday weeks. A checklist is followed to examine the condition and operations of the pump station to make sure it is working properly. Fuel tanks are inspected to confirm they are in adequate condition. Crews test batteries, alarms, run emergency generators, and perform checks on the supervisory system to confirm they are in adequate condition. Records of pump curves and alarms are maintained at Pump Station Supervisor's office.

Wet wells are inspected and washed, if necessary, as part of the weekly inspections and pumped down and cleaned, at a minimum, as part of the monthly preventive maintenance.

Crews also check pressures within pipes, monitor SCADA information (which includes pressure settings from pump stations), and monitor flow meters. Whenever roadwork is underway, crews confirm there is no interference with the HRSD system and make adjustments to valve boxes as necessary.

Emergency generators are at stations that do not include duel feed power as a backup power source. A list of Emergency generators is included as Figure 2-14. Preventive maintenance on the emergency generators is performed by the Interceptor personnel. North Shore Interceptors uses a separate inspection form for generators listed as Figure 2-15 and South Shore Interceptors performs generator inspections as part of the monthly pump station inspection shown in Figure 2-8. Automotive Shop personnel also perform an inspection using Figure 2-16. The emergency generators are test run on a monthly basis. The schedule of these services is listed in Figure 2-17.

HAMPTON END DAILY PUMP STATION REPORT

STATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Bridge Street IN OUT								N/A		N/A				
Washington Street IN OUT														
Hampton University IN OUT													N/A	
Willard Avenue IN OUT														
Bayshore IN OUT														
Bloxoms Corner IN OUT													N/A	
Woodland Road IN OUT														
Langley Circle IN OUT													N/A	
Big Bethel IN OUT								N/A		N/A				
Patrick Henry IN OUT										N/A				

1. Wet Well Fan (5.4)
2. Panel Lights (5.2e)
3. Purge System (5.2g)
4. Air Compressor (5.2)
5. Wet well / Bar screens (5.10/5.10c)
6. Pumps - Proper Care (5.6)
7. Bleed Line (5.6g)
8. Shafting (5.6f)
9. Bearing Noise (5.6f)
10. Packing Glands (5.6c)
11. Sump Pump (5.7)
12. Clock Readings (5.1)
13. Generator (2.0)
14. Housekeeping (5.11)

Remarks:

Figure 2-1. Typical North Shore Daily Pump Station Report

WEEKLY REPORT – HAMPTON END

DATE: ____________________

STATION	1	2	3	4	5	6	7	8	9	10
BRIDGE STREET							N/A			N/A
WASHINGTON ST.			N/A				N/A			N/A
HAMPTON UNIV.			N/A				N/A		N/A	N/A
WILLARD AVE.			N/A				N/A			N/A
BAYSHORE			N/A				N/A			N/A
BLOXOMS CORNER			N/A				N/A		N/A	N/A
WOODLAND ROAD			N/A				N/A			N/A
LANGLEY CIRCLE			N/A				N/A		N/A	N/A
PINE CHAPEL			N/A				N/A			N/A
BIG BETHEL	N/A		N/A				N/A	N/A		
PATRICK HENRY			N/A				N/A			N/A

1. Wet well (5.10a)
2. Check Light Fixtures (5.1)
3. Check Tide Gate (4.3c)
4. Inactive Pumps (5.1) Exercise
5. Cut Grass (12n)
6. Pipes & Eqpt. (5.1)
7. Air Dry (5.2h)
8. Air Comp - Bleed (5.2)
9. Generator (2.0) Cooling System
10. Pressure Sensor (5.1) Transducer

Remarks:

Figure 2-2. Typical North Shore Weekly Pump Station Report

HAMPTON END – MONTHLY REPORT

STATION	1	2	3	4	5	6	7	8	9
BRIDGE STREET									
WASHINGTON ST.									
HAMPTON UNIV.					N/A				
WILLARD AVENUE									
BAYSHORE									
BLOXOMS CORNER					N/A				
WOODLAND ROAD					N/A				
LANGLEY CIRCLE									
PINE CHAPEL									
BIG BETHEL									
PATRICK HENRY									

1. Sump Pump Insp. (5.7)
2. Autocon Insp. (5.3b)
3. Alarm Test (6.2)
4. Check Valves (5.8a)
5. Paint-Touch Up (5.6)
6. VFD Range Test (5.6k)
7. Backflow Prevent. (5.5)
8. Gen. Load Test - Tanks/Fuel (2.1)
9. Sluice Gate Operation (5.10b)

Remarks:

Figure 2-3. Typical North Shore Monthly Pump Station Report

STATION	UNIT #	SUCTION DATE	DISCHARGE DATE	SLUICE GATE DATE	SEAL OIL CHANGE
BRIDGE STREET	1				
	2				
	3				
WASHINGTON ST.	1				N/A
	2				N/A
HAMPTON U.	1				N/A
	2				N/A
WILLARD AVENUE	1				N/A
	2				N/A
	3				N/A
BAYSHORE	1				N/A
	2				N/A
	3				N/A
BLOXOMS CORNER	1				N/A
	2				N/A
WOODLAND ROAD	1				N/A
	2				N/A
	3				N/A
LANGLEY CIRCLE	1				N/A
	2				N/A
	3				N/A
BIG BETHEL	1			N/A	N/A
	2			N/A	N/A
	3			N/A	N/A
	4			N/A	N/A
PATRICK HENRY	1			N/A	
	2			N/A	
REMARKS:					

Figure 2-4. Typical North Shore Pump Station Valve Report

PUMP STATION
STRUCTURAL INSPECTION REPORT

System:		Inspector:	
Date:		Time:	
Station Name:		Station Number:	
Pre-Cleaned:		Date:	
Date Constructed:		Odor Control:	
Sand in Well:		Surface pH and Location:	
Depth:			

Surface # 1		Surface # 2	
Wall Slab Other		Wall Slab Other	
Location: North South East West		Location: North South East West	
Concrete Condition:		Concrete Condition:	
Depth of Corrosion:		Depth of Corrosion:	
Visible Steel:		Visible Steel:	
Visible Aggregate:		Visible Aggregate:	
Visible Cracks:		Visible Cracks:	
Original thickness:		Original thickness:	

Surface # 3		Surface # 4	
Wall Slab Other		Wall Slab Other	
Location: North South East West		Location: North South East West	
Concrete Condition:		Concrete Condition:	
Depth of Corrosion:		Depth of Corrosion:	
Visible Steel:		Visible Steel:	
Visible Aggregate:		Visible Aggregate:	
Visible Cracks:		Visible Cracks:	
Original thickness:		Original thickness:	

Notes:

Figure 2-5. North Shore Wet Well Inspection Report

INTERCEPTOR SYSTEMS
ANNUAL PUMP INSPECTION REPORT

LOCATION: ______________________________ **PUMP NUMBER:** ___________

DATE: ______________________________ **CLOCK READING:** ___________

Indicate the condition of the items listed below as either GOOD, FAIR, or NEEDS REPAIR (NR)

1 PUMP FRAME		2 CHECK VALVE		3 SUCTION VALVE	
CONDITION:	___________	CONDITION:	___________	CONDITION:	___________
4 DISCHARGE VALVE		**5 TOP BEARING**		**6 BOTTOM BEARING**	
CONDITION:	___________	CONDITION:	___________	CONDITION:	___________
7 IMPELLOR		**8 VOLUTE**		**9 CLEARANCE**	
LENGTH:	___________	DEPTH:	___________	METAL TO METAL:	___________
CONDITION:	___________	CONDITION:	___________	GASKET:	___________
DIAMETER:	___________	DEVCON:	___________	SHIM THICKNESS:	___________
10 NOSE RING		**11 BASE RING**		**12 STUFFING BOX**	
CONDITION:	___________	CONDITION:	___________	PACKING GLAND:	___________
OD:	___________	OD:	___________	SLEEVE:	___________
ID:	___________	ID:	___________	PACKING NEED:	___________
THICKNESS:	___________	THICKNESS:	___________	YELLOW:	___________
				BLACK:	___________

REMARKS:

INT/NS-REV: NOV 2006 **Signature:** ______________________________

Figure 2-6. North Shore Pump Inspection Report

Pump Station Technician Daily/Weekly Report - Chesapeake Route - Zone /B

General Maintenance: Daily / Weekly Items

1. Wet Well Fan
2. Wet Well (See Manual)
3. Panel Lights
4. Purge System
5. Air Compressor
6. Bar Screen
7. Pumps- Proper Operation
8. Bleed Lines
9. Shafting
10. Bearing Noise
11. Packing Gland
12. Sump Pump
13. Clock Readings
14. Generator Clock
15. Housekeeping
16. Inactive Pumps (Exercise)
17.Pipe / Equipment
18. Air Compressor (Bleed)
19. Generator / Cooling System
20. Transfer Leads(Where Applies)
21. Tide Gate (See Manual)
22.Pressue Sensors/Transducer Units

Station Monthlys:

1. Sump Pump-Inspect
2. Alarm Test
3. Autocon-Inspect
4. Generator Load Test/Fuel Inventory
5. Wet Well Fan
6. Wet Well Inspection
7. Operate Sluice Gate
8. Variable Speed Unit Range Test
9. Check Valve
10. First Aid Kit
11. Fire Extinguishers
12. Eyewash Stations
13.Backflow Preventers Visual Inspection
14. Ladders
15. Signs
16. MSDS Books
17. Emergency / Lighting
18. Staircases
19. Paint-Touch up
20. Chains
21. Hatches
22. Guards Over Rotating Devices
23. Shaft Guards
24. Hoists
25. Grating
26. Guard Rails

Name(s): ______________________ **Date:** __________

Pump Station	**Arrival**	**Depart**	**Remarks**	Mthly Ins	Gen Maint	Landscap	Bypass	De-rag	Other
State Street									
Bainbridge Blvd.									
Quail Avenue									
Quail PRS									
Park Avenue									
Ferebee Avenue									
Washington									
Dozier's Corner									

Name(s): __________________ **Date:** ______

Figure 2-7. Typical South Shore Daily/Weekly Pump Station Report

HRSD Preventive Maintenance

Pump Station Monthly Report

Zone Sect

Date : _____________ **Name : _____________________**

Signature : _____________________

Pump Station	Remarks

1. Sump Pump-Inspect
2. Alarm Test
3. Autocon- Inspect
4. Generator Load Test / Fuel Inventory
5. Wet Well Fan
6. Wet Well Inspection
7. Operate Sluice Gate
8. Variable Speed Unit Range Test
9. Check Valve
10. First Aid Kit
11. Fire Extinguishers
12. Eyewash Stations
13. Backflow Preventers Vis Inspection
14. Ladders
15. Signs
16. MSDS Books
17. Emergency / Lighting
18. Staircases
19. Paint- Touch Up
20. Chains
21. Hatches
22. Guards Over Rotating Devices
23. Shaft Guards
24. Hoists
25. Grating
26. Guard Rails

Figure 2-8. Typical South Shore Monthly Pump Station Report

Hampton Roads Sanitation District
Wet Well Inspection Report
South Shore Maintenance Operations

STATION NAME: **STATION NUMBER:**

DATE BUILT: **DATE INSPECTED:** **TIME:**

INSPECTORS NAME: **WAS WET WELL PRE-CLEANED:**

pH TAKEN: **BEFORE CLEANING:** **AFTER:**

LOCATION OF TESTING:

ODOR CONTROL INSTALLED: **TYPE OF SYSTEM:**

WALL COATINGS APPLIED? **TYPE OF COATING?**

OVERALL COATING CONDITION:

CONDITION OF WET WELL WALLS

	NORTH	SOUTH	EAST	WEST	CEILING
Concrete Condition?					
Original Thickness?					
Visible Aggregate?					
Visible Steel?					
Visible Cracks?					
Depth of Corrosion?					
Influent Channel?					
Intermediate Deck?					

Condition of Stairs or Ladder?

<u>Comments:</u>

Indicate conditions of inspection items as **GOOD, FAIR, POOR, or NEEDS REPAIR (N/R).** Directional indications are to be determined by valve guide for pump station geographical positioning. (North, South etc.) Type of coatings to include: **T-Loc, Grout, None** etc. Type of Odor Control Systems to include: **Scrubber, Liqui-Fog, Ozone, None** etc. Photos will include location and title as a heading. Highlights for each photo are indicated below the pictures.

Figure 2-9. South Shore Wet Well Inspection Report

Interceptor Systems Annual Pump Inspections Report

Location: _______ Pump #: __________________

Date: _______ Clock Reading: __________________

Indicate condition of items listed below as either Good, Fair or Needs Repair (NR). Record measurements before and after repairs; record any problems and/or corrective action taken on reverse side

Pump Frame ___________ Check Valve __________ Packing Gland _________

Top Bearing __________ Suction Valve _________ Sleeve __________

Bottom Bearing _________ Discharge Valve _________ Packing Installed _________

# of Rings __________

Impeller **Nose Ring (Before)** **Nose Ring (After)**

Condition __________ Condition __________ Condition __________

Length Before _________ OD __________ OD __________

Length After __________ ID __________ ID __________

Diameter __________ Thickness __________ Thickness __________

Volute **Base Ring (Before)** **Base Ring (After)**

Condition __________ Condition __________ Condition __________

Depth __________ OD __________ OD __________

Throat __________ ID __________ ID __________

Devcon __________ Thickness __________ Thickness __________

Clearance **Packing Needed:** Yes No

Before **Remarks:** ________________________________

After

Shims

rev 5/09 cmp **Signature:** ________________________________

Figure 2-10. South Shore Pump Inspection Report

Interceptor Systems Annual Pump Inspections Report (PRS)		
Location:		Pump #:
Date:		Clock Reading:
Indicate condition of items listed below as either Good, Fair or Needs Repair (NR). Record measurements before and after repairs; record any problems and/or corrective action taken on reverse side		
Pump Frame ___________	Check Valve __________	Packing Gland _________
Top Bearing __________	Suction Valve _________	Sleeve __________
Bottom Bearing _________	Discharge Valve _________	Packing Installed _________
# of Rings __________		
Impeller	**Nose Ring (Before)**	**Nose Ring (After)**
Condition __________	Condition __________	Condition __________
Length Before _________	OD __________	OD __________
Length After __________	ID __________	ID __________
Diameter __________	Thickness __________	Thickness __________
Volute	**Base Ring (Before)**	**Base Ring (After)**
Condition __________	Condition __________	Condition __________
Depth __________	OD __________	OD __________
Throat __________	ID __________	ID __________
Devcon __________	Thickness __________	Thickness __________
Clearance	**Motor RPMS Checked:** Yes	No
Before	**Remarks:**	
After		
Shims		
rev 5/09 cmp	**Signature:**	

Figure 2-11. South Shore Pump Inspection Report (PRS)

Interceptor Systems Preventive Maintenance

Inspection Schedule

Item	Daily	Weekly	Monthly	Quarterly	Semi-annually	Annually	Other
Air Compressor							
Air Filters – check		X					
Bubbleline - check	X						
Clean Unit			X				
Change Leads		X					
Condensate - drain		X					
Oper. Controls – check	X						
Pet Cocks - check	X						
Purge – manual	X						
Safety Valve - test			X				
Settings – test			X				
Autocon – check			X				
Dehumidifier – check		X					
BackFlow Preventer							
Visual Inspection	X						
Clean Strainer					X		
Test						X	
Valves							
Bypass Clock - test			X				
Check Valves – inspection	X						
Check Valves Hydraulic Service					X		
Gate Valves - exercise					X		
General							
Cold Weather Prep						X	
Hot Weather Prep						X	
Housekeeping	X						

Figure 2-12. Pump Station Inspection Schedule

Inspection Schedule, continued

Item	Daily	Weekly	Monthly	Quarterly	Semi-annually	Annually	Other
Pumps							
Alternate Leads		X*					
Annual Pump Inspection (see form)						X	
Lubrication				X			
Packing Glands – check	X						
Portable Electric	X						
Shafting – check	X						
Variable Speed Units - exercise		X					
Safety Chains/Ropes inspection			X				
Shaft Guards - inspection						X	
Sump Pumps							
Visual Inspection	X						
Test & Service				X			
Wet wells							
Annual Wet Well Inspection (see form)						X	
Bar Screen – clean	X						
Clean Well			X				
Check for Sand			X				
Sluice Gate - exercise			X				

*Note: * Some Exceptions to Alternating Pump Leads on Weekly Basis*

Figure 2-13. Pump Station Inspection Schedule (page 2)

Asset	Position	Description
114265	NS-PS-210-I-0231-01	Ferguson Park - Diesel Engine
114278	NS-PRS-205-I-0231-01	Big Bethel - Diesel Engine
114320	NS-PS-201-I-0231-01	25th Street - Diesel Engine
114339	NS-PS-206-I-0231-01	Bridge St - Diesel Engine
114352	NS-PS-209-I-0231-01	Copeland Park - Diesel Engine
114506	NS-PS-229-I-0231-01	Colonial Williamsburg - Diesel Engine
114556	NS-PS-207-I-0231-01	Center Ave - Diesel Engine
114578	NS-PS-218-I-0231-01	Morrison - Diesel Engine
114626	NS-PS-227-I-0231-01	Fort Eustis - Diesel Engine
114667	NS-PS-203-I-0231-01	Bay Shore - Diesel Engine
114731	NS-PS-231-I-0231-01	Ford's Colony - Diesel Engine
114742	NS-PS-232-I-0231-01	Greensprings - Diesel Engine
114998	NS-PS-216-I-0231-01	Lucas Creek - Diesel Engine
114999	NS-PS-212-I-0231-01	Hilton School - Diesel Engine
115000	NS-PS-230-I-0231-01	Rolling Hills - Diesel Engine
115001	NS-PS-220-I-0231-01	Normandy Lane - Diesel Engine
115002	NS-PS-223-I-0231-01	Washington Street - Diesel Engine
115003	NS-PS-225-I-0231-01	Willard Ave - Diesel Engine
115004	NS-PS-224-I-0231-01	Woodland Road - Diesel Engine
115081	NS-PRS-215-I-0231-01	Lee Hall - Diesel Engine
115082	NS-PS-226-I-0231-01	Williamsburg - Diesel Engine
115094	NS-PS-219-I-0231-01	Newmarket - Diesel Engine
115095	NS-PS-221-I-0231-01	Patrick Henry - Diesel Engine
121251	NS-PS-202-I-0231-01	33rd Street - Diesel Engine
121596	NS-PS-214-I-0231-01	Kingsmill - Diesel Engine
121790	NS-PS-233-I-0231-01	Lodge Road - Diesel Engine
122236	NS-PS-208-I-0231-01	Claremont - Diesel Engine
112844	SS-PRS-151-I-0231-01	Kempsville Road - Diesel Engine
112908	SS-PS-107-I-0231-01	Colley Avenue - Diesel Engine
112970	SS-PS-117-I-0231-01	North Shore Road - Diesel Engine
112980	SS-PRS-139-I-0231-01	Quail Avenue PRS - Diesel Engine
113047	SS-PRS-143-I-0231-01	Shipps Corner - Diesel Engine
113058	SS-PRS-153-I-0231-01	Laskin Road - Diesel Engine
113092	SS-PRS-134-I-0231-01	Pughsville Road - Diesel Engine
113143	SS-PS-135-I-0231-01	Suffolk - Diesel Engine
113155	SS-PS-113-I-0231-01	Luxembourg Avenue - Diesel Engine
113171	SS-PS-110-I-0231-01	Ferebee Avenue - Diesel Engine
113268	SS-PS-103-I-0231-01	Bainbridge Blvd - Diesel Engine
113283	SS-PS-105-I-0231-01	Chesapeake Blvd - Diesel Engine
113311	SS-PRS-112-I-0231-01	Independence Blvd - Diesel Engine
113344	SS-PRS-140-I-0231-01	Atlantic Avenue - Diesel Engine
113512	SS-PS-115-I-0231-01	Newtown Road - Diesel Engine
113537	SS-PRS-133-I-0231-01	Providence Road - Diesel Engine
113686	SS-PRS-120-I-0231-01	Pine Tree - Diesel Engine
113708	SS-PS-128-I-0231-01	Steamboat Creek - Diesel Engine
113753	SS-PS-127-I-0231-01	State Street - Diesel Engine
113824	SS-PS-144-I-0231-01	Elmhurst Lane - Diesel Engine
113833	SS-PRS-138-I-0231-01	Deep Creek - Diesel Engine
113871	SS-PS-124-I-0231-01	Richmond Crescent - Diesel Engine
113873	SS-PS-119-I-0231-01	Park Avenue - Diesel Engine
113917	SS-PRS-137-I-0231-01	Bowers Hill - Diesel Engine
113960	SS-PRS-152-I-0231-01	Terminal Blvd - Diesel Engine
114115	SS-PS-145-I-0231-01	Rodman Avenue - Diesel Engine
114132	SS-PS-146-I-0231-01	Camden Avenue - Diesel Engine
119516	SS-PRS-154-I-0231-01	Rt 337, Gum Rd PRS - Diesel Engine - 01

Figure 2-14. List of Stations with Emergency Generators

NS in position number indicates North Shore and SS indicates South Shore

PREVENTIVE MAINTENANCE CHECK SHEET - EMERGENCY GENERATORS

Technician:	Pump Station:	Date:
Time Started:	Time Shut-Down:	Total Run Time:

ITEM:	Repairs Needed YES	Repairs Needed NO
Crankcase Oil Level		
Oil Leaks		
Coolant Leaks		
Coolant Level		
Condition of Hoses		
Condition of Belts		
Block Heater		
Day Tank Operation		
Fuel Transfer Pump (s)		
Radiator Cleanliness		
Radiator Louvers Operational		
Test Coolant for Proper pH		
Battery Condition		
Battery Charger Condition		
Engine Vibration Isolator Cond.		
Generator Bearing Lubrication		
Generator Inspection		
Air Filter & Induction Sys. Cond.		
Transfer Switch Operation		
Station Alarms Operation		
Gauges Functioning		
Unusual Noises		

NOTE and RECORD:	
Engine Hours - Start	
Engine Hours - Stop	
Engine Oil Pressure	
Coolant Temp.	
RPM	
Frequency	
Voltage Phase 1	
Voltage Phase 2	
Voltage Phase 3	
Exhaust Opacity	
Crank Time to Start	
Battery #1 / Volts	
Battery #1 / CCA	
Battery #2 / Volts	
Battery #2 / CCA	

PARTS USED - DESCRIPTION / PART #

DESCRIBE ALL ACTIONS TAKEN:

Figure 2-15. Automotive Division Inspection for Generators

Form 2-2 Typical North Shore Generator Inspection Report - Monthly Generator Test - Pre-Test / Post Test Inspection

Station	Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Bridge Street																	
Washington St.																	
Hampton Univ.																	
Willard Avenue																	
Bayshore																	
Bloxoms Corner																	
Woodland Road																	
Langley Circle																	
Pine Chapel																	
Big Bethel																	
Patrick Henry																	

Pre-test
1 - Coolant Level
2. Lube Oil Level
3 - Battery Water
4 - Belts
5 - Hoses
6 - Leaks
7 - Fuel On Hand

Testing
8 - Generator On
9 - Generator Off
10 - Generator Run Time
11 - Temperature (Watch after starting)
12 - Oil Pressure (Watch after starting)
13 - Louvers (Operating properly)

Post-test
14 - Lube Oil Level
15 - Fuel On Hand
16 - Leaks

Remarks: ______________________________

Figure 2-16. Typical North Shore Generator Inspection Report

Interceptor Systems Preventive Maintenance

Inspection Schedule

Item	Daily*	Weekly	Monthly	Quarterly	Semi-annually	Annually
Batteries - check water or electrolyte	I				A	
Belts & hoses - inspection	I				A	
Cooling system leaks - check	I				A	
Coolant level - check		I			A	
Clean unit & touch up paint						I
Check day tank & battery charger	I				A	
Check automatic leak detection - underground tanks	I					
Engine lube oil - check	I				A	
Fuel - above ground & belly tanks			I			
Fuel gage - underground tanks					I	
Generator 2-hour test & fuel inventory			I			
Inspect engine preheat indicator	I				A	
Inspect unit for leaks, drips & other defects	I				A	
Test leak detection monitor (button)	I					
Inspect & test leak detection system (sensor) underground tanks				I		
Visual inspection of above ground tanks	I			I		

* *During each station check by Service Technician.*
I=Interceptors
A=Automotive Division

Figure 2-17. Generator Inspection Schedule

2.7.3.2 Electrical

HRSD's North Shore and South Shore Electrical and Instrumentation Shops maintain the electrical and instrumentation equipment at all pump stations. Electrical maintenance procedures are being incorporated into the CMMS program. Infrared scan of electrical components is performed once every two years to locate any loose electrical connections or other incipient electrical failures that produce a heat signature.

2.7.3.3 Mechanical

Interceptor Division pump station crews do most of the mechanical maintenance of pump stations, assisted by the Machine Shops for heavy maintenance and by Automotive Shops for emergency generator maintenance.

2.7.3.4 Structural

Interceptor Division Pump station crews perform only minor structural maintenance. Minor structural and roof work at pump stations is the responsibility of the Facility Support Division. Major structural and rehabilitation, such as wet well rehabilitation that requires contractors, is often incorporated into the CIP.

2.7.3.5 Corrective Maintenance

HRSD pump stations are designed to have the flexibility to operate under different scenarios. HRSD can operate them either automatically or manually if necessary. HRSD has limited capability to redirect the flow in different directions in some locations in the system, utilizing different valving configurations and pump stations. Redirection of flow is done to facilitate maintenance and for emergency purposes. Interceptor supervisors are aware of how the system is valved so they can respond in a timely manner in the event that direction of flows needs to be changed.

When complaints are received or an alarm condition exists in the SCADA system, crews are dispatched to investigate and resolve the problem. HRSD employees are also on call for emergency response outside of normal business hours.

The pump station crews notify Supervisors when corrective maintenance is needed, and the supervisors assign repair crews to perform the corrective work. Minor repairs are performed by pump station crews and more involved corrective maintenance is performed by repair crews.

Emergency power is available at many pump stations. Additionally, HRSD has the ability to hook up portable generators or pumps when necessary. During weather events, operations staff members are in close contact with Localities to maintain communication and collaboration so that HRSD and Locality collection systems are operating in a manner which avoids overflows.

2.7.4 Training

HRSD employees that are responsible for operations and maintenance of pump stations or pressure reducing stations complete HRSD's Apprenticeship Program or equivalent program. The Apprenticeship Program is a combination of on-the-job training and related classroom training. MOM Section 3.2 provides further detail on this program. Vendor and equipment training is provided on an as-needed basis.

2.7.5 Information Management

Operation logs that list the activities of both routine and corrective response of the crews are maintained at all pump stations. Interceptor crew preventative and corrective maintenance are well as work performed by the Facility Support Division (electrical, instrument, carpenter, etc.) are being scheduled and documented in a phased manner through a Computerized Maintenance Management System (CMMS). Pump stations are equipped with SCADA systems and alarms to alert operators to problems so they can take appropriate action.

Records of pump curves and alarms are currently maintained at pump station Supervisors office. Records for preventative maintenance are kept as a record of the activities conducted by the crews.

2.7.6 Resource Management

The pump stations are operated and maintained under the direction of the North and South Shore Interceptor System Chiefs who in turn report to the Director of Operations.

Maintenance for each pump station is performed by Interceptor Division Operators under the supervision of pump station supervisors. The Interceptor Division repair crews perform heavy and intermediate pump station and interceptor maintenance repairs and projects. This group has the heavy equipment and resources to make repairs to the pump stations, force mains and gravity lines. A spare parts inventory is maintained that consists of pipe parts and pump parts necessary to keep the system operating. Emergency contingency plans are in place to react to situations that may arise and crews are available to respond day or night

HRSD's Facility Support Division's North and South Shore Electrical and Instrumentation Shops maintain the electrical and instrumental equipment at all pump stations. The Facility Support Division's Automotive Shop personnel perform preventive maintenance work on the portable emergency generators, and the Machine Shop personnel perform major rebuilds on pumps and miscellaneous equipment.

Interceptor Pump Station Crews perform only minor structural maintenance. Minor structural and roof work at pump stations is the responsibility of the Facilities Support Division. Major structural repairs and rehabilitation, such as wet well rehabilitation that requires contractors, are often incorporated into the CIP.

More comprehensive information concerning the Operations Department can be obtained in the organizational charts in Appendix, pages A-6 through A-20.

Appendix B-1 and B-2 details how North Shore and South Interceptor Divisions assign human and equipment resources to critical MOM components related to pump stations.

2.7.7 Process for Continuous Improvement

HRSD's *Interceptor Systems Preventive Maintenance Manual* was updated in December 2010. This update reflects revised PM checklists, forms, and schedules. Subsequent reviews will reflect additions or deletions of equipment and revised PM procedures. The manual will be reviewed every 3 years to determine if additional revisions are needed. Basic information regarding PM intervals and descriptions from the manual will be gradually incorporated into the CMMS which will allow more efficient work order creation and more timely future revisions.

HRSD is continuing to implement the CMMS to allow more widespread usage. Equipment records will contain design information, maintenance history, current physical condition, criticality, and schedule of inspection and maintenance activities. The reporting information obtained from the CMMS will allow evaluation of the effectiveness individual PM procedures on individual equipment and moreover of the entire MOM Program. HRSD has plans to establish standards to allow the criticality of assets to be determined. The relative criticality of equipment will enhance the decisions made to properly maintain a large system without consuming excessive resources

2.7.8 Implementation Plan

Program Milestone	Description	Time Frame
Issue Updated IS PM Manual	Revise manual to show latest procedures and updated schedules	December 2010
Review and, if necessary, revise PM Manual	The PM Manual should be a living document that reflects changes in equipment and knowledge.	Every 3 Years
Complete CMMS Implementation	Utilize CMMS to contain equipment information, manage PM procedures, and allow reporting.	Summer 2011
Publish standard methods for Asset Criticality	Establish criticality criterion for important equipment categories	To be determined

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2.8 Force Main Maintenance

2.8.1 Program Definition and Purpose

HRSD maintains over 500 miles of pipeline, of which approximately 90 percent is pressurized pipe (force mains). The Interceptors Division – North Shore and the Interceptor Division – South Shore operates and maintains the force main system.

2.8.2 Goals and Performance Measures

The goals of the Force Main Maintenance program are to:

- Provide reliable continuous service and maintain compliance with federal and state regulations;
- Maintain the force main system to minimize failures and impacts to the surrounding communities; and
- Preserve the useful life of the force main system.

Goals		Performance Measures	Target Value
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 inspection of FMs to identify air pockets and leaks. No. of linear feet of FM inspected per year	2,400 linear feet inspected per year
Force Main PM - Air Venting	Force mains must periodically have air and gases vented to prevent loss of efficiency of pump stations and to reduce corrosion of piping due to hydrogen sulfide gas.	Perform air release valve PM, No. of PMs per year	1550 ARVs vented per year
Force Main PM	Force mains must checked periodically for hidden leaks, have air and gases vented, checked for structural damage at exposed pipe crossings, etc to prevent loss of efficiency of pump stations and to reduce corrosion of piping due to hydrogen sulfide gas, etc	Perform Force Main annual PM per Force Main Inspection Procedures in the Interceptor System Preventative Maintenance Manual. [(No. of times Force Main PMs are performed)/(No. of FM annual PMs)] X 100%	100%
FM Pressure Control Valve Inspections	Pressure control valves maintain desired FM pressures upstream of the control valve to allow proper system control, and these devices must be inspected periodically.	FM Pressure control valves are to be inspected annually following the procedures in the Pressure Control Valves section of the Interceptors System Preventive Maintenance Manual. [(No. of pressure control valve vaults inspected per year) / (total No. of pressure control valves)] X 100%	100%
Cathodic Protection	Cathodic Protection Systems reduce the rate of corrosion of the FM piping system by being consumed instead of the pipe material. They must be inspected and replaced as needed.	The Cathodic protection systems in the FM system are to be inspected 1 time per year following the procedures in the Cathodic Protection section of the Interceptor System Preventive Maintenance Manual. [(No. of Cathodic Protections Systems inspected per year / Total No. of Cathodic Protection Systems in the system)] X 100%	100%

2.8.3 Program Description / Components

HRSD's system is primarily comprised of force mains. Flow is collected from Localities, private systems and industries via numerous connection points to HRSD force mains.

2.8.3.1 Preventive Maintenance

Preventive maintenance activities on force mains include monitoring of cathodic protection, venting, ultrasonic testing, and flow monitoring at various locations of HRSD's pressure sewer pipelines. HRSD is developing a hydrogen sulfide monitoring program. Routine venting of gas at established locations is a regular maintenance activity that both improves operations and reduces the potential for buildup of corrosive gases. Venting frequency is based on field conditions and specific experience at that location. The hydrogen sulfide monitoring program will be developed in a phased manner. Initially, a survey of hydrogen sulfide gas concentrations will be conducted to establish a baseline. From this baseline, a routine program of monitoring will be developed and implemented. The force main system will be accessed through existing air vents in order to obtain gas samples for analysis. The frequency and location of sampling will be influenced by pipe material and age and the volume of gas normally vented in that location. The presence of high concentrations of hydrogen sulfide is only an indicator or corrosion potential

The following force main checklists and inspection schedules are excerpts of the December 2010 version of the *Interceptor Systems Preventive Maintenance Manual (ISPMM)* that is kept internally on HRSD's Sharepoint site. Due to operational differences North and South Shore Interceptors use separate forms for force main inspections. Procedures are reviewed and changed based on operational experience or process changes. Interceptor Divisions force main inspection schedule is shown on Figure 2-20.

HRSD PREVENTIVE MAINTENANCE
FORCE MAIN INSPECTION REPORT

LINE NO. &
TITLE ______________________________

Indicate work performed by a check mark and discrepancies by an X or N/A.

Indicate location of all discrepancies by valve guide number and/or item number under REMARKS.

1. AIR VENTS:

Bleed _______

Check rings/Brickwork _______

A.V. Boxes _______

2. VALVES

Valve Boxes _______

Riser Pipes _______

Operator nuts _______

Exercise valves _______

3. ALL BOXES TO GRADE _______

4. MARKERS (STAKES & MARKINGS) _______

5. LEAK DETECTORS _______

6. LEAK CHECK (APPURTENANCES) _______

7. EXPOSED PIPE CROSSINGS _______

8. TOTAL NUMBER OF AIR VENTS _______

9. TOTAL NUMBER OF VENTS VENTED _______

REMARKS: ______________________________

Figure 2-18. North Shore Force Main Inspection Report

HRSD P.M. REPORT LINE

DUE : DESCRIPTION	V.G. NO.	NO.	VALVE POSITION	EXERCISED TURNS	AIR MIN.	AIR SEC.	BEFORE VENTING	AFTER VENTING

Figure 2-19. North Shore Force Main Line Inspection Report

HRSD PREVENTIVE MAINTENANCE

FORCE MAIN INSPECTION REPORT

LINE NO.

Indicate location of all MAJOR discrepancies by valve guide number under REMARKS. Indicate work performed during inspection by item number only.

1. AIR VENTS:	Bleed	
	Brickwork	
	Other	
2. VALVES	Valve Boxes	
	Riser Pipes	
	Operator Nuts	
	Exercise Valves	
	Other	

3. ALL BOXES TO GRADE	
4. MARKERS	
5. LEAK DETECTORS	
6. COLOR CODE FM	
7. LEAK CHECK (walk line)	
8. EXPOSED PIPE CROSSINGS	
9. GPS COMPLETED	
10. TOTAL # AV'S PM'D	

REMARKS:

SIGNATURE:

COMPLETED:

Figure 2-20. South Shore Force Main Inspection Report

HRSD PREVENTIVE MAINTENANCE FORCE MAIN INSPECTION REPORT

LINE: Riser: S=Steel

C=Copper

Date	Description	Valve guide #	Valve #	Valve Total Start PSI	Turns Req'd End PSI	Air Min Sec		Remarks	Riser	GPS

Figure 2-21. South Shore Force Main Line Inspection Report

Interceptor Systems Preventive Maintenance

Inspection Schedule

Item	Daily	Weekly	Monthly	60 Days	Annually	Other
Air Vents					X	
Cathodic Systems					X	Ref. Para. 3.13 of ISPMM
Expansion Couplings					X	
Leak Indicators					X	
Pipe X-ing Supports					X	
Valves – Blow Off					X	
Valves – M.L. and Branch					X	
Valves – Pressure Control (in-service)			X			
Vents - Automatic				X		

Figure 2-22. Interceptor System Force Main Inspection Schedule

In addition, HRSD is investigating technologies, such as acoustic monitoring, intelligent pigging, etc, that may allow for the internal inspection of force mains without taking them out of service. Following the Condition Assessment Program required by the SOC and Consent Decree, HRSD will evaluate the use of various technologies for force main inspection as part of the ongoing MOM Program.

2.8.3.2 Valves

Isolation valves on force mains are exercised periodically with a goal of semi-annual exercise for all critical valves. All valves are exercised as part of the force main annual PM. When exercising the valves, interceptor crews report valves that need to be repaired and schedule those valves for routine or more extensive maintenance as required. The total number of turns it takes to close a valve is recorded so it is certain when a valve is closed.

Air release valves are operated a minimum of every 6 months and more frequently as needed to release air/gases from the force mains. Air release valves that show signs of corrosion are replaced to eliminate the possibility of a failure that could result in a sanitary sewer release.

2.8.3.3 Corrosion Control

Corrosion control includes measures for corrosion prevention and monitoring for the pressure pipe-lines. Control measures for HRSD's force mains consist of cathodic protection, air entrainment considerations, and external ultrasonic wall thickness testing.

2.8.3.4 Cathodic Protection

Cathodic Protection is a technique used to protect metal structures from corrosion and is used to protect buried metallic pipelines susceptible to corrosion in HRSD's system. Sacrificial Anode and Impressed Current are two methods of providing cathodic protection to the pipes. Section V.B.5 of the Standards and Preferences for Engineered Construction Projects requires an evaluation for the need for cathodic protection based on soil conditions and stray currents from other utilities.

2.8.3.4.1 Impressed Current Cathodic Protection

Impressed Current Cathodic Protection system uses anodes connected to a power source. The system provides an electrical path from the anode array to the cathode (pipeline). The anodes corrode, reducing the corrosive reaction in the pipeline. HRSD staff monitors impressed current systems as part of the monthly preventive maintenance inspections. Additional testing is conducted by a National Association of Corrosion Engineers-certified Corrosion Technician annually. Test results are used for analysis and determination of any needed corrective action.

2.8.3.4.2 Sacrificial Anode Systems

The sacrificial anode systems are very similar to the impressed current systems except that sacrificial galvanic anode systems do not use a rectifier to drive the current from the anode to the pipe. The galvanic anode corrodes, consuming the anode material until it must be replaced. The current generated by the dissimilar metals flows from the anode to the cathode (pipeline).

HRSD annually monitors the condition of the sacrificial anodes, analyzes the results and HRSD technicians execute any needed service or replacements. When necessary, additional testing is conducted by a National Association of Corrosion Engineers -certified Corrosion Technician.

2.8.3.5 Air Entrainment Reduction Program

The air entrainment reduction program, which consists of minimizing air entrainment at wet wells, received AMSA's Operations Award in 1994 for developing a training video-tape and brochure on protecting HRSD pipelines from entrained air. The video, "Protecting Our Pipelines – Eliminating Entrained Air," can be accessed via the Internet at http://www.hrsd.com/pipesandpumpstations.htm.

Reduction of air entrainment in interceptor force mains helps to reduce corrosion and failure of force mains due to sulfuric acid attack. Excessive air entrainment in interceptor force mains is the result of flow that cascades into the wet well, as well as vortexing around the pump suction intakes. Air entrainment in interceptor force mains may be reduced by design and/or operation considerations of pump stations and force mains.

Design practices are documented in HRSD's Standards and Preferences for Engineered Construction Projects. Examples of generally accepted Operating practices include:

1. Replace pneumatic ejector pump stations with conventional pumps.
2. Minimize wet well turbulence and splash.
3. Eliminate free discharge or falling jets from incoming sewers and force mains by:
    a. Raising minimum wet well levels to minimize or eliminate drops.
    b. Directing incoming flows below the minimum wet well level using chutes.

   c. Directing incoming flow away from pump suction lines.
   d. Relocating air relief discharges, sump pump discharges, and bubbler control discharges away from pump suction lines.
   e. Eliminate vortex formation at pump suction intakes by raising minimum wet well level to submerge pump suction lines.
4. Operate all installed force main air release valves periodically with a frequency depending upon experience and air accumulation at each air vent.
5. Install and operate additional air release valves where needed and not originally installed.

Raising the wet well levels to reduce or eliminate drops has not compromised system operation which is closely monitored and adjustments are made when necessary.

2.8.3.6 Ultrasonic Testing

Ultrasonic non-destructive testing characterizes material thickness, integrity, or other physical properties by means of high-frequency sound waves. In thickness testing, ultrasonic techniques permit quick and reliable measurement of pipe wall thickness without requiring access to both sides of the pipe. Thickness can be measured of material types such as: metals, plastics, ceramics, composites, epoxies and glass.

HRSD conducts ultrasonic pipeline thickness testing and visual inspection when opportunities present themselves. These opportunities include but are not limited to, when a pipe is taken off-line for maintenance or repair and if a condition problem is suspected at a specific point. Measure of wall thickness can be used to monitor for corrosion. Corrosion coupons are also monitored to gauge corrosion activity in a line.

2.8.3.7 Ongoing Condition Assessment

After the initial round of condition assessment activities described in Section 2.5, HRSD will re-evaluate those force mains previously inspected and not found to be at material risk of failure periodically based on observed conditions, failure histories and other available data. Force mains at potential material risk of failure will be subjected to further inspection. Where there are actual conditions that present a material risk of failure, HRSD will develop specific rehabilitation and/or replacement plans and associated schedules to address these defects. Force mains determined to not be at material risk of failure will be considered for inspection in the future based on the findings of the condition assessment.

HRSD will conduct a periodic review of pipeline assessment technologies suitable for force mains. Where warranted, HRSD may elect to pilot test technologies that demonstrate promise. When these technologies yield useful condition information that supports refurbishment and replacement decision making and the technologies are reliable and cost effective, they will be considered for inclusion in HRSD force main assessment program.

HRSD will assess the condition of the interceptor force main (IFM) system via a multifaceted approach. On an annual basis after the initial round of inspections under the SOC and Consent Decree, HRSD will review all IFM failures that occurred over the past year to identify any patterns to the failures. This review will be led by the Special Assistant for Compliance Assurance using an ad hoc team that has representatives from Interceptor Operations and Engineering. For each failure that occurs, HRSD will review the condition of the pipe in the vicinity of the failure to determine the conditions that led to the failure. For pipes that have conditions that materially increase the risk of failure (e.g., extensive internal corrosion, etc.), HRSD will either perform additional condition assessment to define the magnitude of the problem or schedule the line for rehabilitation or replacement. Additional condition assessments will be based on location, material, and potential risk.

In addition, HRSD will conduct force main condition assessment activities on an opportunistic basis, where practical, in conjunction with force main repairs and connections. Such information may include pipe coupons and wall thickness testing. HRSD will develop and maintain a database that captures IFM pipe condition data collected through various means. This will include opportunistic pipe wall thickness measurements, where appropriate, for pipe that is tapped (e.g., installation of corporation stops for air relief valves, etc.) of otherwise accessed internally. For pipe that is replaced, representative samples will be collected, analyzed and the results entered into the database to characterize pipe conditions. Trends will be monitored for patterns that may indicate certain types of pipes are at increased risk of failure.

As HRSD builds its force main and condition database, more information will be available to analyze trends in the data. If such trends identify pipe types/locations prone to failure at a higher rate, then representative assessment of this pipe group would be warranted. The sample would be composed of the segments with the highest consequence of failure.

2.8.3.8 Corrective Maintenance

When a force main fails, HRSD responds with the appropriate equipment and parts to make the necessary repairs. To minimize the potential of a spill of sewage to the environment, bypass pumping or flow diversion may be needed to isolate the location to be repaired.

If sewage is released, HRSD staff members follow the procedures outlined in the Collection System Release Emergency Response Plan.

2.8.4 Training

HRSD employees that are responsible for operations and maintenance of pump stations or pressure reducing stations complete HRSD's Apprenticeship Program or equivalent program. The Apprenticeship Program is a combination of on-the-job training and related classroom training. MOM Section 3.2 provides further detail on this program. Vendor and equipment training is provided on an as-needed basis.

2.8.5 Information Management

HRSD is implementing a CMMS. This system records and keeps track of maintenance records to assist staff in identifying what actions need to be taken in response to problems, identifying normal maintenance, and scheduling needed maintenance. An inventory capability is part of the system.

GIS is also used to manage information about interceptor force mains. Record drawing information is managed in the Meridian system. Both sources are maintained on HRSD servers.

The North Shore has a corrosion coupon database and an ultrasonic reading database maintained by Engineering Assistants. Additional condition data will be kept in a dedicated database.

2.8.6 Resource Management

The HRSD force main system is operated and maintained under the direction of the Chief of Interceptors – North Shore and the Chief of Interceptors – South Shore. Both of these chiefs report to the Director of Operations.

Appendix B-1 and B-2 detail how each Interceptor Division's human and equipment resources are assigned to critical MOM components related to force mains.

2.8.7 Process for Continuous Improvement

HRSD updated the *Interceptor Systems Preventive Maintenance Manual* in December 2010. This update reflects updates to inspection checklists, forms, and schedules. Ongoing reviews will incorporate additions or deletions of equipment, revised PM procedures, and any revised PM schedules. The manual will be reviewed every 3 years to determine if additional revisions are needed. Information from the manual will be gradually incorporated into the CMMS which will allow more efficient work order creation and more timely future revisions. HRSD is continuing to implement the CMMS to allow more widespread usage. Equipment records will contain design information, maintenance history, current physical condition, criticality, and schedule of inspection and maintenance activities. The updated Preventive Maintenance procedures and schedules from the updated Interceptor Systems Preventive Maintenance Manual will be incorporated into the CMMS. The reporting information obtained from the CMMS will allow evaluation of the effectiveness individual PM procedures on individual equipment and moreover of the entire MOM Program. HRSD has plans to establish standards to allow the criticality of assets to be determined. The relative criticality of equipment will enhance the decisions made to properly maintain a large system without consuming excessive resources.

HRSD is investigating technologies, such as acoustic monitoring, intelligent pigging, etc. that may allow for the internal inspection of force mains without taking them out of service. If these technologies prove to be cost effective and feasible, HRSD will utilize them where appropriate.

2.8.8 Implementation Plan

Program Milestone	Description	Time Frame
Issue updated version of PM Manual	Revise manual to show latest procedures and correct schedules	December 2010
Review and, if necessary revise PM Manual	The PM Manual should be a living document that reflects changes in equipment and knowledge.	Every 3 years
Complete CMMS implementation	Utilize CMMS to contain equipment information, manage PM procedures, and allow comprehensive reporting.	Summer 2011
Review available condition assessment technologies	Evaluate new technologies for possible use	To be determined

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2.9 Gravity System

2.9.1 Program Definition and Purpose

HRSD operates a gravity sewer system, performs routine maintenance and cleaning, assesses the condition of the system, and performs corrective maintenance when required to keep the system running in an effective and safe manner.

2.9.2 Goals and Performance Measures

The goals of the Gravity System Maintenance program are to:

- Provide reliable continuous service and maintain compliance with federal and state regulations;
- Maintain the gravity system to minimize impacts to the surrounding communities; and
- Preserve the useful life of the gravity system.

Goals		Performance Measures	Target Value
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
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
Manholes	The integrity of manhole structures is important to contain sewerage, to allow safe maintenance access, and to avoid obstructions caused by failed manhole materials.	All manholes will be opened and visually inspected within a 5 year time span using the Manhole and Field Inspection Report form in the Interceptor System Preventive Maintenance Manual. [(No. of manholes inspected per year) / (Total number of manholes /)] x 100%	20%/year 272 Manholes/yr
Exposed Pipe Crossings	Exposed sections of gravity main supported by bents, cradles, hangers, etc. are more subject to external pipe damage and must be inspected periodically.	All exposed PM locations are to be inspected annually as described in the Exposed Pipe Crossings section in the Interceptors System Preventive Maintenance Manual. [(No. of exposed locations inspected per year) /(Total No. of exposed locations)] x 100%	100%

Goals		Performance Measures	Target Value
Siphon Chambers	Properly maintained siphon chambers allow siphons to perform properly	The Siphon Chambers are to be visually inspected annually following the procedures in the Siphon Chambers section of the Interceptor System Preventive Maintenance Manual. (No of Siphon Chambers inspected per year / Total number of Siphon Chambers) X 100%	100%

2.9.3 Program Description / Components

HRSD owns approximately 500 miles of pipeline, of which approximately 10 percent are gravity lines. The condition of HRSD's gravity collection system facilities is assessed and upgrades are recommended as necessary. Interceptors Division – North Shore and Interceptors Division – South Shore provide operations and maintenance of the gravity system.

2.9.3.1 Preventive Maintenance

The collection systems and the portion of laterals in the public right of way serving residents and businesses are owned and maintained by the Localities. These local collection lines discharge to HRSD's lines which are larger and generally do not experience the same problems as the smaller residential lines. For instance, Fats, Oils and Grease (FOG) accumulation and root intrusion are more of a problem for the Localities' smaller diameter lines than with HRSD's larger lines.

Preventive Maintenance activities are conducted on the gravity system and appurtenances on a proactive basis to identify and resolve problems before they result in failures that can cause overflows. Preventive maintenance schedules are defined based on past system performance and experience, but are typically scheduled to be cleaned and televised system-wide on a 5-year cycle.

Due to operational differences North Shore and South Shore Interceptor use different inspection forms. North Shore specific forms for exposed pipe crossing inspections and tide gate inspections are shown in Figures 2-23 and 2-24. The Interceptors gravity system inspection schedule is shown in Figure 2-25. This is an excerpt from the December 2010 Interceptor Systems Preventative Maintenance Manual kept internally on HRSD's Sharepoint site. The ISPMM will continue to be updated. Procedures are reviewed and changed based on operational experience or process changes.

NS EXPOSED PIPE

CROSSING INSPECTION

WORK SHEET

ITEMS TO CHECK	CONDITION	REMARKS
ABUTMENTS		
SUPPORTS		
CONCRETE CRADLES		
CONDITIONS OF FAN GUARDS		
JOINT DIAPERS		
PIPE JOINTS		

ITEMS TO CHECK	CONDITION	REMARKS
PIPE LINE FOR CRACKS AND BLEMISHES		
PIPE COATING		
PIPE LINE LABELS & MARKINGS		
BRUSH CLEARING OR TREE REMOVAL		
GROUND SURFACE EROSION		
STRAPS & HANGERS		
EXPANSION JOINTS		

Figure 2-23. North Shore Exposed Crossing Inspection Report

:

NS TIDE GATE INSPECTION

WORK SHEET

BRIDGE STREET

LINE:

ITEMS TO CHECK	CONDITION	REMARKS
EXPOSED STEEL		
EXPOSED AGGREGATE		
LARGE GATE to include frame, shutter, pins, hinges, bolts, nuts		
SMALL GATE to include frame, shutter, pins, hinges, bolts, nuts		
PIPE WORK		

ITEMS TO CHECK	CONDITIONS	REMARKS
GATE COATINGS		
CHAMBER HATCHES & COVERS		
BRUSH CLEARING OR TREE REMOVAL		
GROUND SURFACE		
EROSION		
WATER INFILTRATION		

Figure 2-24. North Shore Tide Gate Inspection Report

Interceptor Systems Preventive Maintenance

Inspection Schedule

Item	Daily	Weekly	Monthly	Quarterly	Semi-annually	Annually	Other
CCTV Inspection							every 1-5 yrs
Manholes							every 1-5 yrs
Pipe Crossings, Exposed						X	
Siphon Chambers						X	
Tide Gates			X		X		

Figure 2-25. Gravity System Inspection Schedule

2.9.3.2 Closed Circuit Television (CCTV) Inspection

As part of enhancing the integrity of HRSD's network of gravity mains, CCTV is used to inspect HRSD gravity pipelines. Operators of the CCTV system are certified in the NASSCO PACP program and use the PACP rating system to identify the severity of the defects found during the inspection process. The PACP defect coding provides a level of consistency in the defect rating; therefore, HRSD and others reviewing the inspection records can understand and use the information accordingly.

CCTV inspection is a non-destructive, proactive approach to evaluate the HRSD pipeline infrastructure and is used when observed data is necessary to assess the condition of the pipeline interior. A CCTV inspection may be utilized to:

1. Inspect pipeline condition and to determine the location of problem areas such as pipe or joint separations, drops, ruptures, obstructions, deterioration, pipe misalignment, and root intrusions.
2. Locate infiltration and inflow sources.
3. Look for damage to sewers caused by excavation and construction.
4. Search for unrecorded connections, such as illegal or unauthorized tap-ins.
5. Evaluate effectiveness of pipeline repairs, replacement, and/or rehabilitation within the sewer system.
6. Assess pipeline condition of new installation before the warranty period ends.

The long term CCTV program has a goal of inspecting gravity pipelines on a five-year cycle. However, this goal is adjusted according to the condition of the pipe. Pipes that have been inspected and found to be in good condition or pipes that have recently been lined do not require re-inspection as frequently. Conversely, pipes that are found to have some defects but do not yet require immediate rehabilitation are inspected more frequently. Moreover, HRSD plans to inspect 39,600 linear feet of pipe per year. CCTV inspection reports and videos are generated after each evaluation. Reports are filed by line number and reference the appropriate DVD or VHS tape. Along with reports and inspection videos, an updated record on the progress of the normal inspection schedule is kept. An up-to-date copy of CCTV inspection status spreadsheet is located on the data server.

The Interceptor Systems Division – North Shore identifies portions of the gravity system that may be more subject to problems such as inverted siphons, known reverse grades, and known conditional issues. These areas are listed for inspection more frequently than once every 5 years.

Although the goal is to assess all gravity segments, some segments may be inaccessible due to steep slopes or other conditions. If HRSD identifies any such segment, the upstream and downstream segment will be assessed and supplemented with pole cameras. Such inaccessible segments will be identified in the record.

2.9.3.3 Routine Cleaning

HRSD owns combination sewer trucks that are used for system cleaning. These trucks are fitted with the combination of high velocity flushing and vacuum equipment. Cleaning is also done by contract.

The gravity system is scheduled to be proactively cleaned on an approximately five year cycle. If recurring problem areas are identified, they are cleaned on a more frequent basis. Pump station wet wells are cleaned on a regular basis to avoid blockages and minimize wear and tear on the equipment. HRSD plans to clean 26,600 linear feet of gravity sewer per year.

2.9.3.3.1 Root Control Program

Due to the relatively large diameter of the HRSD pipes, root intrusion is not typically a major problem. CCTV inspection may be utilized to assess the condition of the pipes and determine the location of any root intrusion. If roots are found in the system and have the potential to cause an obstruction to the flow, specialized equipment or chemical applications are employed, where appropriate.

2.9.3.3.2 Manhole Preventative Maintenance

For the small number of manholes owned and maintained by HRSD, there is a proactive inspection program, with a goal to inspect all of the manholes on a five year cycle.

As structural problems are found or if significant I/I is seen entering through the manholes, rehabilitation is scheduled based on the severity of the defect.

HRSD installs water tight manholes in areas subject to flooding to minimize the amount of I/I entering the manhole through the lid. Level meters and flow meters may be installed in some manholes to determine the amount of flow in the pipe and to monitor surcharge of manholes which may eventually result in overflows.

2.9.3.4 Corrective Maintenance

Corrective Maintenance is needed when an unanticipated problem occurs in the system as a result of blockage, construction activities or an act of vandalism. The same equipment and techniques used in the preventive maintenance activities are employed for corrective maintenance. If the problem results in a release from the collection system, the crews follow the steps outlined in the Collection System Release Response Plan. The locations of overflows are recorded in the GIS system to document cause and pattern of failures that may require additional investigation and preventive maintenance activities.

The Interceptor Divisions submit requests to the HRSD Capital Improvement Program based on known problems, equipment obsolescence, or improvement opportunities. These requests are collected and analyzed by the Engineering Department using an established set of criteria to establish the relative priority of each proposed item.

2.9.3.5 Response to Complaints

Typically, complaints are made to the Operations Coordinator and are forwarded to the appropriate supervisor. These supervisors respond, either during normal work hours or after hours. HRSD maintains a nighttime and weekend answering service that records complaints and forwards them to the supervisor on duty. Complaints are responded to promptly by an on-call staff member. These on-call employees, located on the north and south shores, respond quickly to let the caller know what action is being taken. Standby crews are available 24 hours a day on both shores to respond to any problem requiring additional maintenance action. Other crews can be called in if required or private contractors can be utilized. Activities associated with the response are recorded in the CMMS system.

2.9.4 Training

HRSD employees that are responsible for operations and maintenance complete HRSD's Apprenticeship Program or equivalent program. The Apprenticeship Program is a combination of on-the-job training and related classroom training. MOM Section 3.2 provides further detail on this program. Vendor and equipment training is provided on an as-needed basis. Operators of the CCTV system are certified in the NASSCO PACP program.

2.9.5 Information Management

HRSD is implementing a CMMS. This system records and keeps track of maintenance records to assist staff in identifying what actions were taken in response to problems, identifying normal maintenance, and scheduling needed maintenance. An inventory capability is part of the system.

CCTV inspection reports and videos are generated after each evaluation. Reports are filed by line number and reference the appropriate DVD or VHS tape. Along with reports and inspection videos, an updated record on the progress of the normal inspection schedule is kept.

2.9.6 Resource Management

The gravity system is operated and maintained under the direction of the Chief of Interceptors – North Shore and the Chief of Interceptors – South Shore. Both of these Chiefs report to the Director of Operations.

The Interceptors Systems Division maintenance crews perform the heavy pump station and interceptor maintenance repairs and projects. This group has the heavy equipment and resources to make repairs to the pump stations, force mains and gravity lines. A spare parts inventory is maintained that consists of pipe parts and pump parts necessary to keep the system operating.

Appendix B-1 and B-2 details how each Interceptor Division's human and equipment resources are assigned to critical MOM components related to gravity system.

2.9.7 Process for Continuous Improvement

HRSD's *Interceptor Systems Preventive Maintenance Manual* was updated in December 2010. This update reflects revised PM checklists, forms, and schedules. Subsequent reviews will reflect additions or deletions of equipment and revised PM procedures. The manual will be reviewed every 3 years to determine if additional revisions are needed. Information from the manual will be gradually incorporated into the CMMS which will allow more efficient work order creation and more timely future revisions. HRSD is continuing to implement the CMMS to allow more widespread usage. Equipment records will contain design information, maintenance history, current physical condition, criticality, and schedule of inspection and maintenance activities. The updated Preventive Maintenance procedures and schedules from the updated *Interceptor Systems Preventive Maintenance Manual* will be incorporated into the CMMS. The reporting information obtained from the CMMS will allow evaluation of the effectiveness individual PM procedures on individual equipment and moreover of the entire MOM Program. HRSD has plans to establish standards to allow the criticality of assets to be determined. The relative criticality of equipment will enhance the decisions made to properly maintain a large system without consuming excessive resources

Currently, HRSD is pilot testing a number of technologies for assessing pipelines that include acoustical, ultrasonic, laser and sonar technologies. Depending on the results of this and subsequent testing, HRSD may use those technologies that are cost effective and provide reliable data to inspect gravity sewers.

2.9.8 Implementation Plan

Program Milestone	Description	Time Frame
Issue updated version of PM Manual	Revise manual to show latest procedures and correct schedules	December 2010
Review and, if necessary, revise PM Manual	The PM Manual should be a living document that reflects changes in equipment and knowledge.	Every 3 years
Complete CMMS implementation	Utilize CMMS to contain equipment information, manage PM procedures, and allow comprehensive reporting.	Summer 2011
Complete condition assessment technology review	Evaluate new technologies for possible use	Periodically

2.10 Maintenance of Way

2.10.1 Program Definition and Purpose

Proactive maintenance of right-of-ways (ROW) and easements minimizes delays when operations and maintenance crews need to access sewer system assets for inspection or repair. Maintenance includes mowing grass, clearing brush and preventing structures from being built in the ROW. As part of preventive maintenance, HRSD, using either in-house crews or outside contractors, proactively maintains the ROW, as well as monitoring street paving activities to coordinate repairs and to reduce the number of manholes and valve boxes that are covered over when the street is resurfaced.

2.10.2 Goals and Performance Measures

The goals for the amount of ROW to maintain depend on the mix of off-street and on-street ROW in the system. Some ROW may require more frequent clearing and this is monitored by maintenance crews as they perform routine and corrective maintenance.

Goals		Performance Measures	Target Value
ROW's and easements maintenance	Maintaining access to system infrastructure in Rights of Way provides access for maintenance and repair and improves the visibility of problems.	(No. of linear feet of ROW maintenance performed per year / Goal of 132,000 linear feet/year)	87,000 ft NS 45,000 ft SS

2.10.3 Program Description / Components

2.10.3.1 Maintenance of Rights-of-Way and Easements

Accessible ROW and easements are typically mowed and cleared of brush and trash to allow maintenance access. The crews check valves, air vents, reset any castings, as necessary, and ensure that the line is properly marked to indicate that there is an underground pipeline in the area. In remote areas, such as fields, swamps and in the forest, stanchions or bollards are installed, if possible, near the valves to identify their location.

2.10.3.2 Monitoring of Street Paving

HRSD shares its Capital Improvement Plan information with all the Localities to try to avoid conflicts with repair and replacement activities. Paving schedules are reviewed to ensure work requiring excavation is completed before the streets are paved, if possible. Close coordination is needed to ensure all valve boxes are raised to grade in conjunction with the paving.

2.10.3.3 Monitoring of Street Closures

HRSD Engineering receives planning agendas from all the Localities' planning commission meetings. Often roads are permanently closed or vacated for a variety of reasons that require planning commission approval. HRSD reviews the road closures location closely to ensure pipelines are not located in the right of way being vacated. If HRSD has a pipeline in the right-of-way being proposed for closure, a permanent easement is requested as part of the vacation process.

2.10.4 Training

HRSD staff is provided training on the use of the equipment needed to maintain the ROW, as well as safety awareness training on the equipment. For more detail on the training programs available to HRSD staff, please refer to Section 3.2 of this plan.

2.10.5 Information Management

The locations of rights-of-way that are cleared are recorded in the work management system until such time that the CMMS is fully implemented. Geospatial information on pipeline and associated right of ways are available in GIS.

2.10.6 Resource Management

For maintenance of ROW work, HRSD's Interceptor Divisions rely upon Operations staff to maintain access to system components as a partial duty. The Chief Foreman manages this work and reports to the Chiefs of Interceptor Operations. Crews have access to a wide variety of tools and equipment to maintain the ROW.

South Shore intends to contract out the ROW maintenance duties beginning in 2011.

2.10.7 Process for Continuous Improvement

HRSD will continue to maintain the ROW with the in-house crews and contractors to minimize delays when operations and maintenance crews need to access sewer system assets for inspection or repair.

2.10.8 Implementation Plan

None identified.

2.11 Sewage Treatment Plants (STPs) Operations and Maintenance

2.11.1 Program Definition and Purpose

The Treatment Divisions (North Shore and South Shore) are responsible for operation and maintenance of HRSD's 9 treatment plants (four on North Shore and five on South Shore), discharge permit compliance and solids utilization. The treatment processes used vary somewhat from plant to plant and are highly complex involving physical, biological and chemical processes. Each facility has an Operations and Maintenance (O&M) Manual that is specific to that facility.

2.11.2 Goals and Performance Measures

The goals of HRSD's STP Operations and Maintenance Programs are:

- Provide clear and concise instructions for operators to perform critical job functions in order to maintain permit compliance
- Prevent health and safety related accidents
- Maintain consistent reporting procedures
- Prevent equipment failures by providing proper maintenance
- Provide proper response for all emergencies or disruption of operations
- Provide training to employees on all of the above

2.11.3 Program Description / Components

2.11.3.1 Standard Operating Procedures (SOPs)

HRSD maintains written documents and instructions for steps and activities that operators are required to perform at the STP. These SOPs are used regularly by operators to perform their job functions. These SOPs are updated from time to time to reflect changes in procedures. The SOPs include the following:

- Safety
- Administration
- Regulatory Reporting
- Sampling and Testing
- Data Recording

2.11.3.2 Operations and Maintenance (O&M) Manuals

Operating and maintenance procedures are contained in plant specific O&M manuals. All STP facilities utilize CMMS for work order generation for planned maintenance activities.

2.11.3.3 Virginia Pollutant Discharge Elimination System (VPDES) Permit

Section 402 of the Clean Water Act established the National Pollutant Discharge Elimination System to limit pollutant discharges into streams, rivers, and bays. In the Commonwealth of Virginia, DEQ administers the program as the Virginia Pollutant Discharge Elimination System (VPDES). HRSD has an excellent compliance record with the VPDES permit and has won numerous plant performance awards. Material storage and handling is carefully monitored at each plant site to prevent discharges to the storm drain. HRSD is also subjected to unannounced inspections by the Virginia Department of Environmental Quality. Procedures for handling spills at wastewater treatment are documented in HRSD's STP Response Plans.

2.11.4 Training

All HRSD staff involved in O&M functions at STPs are properly trained on appropriate portions of the SOPs and O&M Manuals. The requirements for storm water pollution prevention through the VPDES permit process is communicated to employees through the STP response plans. Spill response training is provided at each STP.

2.11.5 Information Management

HRSD's SOPs and O&M Manuals are kept on HRSD's internal Sharepoint site and hardcopies are kept at each STP facility for easy access. HRSD is moving toward utilizing an electronic system to store and manage O&M procedures and information called Operations Treatment Information System (OTIS).

2.11.6 Resource Management

The Chief(s) of Treatment and each treatment plant manager are responsible for updating SOPs, O&M Manuals, and additional plant specific plans as appropriate. Appendix A-10 through A-19 details personnel related to each treatment plant.

2.11.7 Process for Continuous Improvement

HRSD is moving toward an electronic system called OTIS for storage of O&M manuals to allow for easier and searchable access by operators as well as increase in efficiency of the update process. OTIS has been successfully implemented at one STP facility and HRSD will continue to evaluate implementation of this system at other STP facilities.

2.11.8 Implementation Plan

None identified.

2.12 Sewage Treatment Plants Response Plans

2.12.1 Program Definition and Purpose

Response Plans were developed for each HRSD work center so that employees have knowledge of what to do in case of a fire, chemical spill, or other emergencies. Each work center's response procedures are tailored for that particular facility. The Safety Division reviews HRSD Response Procedures on an annual basis to ensure the procedures remain accurate.

2.12.2 Goals and Performance Measures

The goals for the STP Response Plans are to provide treatment employees the knowledge to safely perform in an emergency situation by documenting:

- Fire and Evacuation Procedures
- Chemical Release Procedures
- Wastewater Spill Procedures
- Regulatory Reporting Procedures
- Emergency Contact Lists
- Related Safety Procedures

Goals		Performance Measures	Target Value
Response Plan Training	Employees will be trained annually on Response Plans to ensure adequate knowledge of what to do in case of fire, chemical spill, or other emergency.	(No. Work Center Response Plan Training Sessions held during year/ No. of Work Centers) *100	100%

2.12.3 Program Description / Components

2.12.3.1 Critical Valves

Work centers that have chemicals mark critical valves as indicated on chemical system diagrams. The marking system makes the critical valves easy to identify.

2.12.3.2 Wastewater Spill Response

Each work center's Storm Water Pollution Prevention Plan (SWP3) includes diagrams of each plant and location of storm drains. Response Plans contain chemical line diagrams and critical valve locations and documents procedures for mitigation, containment, clean-up and reporting of wastewater releases.

2.12.4 Training

HRSD employees receive annual training on their work center's Response Plan. The HRSD Safety Division conducts this annual training. Supervisors train all new employees on Response Plan. Information Management

Each HRSD work center has the most up-to-date version of that work center's Response Plan. The Response Plan is placed in the work center's information area for employee access. Work center Response Plans are also available on the HRSD's Sharepoint site.

2.12.5 Resource Management

The Safety Division updates HRSD STP Response Plans on an annual basis so that the procedures remain accurate and current.

2.12.6 Process for Continuous Improvement

The Safety Division evaluates work center Response Plans at least annually during safety inspections. This audit includes checking if the most up-to-date Response Plans are available at the work center, fire extinguishers, fire protection systems, exits, marking of critical valves, spill/leak control supplies/equipment, and signage.

2.12.7 Implementation Plan

None identified.

2.13 Sewage Treatment Plants Storm Water Pollution Prevention Plans

2.13.1 Program Definition and Purpose

Each of HRSD's sewage treatment plants has a no-exposure certification for storm water. The plant maintains this certification by adhering to its Storm Water Pollution Prevention Plan (SWP3). This plan documents facility specific potential spill sources, best management practices (BMPs) for dealing with spills, and is a central source to document actual spills, training, and inspections.

2.13.2 Goals and Performance Measures

The goals for site specific SWP3's are the following:

- Identify industrial activities that have the potential to contaminate storm water
- Communicate best management practices for storm water pollution prevention to staff
- Provide storm water drainage plans for each site

2.13.3 Program Description / Components

2.13.3.1 Drainage Maps and Discharge Sources

Facility SWP3 contain site drainage maps to identify locations that drain to a specific storm water drain. This facilitates containment set up.

2.13.3.2 Log of Spills and Leaks

Included in the SWP3 is a log of all significant spills and leaks that entered the storm drain system within the past three years. This log is maintained by each treatment plant.

2.13.3.3 Pollutant Source Identification and BMPs

Potential storm water pollutant sources are identified in each facility's SWP3. Existing management practices for each are documented and communicated to employees. Inspections

Inspections of each treatment plant storm water system are conducted regularly as a condition assessment. Unloading/loading areas are also inspected for cleanliness in addition to, chemical and fuel tank inspections. Inspections are documented as part of the plant's records or SWP3.

2.13.4 Training

All plant personnel are required to attend an initial 'new hire' and annual refresher of storm water regulations, spill prevention and response, site specific housekeeping procedures and material management practices. Training attendance is documented as part of the SWP3.

2.13.5 Information Management

Each HRSD facility maintains its own SWP3. The SWP3 will be placed in the work center's information area for employee access.

2.13.6 Resource Management

A Pollution Prevention Team is established for each treatment facility. The team can consist of plant managers, superintendents, operators, scientists, and the permits manager. The responsibilities of each team member are documented as part of the SWP3.

2.13.7 Process for Continuous Improvement

The SWP3 is updated by the plant manager periodically based on need. A revisions log is maintained within the SWP3 that includes dates of updates. Best management practices are evaluated regularly and after each event.

2.13.8 Implementation Plan

None identified.

2.14 Sewage Treatment Plants Short Term Wet Weather Operational Plan

2.14.1 Program Definition and Purpose

HRSD has implemented a Short Term Wet Weather Operational Plan (STWWOP) outlining HRSD's protocol in the near-term for responding to peak flow events and procedures for improvement, training, and maintenance of the plan.

2.14.2 Goals and Performance Measures

The goals of the STWWOP are to:

- Provide treatment plant operators with near-term procedures for responding to peak flow events
- Maintain treatment during and after a wet-weather event and maximize the processing of wastewater

2.14.3 Program Description / Components

The HRSD Sanitary Sewer (SS) System and the HRSD STPs have an outstanding record of performance. As with any sanitary sewer system, system pressures and flows can increase dramatically during rain events.

HRSD and the Localities are developing a Regional Hydraulic Model (RHM) and Regional Wet Weather Management Plan (RWWMP). The output of this work will be to identify a target Level of Service (e.g., 2-year, 5-year, or 10-year peak flow recurrence) for upgrading the system. The actual flow capacity requirement to meet any of these Level of Service (LOS) standards has not been determined so the ability to meet these standards is unknown. Until that LOS work is completed, HRSD and the Localities will optimize the existing infrastructure to limit the occurrence of sanitary sewer overflows (SSOs) and treatment plant bypasses or upsets. The Short Term Wet Weather Operational Plan provides the details on HRSD's protocol in the near-term for responding to peak flow events and procedures for improvement, training, and maintenance of the plan.

2.14.3.1 Current Systems

All of HRSD's treatment plants provide at least secondary level of treatment and several of these facilities currently provide biological nutrient removal. In 2006, the DEQ initiated new regulations that included a mass limit by river basin for both nitrogen and phosphorus. To achieve these new limits, major upgrades are required at four HRSD plants on the James River and one plant on the York River. The first of these upgrades are scheduled to be completed in 2011. The second phase of upgrades will be completed by 2017.

HRSD's mission is to protect public health and the waters of Hampton Roads by conveying and treating wastewater effectively. As part of this mission, HRSD strives to maintain treatment during and after a wet weather event and process as much wastewater as feasibly possible.

2.14.3.2 Treatment Plant Specific Actions

The following general standard operational plan has been developed to in address wet weather events. Several of the plants have also developed their own plant-specific wet weather procedures that complement the general operational plan.

<u>General Procedures</u>

- Conduct a preventive maintenance (PM) program, to maximize available equipment and tanks.
- Make provisions for additional personnel to be on call or preferably on-site during a wet weather event. Verify that all chemical storage tanks are sufficiently full to address the demand during the wet weather.

- Test the on-site backup power monthly.
- Verify that there is sufficient fuel to run the on-site backup power system for the anticipated duration of the event.

Procedures per Unit Process

Preliminary Treatment: Screening and Grit Removal

- If screens are equipped to run automatically based upon level, they may be left in the "automatic" mode.
- If screens are run based upon a timer, they can be switched to "continuous run" mode when the flow increased above the normal peak flow.

Primary Clarification

- Place any available offline tanks online during peak flow events, as needed.

Biological Process

- Place any available offline tanks online during peak flow events, as needed.

Secondary Clarification

- Place any available offline tanks online during peak flow events, as needed.
- Check sludge blankets and add coagulant or polymer to facilitate solids settling, if necessary.
- Evaluate reducing return activated solids (RAS) pumping.

Disinfection

- Place any available offline tanks online during peak flow events, as needed.
- Continue chlorination.

2.14.4 Training

To ensure that the HRSD's personnel are effective and prepared in managing an emergency situation, HRSD provides ongoing training. This training provides the means for those involved in operating the system during peak flow events to acquire skills that fulfill their roles. On-going formalized operational training is provided by HRSD's apprenticeship program (see Section 3.2.3.4). Treatment Plant Operators and Interceptor Technicians graduate from this program with a Virginia Department of Labor (VDOL) licensed Journeyman's card and gain the experience and knowledge needed to react and respond to the various issues that may arise from a multitude of operational scenarios. Implementing the STWWOP also helps to determine where enhancements are necessary, so that revisions to the plan can be made accordingly.

2.14.5 Information Management

The STWWOP is kept at each STP for ease of access. It is also available electronically on HRSD's internal SharePoint site.

2.14.6 Resource Management

Staffs at each treatment plant are responsible for implementation of the STWWOP. The Chiefs of Treatment Divisions (North and South Shore) are responsible for ensuring implementation. Appendix A-10 through A-19 details personnel related to each treatment plant.

2.14.7 Process for Continuous Improvement

The Chiefs of Treatment (North and South Shore) and Treatment Plant Managers evaluate plant and operator performance following major peak flow events. Opportunities for improvement are identified to be used in future wet weather events. Improvements may be as simple as making staffing adjustments or may involve other modifications. For instance, at the Boat Harbor Treatment Plant, a limitation was identified in a specific portion of the hydraulic profile that could be addressed by a minor construction project (which has been completed) to increase the height of a channel wall.

The STWWOP document is reviewed as people, processes and systems change. Review of the plan typically occurs when there is a change in the wastewater system.

2.14.8 Implementation Plan

None identified.

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3. SUPPORT PROGRAMS

3.1 Safety

3.1.1 Program Definition and Purpose

The purpose of HRSD's Safety Program is to conduct all operations and maintenance activities in a safe manner to eliminate or reduce accidents, personal injuries and property damage. The HRSD Safety Division is responsible for the overall safety program of all departments. HRSD performs routine safety inspections and ensures that all of HRSD's facilities and workers are meeting safety requirements.

3.1.2 Goals and Performance Measures

The goals of HRSD's safety program are to:

- Eliminate or reduce accidents, personal injuries, and property damage;
- Ensure a safe place to work for all employees;
- Provide education and safety training to all employees; and
- Provide appropriate Personal Protective Equipment (PPE) to ensure safety in job duties.

Goals		Performance Measures	Target Value
Recordable Incidents	Reduce accidents, injuries, and property damage to protect employees by implementing proactive safety policies and procedures.	Safety Manager will keep record of all OSHA Reportable accidents.	Fewer than 60 OSHA Reportable injuries per year
Lost Time accidents	Reduce accidents, injuries, and property damage to protect employees by implementing proactive safety policies and procedures.	Safety Manager will keep record of all Lost Time accidents.	Fewer than 10 lost-time accidents per year
Work Safety	To Maintain safe work environment the Safety Division conducts safety inspections on a routine basis.	(Routine Quarterly safety inspections performed per year / Four safety inspections to be performed per year) X 100%	100%

3.1.3 Program Description / Components

HRSD's Safety Program includes:

- Confined Space Entry;
- Lock Out/Tag Out;
- Personal Protective Equipment;
- Hazard Communication;
- Respiratory Protection;

- Hearing Conservation;
- VDOT Flagging Certification;
- Hot Work Permit;
- Excavation Safety;
- Asbestos Awareness;
- Safe-Driving
- Electrical Safety Program, and
- Emergency Response Procedures.

HRSD also has a task force to ensure the security of all HRSD facilities. The HRSD Safety Division is responsible for the overall safety program of all departments. They perform routine safety inspections and ensure that all of HRSD's facilities and workers are meeting safety requirements. They provide many levels of training to employees on safety, health, and first aid. The Safety Division oversees the security of all facilities and the overall disaster preparedness efforts, including the hurricane plan. The complete safety plan is detailed in the HRSD Safety Standard Operating Procedures (SOP). This SOP is updated as needed.

HRSD has a Safety Team consisting of employees appointed by their department directors. This team acts as an advisory group on safety policies and issues, provides general direction and input to the Safety Section on programs and keeps their departments informed about safety issues.

3.1.3.1 Safety Procedures

Safety rules describe required practices and procedures for safely performing routine and non-routine activities in a safe manner. HRSD personnel are responsible for familiarizing themselves with all safety rules and are mandated to follow all HRSD safety rules in the performance of their daily activities while at HRSD facilities or when representing HRSD off site. Supervisors are responsible for: informing, explaining, and publicizing all safety rules to their personnel; enforcing observance of all safety rules by HRSD personnel; and ensuring each employee has access to a copy of HRSD's safety rules. All current safety rules and practices are defined in HRSD's Safety SOP. The Safety Section is responsible for developing programs and procedures such as:

- Development of HRSD programs to insure compliance with OSHA requirements;
- Safety training;
- Safety inspections;
- Accident investigations;
- Auto Accident and Decision Driving Training
- Pulmonary function testing;
- Respirator fit testing;
- Audiometric testing;
- Air sampling and environmental audits;
- SARA Title III submissions;
- Development of emergency response procedures;
- Documentation of training, sampling, inspections, and medical information;
- Issuance of Safety Notices;
- Crisis management functions as outlined in HRSD's Workplace Violence Prevention Policy;
- Facility security and monitoring;

- Communication of relevant safety information to all employees; and
- Asbestos inspections, air sampling and limited removal/clean-up activities.

3.1.3.2 Personal Protective Equipment

HRSD is committed to creating the safest environment possible for its employees. HRSD provides all employees with job-specific Personal Protective Equipment (PPE) upon initial hire and replaces equipment on an as-needed basis.

3.1.4 Training

Safety training is an ongoing requirement for HRSD employees. Regular training is provided to safely perform all types of activities, including confined space entry, traffic control, electrical maintenance, pump station operations and maintenance, trenching and shoring. Employees often go through on-the-job drills to assess their knowledge in addressing dangerous situations and to ensure they have been adequately trained. Operations work centers have monthly safety training meetings to provide continuous safety training on task specific job duties and to maintain a high level of safety awareness. All employees must attend a new employee safety orientation. This training is one full day for interceptor and treatment employees and half a day for office staff.

HRSD's safety training is provided through several different methods:

- Manufacturer training;
- On-the-job training;
- In-house classroom training; and
- Industry-wide training (including webcasts).

A training calendar is published yearly to track all safety related training and certifications. If an incident occurs, HRSD may deviate from training calendar to provide additional incident specific training to increase employee awareness.

3.1.5 Information Management

Records of employees' attendance at safety training are kept in a training database and in hard copies within personnel files. Training and medical records are kept for minimum of 30 years after the employee's last date of employment. Each work center also maintains hard copy files for safety and job-related training. Employees are scheduled for refresher training or to renew certifications as required.

The Safety SOP document is maintained on the HRSD Sharepoint site.

3.1.6 Resource Management

The HRSD Safety Division is responsible for the overall safety program of all departments. They perform routine safety inspections and ensure that all of HRSD's facilities and workers are meeting safety requirements.

HRSD's safety program is overseen by South Shore's Chief of Treatment and managed full time by a Safety Manager. The Safety Manager is responsible for MOM related requirements. There are two full time Industrial Hygienists and one Safety Coordinator designated to the safety program.

The Safety Manager performs budgeting, reporting, and managerial tasks. Training, sampling, and other safety related duties are split between all employees in the Safety Division. The Safety Organization chart is shown in Appendix A, on page A-20.

HRSD's safety program requires various sampling equipment including but not limited to air monitors, audiometers, spirometers, etc.

3.1.7 Process for Continuous Improvement

HRSD strives to continually evaluate and update its Safety Program as needed. This is done through employees recognizing needs for improvements, annual planning/review within the Safety Division, process improvements, chemical substitutions or eliminations when possible, a Safety Recognition Program for employees, periodic updates to Safety Standard Operating Procedures (SOP) and training calendars.

HRSD is currently working on updating its recordkeeping process which will also include its safety records. This will be done through a Human Resources Management System (HRMS) reference in Section 3.2 of this plan. Records of new employee safety training and specific job duty training will be stored in this new system.

3.1.8 Implementation Plan

Program Milestone	Timeframe
Safety Division Planning/Review Day	Held Annually
Updates to Safety SOPs and Training Calendar	Updated Annually
Human Resources Management System	Implemented by December 2010

3.2 Training

3.2.1 Program Definition and Purpose

Comprehensive employee training programs and generous educational assistance benefits have contributed greatly to HRSD's success. HRSD embraces a continuous learning philosophy that requires all employees to complete the training necessary to ensure the safe and effective performance of duties.

3.2.2 Goals and Performance Measures

The goal of HRSD's training program is to train all employees to perform job duties safely and effectively and provide training opportunities for career advancement.

Goals		Performance Measures	Target Value
Employee Training	All employees are trained adequately to perform their duties.	Total training hours (Prof. dev, Apprentice, safety, college, manufacturer, short school, etc)/# FTE (filled positions)	40 hours/ year per FTE

3.2.3 Program Description / Components

Comprehensive employee training programs and generous educational assistance benefits have contributed greatly to HRSD's success. HRSD embraces a continuous learning philosophy that requires all employees to complete the training necessary to ensure the safe and effective performance of duties. Each new employee must attend the standard New Employee Orientation. Subsequent training is based on individual needs, position requirements and advancement goals. Components of the Training Program which are described below include:

- Safety Training;
- Skills Training Program;
- Technical Training Programs;
- Apprenticeship Program;
- College Tuition Reimbursement;
- Leadership Training;
- Team Training;
- Quality Improvement Program; and
- Quality Improvement Training.

3.2.3.1 Safety Training

Safety training is an ongoing requirement for HRSD employees. Regular training is provided to safely perform all types of activities, including confined space entry, traffic control, electrical maintenance, pump station operations and maintenance, trenching and shoring. Employees often go through on-the-job drills to assess their knowledge in addressing dangerous situations and to ensure they have been adequately trained.

HRSD's safety training is provided through several different methods:

- Manufacturer training;
- On-the-job training;
- In-house classroom training; and
- Industry-wide training (including webcasts).

Operations work centers have monthly safety training meetings to provide continuous safety training and maintain a high level of awareness. Records of employees' attendance at safety trainings are kept and employees are scheduled for refresher training or to renew certifications as required.

3.2.3.2 Skills Training Program

HRSD has an extensive training program to teach the individual skills needed to be effective in all facets of work at HRSD. Training is provided by experienced, in-house staff and outside instructors. In addition, employees have opportunities to attend workshops and Webcast seminars.

HRSD helps its employees achieve various licenses and certifications that enhance their professional credentials such as wastewater operator licenses, commercial driving licenses and many others that may be required of the employee. Some employees receive a bonus or higher pay level for earning certain certifications that are required for their positions.

3.2.3.3 Technical Training Programs

Technical training and refresher training requirements vary with each position. Each department funds the training of its employees, which can include participating in off-site classes or seminars, attending conferences, obtaining a college degree and meeting professional licensing requirements. HRSD also organizes on-site classes for employees to improve their technical knowledge, skills and abilities.

3.2.3.4 Apprenticeship Program

HRSD created the nation's first wastewater industry apprenticeship program to maintain excellence in the workforce. The nine apprenticeship programs are custom-designed to help individuals receive the occupational training and experience needed for a successful career with HRSD. The apprenticeship programs are recognized and approved by the Virginia Department of Labor and Industry. The program is administered through an internal Apprenticeship Committee. HRSD's nine apprenticeship programs (Plant Operator, Maintenance Operator, Interceptor Technician, Instrument Specialist, Electrician, Equipment Technician, Carpenter, Machinist, and Auto Technician) are a combination of on-the-job training and related class-room instruction. All of these programs are structured for completion in four to five years.

Participants in the program receive annual increases as incentive to successfully complete the program. Operator apprentices obtain the skills and credits needed to earn their licenses and accompanying bonuses. All apprentice positions require successful completion of the apprenticeship program or equivalent program as a condition of continued employment.

3.2.3.5 College Tuition Reimbursement

To provide an incentive for employees to enroll in courses provided by local colleges, HRSD will reimburse tuition fees to qualified employees who attend college to earn a degree needed to meet job requirements or prepare for advancement. HRSD reimburses employees for each course they successfully complete.

3.2.3.6 Leadership Training

HRSD is committed to training leaders and has in-house Quality Facilitators and outside consultants who train employees in leadership and management type skills. HRSD's Leadership and Management Program (LAMP) course has become a cornerstone of the organization.

3.2.3.7 Team Training

HRSD's Roadmap Facilitators train all supervisors and employees who are team members or potential team members on a seven-step problem-solving process called the Roadmap process. This three-day course teaches students through a step-by-step teaming process. Throughout the years, these teams have done a significant amount of work to make substantial improvements at HRSD.

3.2.3.8 Quality Improvement Program

HRSD has been a Quality Improvement organization since the early 1990s. HRSD employees complete extensive training on integrating quality improvement practices into the workplace. In-house facilitators and outside consultants continually train HRSD personnel to recognize and implement organizational and self-improvement activities. The Quality Steering Team ensures the program continually meets the goals of the organization.

3.2.3.9 Quality Improvement Training

Workplace Facilitators teach all new employees the basics of quality improvement through the "Your Role in Quality" course. This one-and-a-half-day course explains what quality improvement is about and culminates with each employee developing a personal action plan to improve at least one element of their work.

3.2.4 Training

Staff members who administer training programs are provided on-the-job training for specific job responsibilities.

3.2.5 Information Management

Employee's training records are currently maintained as hard copies in employee personnel files in Work Centers as well as in Human Resource Department.

3.2.6 Resource Management

Three full time employees working under the direction of the Training Manager are dedicated to training and employee personnel tracking. Separate resources are dedicated to safety-related training. Work center superintendents also provide training to employees on an as needed basis. The Training Manager reports to the Chief of Human Resources.

3.2.7 Process for Continuous Improvement

A new database is being developed called Human Resource Management System (HRMS) to store, maintain, and access human resource files. The software will give a synopsis of completed training for each employee.

3.2.8 Implementation Plan

Program Milestone	Timeframe
Upgrade to HRMS (training records)	December 2010

3.3 Information Management Programs

3.3.1 Program Definition and Purpose

HRSD uses a variety of information management systems to accomplish its mission. Information management systems support management, operations and maintenance activities by providing for the storage, retrieval and analysis of a wide variety of data. The significant systems are outlined in the following sections.

3.3.2 Goals and Performance Measures

Information systems support other management, operations and maintenance activities. The following performance measures are under development (see Section 3.3.7):

Goals		Performance Measures	Target Value
WAN (Wide Area Network) Reliability	Provide Network Integrity and Systems Availability	Maintain Information Systems Uptime / Availability	To be determined
WAN Security	Provide Network Security Platform and Protocols	Number of unauthorized Intrusions through Secure Platforms and Protocols	To be determined

3.3.3 Program Description / Components

3.3.3.1 Asset Management Databases

3.3.3.1.1 Geographical Information Systems (GIS)

In an effort to bring added value to the way the Hampton Roads Sanitation District (HRSD) conducts business, HRSD developed a Geographic Information System (GIS).

The GIS provides an inventory of the interceptor system consisting of force mains, gravity mains, pump stations, pressure control valves, air release valves, isolation valves, and other appurtenances. The interceptor system, identified as the most critically needed GIS data element, has been captured; and is kept up-to-date with new construction, repairs, relocations, and other system changes. Other data elements are also being actively collected to support different business processes. These include 'process-support' data elements such as HRSD customer locations; and 'operational-support' data elements such as valve operating details.

As the GIS evolves, HRSD continues to develop and deploy software applications to support HRSD business functions. In this regard, both desktop applications and web browser-based applications have been deployed. These include general informational applications, as well as more elaborate applications supporting hydraulic modeling and other data analysis capabilities. Mobile GIS applications to support field personnel are being planned, aiming to both provide information to field personnel where/when they need it, as well as to facilitate the immediate capture of information in the field.

The GIS also aims to spatially enable other information systems via system integrations. The integration of GIS with the Computerized Maintenance Management System (CMMS) and the Enterprise Project Management System are currently being developed; and other system integrations are planned.

3.3.3.1.1.1 Goals of the GIS are:

- Improve business processes – By adding spatial awareness to the various information systems managed by different HRSD departments.
- Improve decision making – By presenting information in its spatial context
- Improve and maintain knowledge and protection of district investments – By maintaining an accurate inventory of HRSD infrastructure
- Improve communication with stakeholders – By making information accessible and useful

3.3.3.1.2 Pretreatment Information Management System (PIMS)

PIMS is a relational database utilized by the Pretreatment & Pollution Prevention Division to store industrial and commercial facility information and compliance data. PIMS has a direct link with Laboratory Information Management System (LIMS) to receive HRSD sampling and analytical data. Surcharge billing information can be exported directly to HRSD's billing system.

PIMS not only stores facility information such as data and contact information, but also calculates and stores compliance data and surcharge information. Information concerning sampling points, permit information and limits, industry monitoring requirements and enforcement actions taken by HRSD are all stored in the database. PIMS tracks all related facility correspondence and determines when industry reports are late or incomplete. PIMS provides a comprehensive database to manage data that describe industrial users, as well as the volume and pollutant concentration of industrial discharges. Also, all archived data from the previous database is available within PIMS.

3.3.3.1.3 Treatment Information Management System (TIMS)

The treatment plants collect thousands of operating data points each week for good operational management of the wastewater treatment system. The purpose of the TIMS is to manage treatment plant specific data and to transfer that data to LIMS to be stored in a long-term, secure, distributed environment for the generation of a variety of reports.

Daily Plant Operations Reports (DPOR spreadsheets) are legal documents verifying the daily operation of the treatment plant. HRSD is responsible for maintaining these documents for state, federal and public review. The DPOR portion of the data management system allows the plants to properly record and manage their operations on a day-to-day basis. TIMS transfers data to LIMS daily that are required to generate Discharge Monitoring Reports (DMRs) and Monthly Plant Operations Reports (MPORs) for storage and report creation while other DPOR data are stored in TIMS.

3.3.3.1.4 Laboratory Information Management System (LIMS)

The Central Environmental Laboratory (CEL) LIMS is part of HRSD's integrated, interdepartmental information management systems. TIMS and the Pretreatment Information Management System (PIMS) comprise the remainder of these systems. LIMS provides storage for more than a quarter million laboratory results annually as well as treatment plant operational data that is used to create reports. The data are used for regulatory and operational purposes by several HRSD departments and divisions. LIMS is designed to follow applicable US EPA protocols and good automated practices for sample and data management. The CEL uses LIMS for many aspects of data and sample management. LIMS functions include automated generation of analytical requests and sample labels, sample receipt, automated data transfer from instrumentation, data validation and approval, generation of data reports and data storage.

LIMS transfers data into Treatment Division's Excel spreadsheets used in TIMS. Hourly data generated at each facility is recorded and used to perform flow and process calculations. LIMS serves as a permanent repository of data for historical purposes and for cross plant reporting. In addition, it ensures the quality and completeness of collected information. Data also are automatically transferred from LIMS to PIMS.

LIMS is the system of record for all data needed to generate MPORs and DMRs. DPOR data transferred from TIMS to LIMS is integrated into the MPORs. The MPORs organize both DPOR data and laboratory analytical data from the treatment plants. The MPOR data is ultimately organized into both DMRs for the state and Yearly Plant Operating Reports (YPORs) for yearly budget and operational assessments.

3.3.3.1.5 Computerized Maintenance Management System (CMMS)

HRSD uses the Infor CMMS software product version 8.2 as its computerized maintenance management system (CMMS). The CMMS is a comprehensive system that contains the following:

- Asset registry
- Process and asset hierarchy
- Asset attribute data
- Maintenance history
- Replacement and repair parts for assets (in process-where applicable)
- Preventive maintenance and inspection schedules
- Detailed maintenance activities

The Infor CMMS assigns a unique number to each asset, which is used as the basis for tracking the asset throughout its life cycle. Each asset is associated with a core set of data attributes that are standard across all asset types or asset classes. Core asset data attributes include asset class, criticality, installed date, serial number, manufacturer, model, etc. Additional and specific data attributes are associated with each asset based on the asset class. For example, assets identified with an asset class of 'pump' could contain an additional 40 data attributes for tracking pump related information such as, capacity, pump size, impeller diameter, etc. Each asset class has a defined list of the appropriate additional data attributes.

Work orders are used to track all maintenance activities for assets. The complete maintenance history can be viewed on the History tab for each asset. From the History tab, system users can link to each and every work order associated with the asset. The work order contains the details of who performed the maintenance, when the work was performed, how long the maintenance activity took, the parts used in the maintenance activity (if applicable), whether the work was performed during over time or normal time, what maintenance procedure was followed, and any comments provided by maintenance personnel.

HRSD has defined preventive maintenance (PM) schedules for all assets. These schedules identify the asset, the due date, the frequency, estimated time required, and personnel required to perform the PM or inspection. Each PM schedule is also associated with detailed maintenance procedures or task instructions. The task instructions include safety precautions, tools, parts, materials, test equipment, along with step-by-step procedures for completing the maintenance activity.

HRSD is implementing Infor CMMS in a phased manner. This system records and keeps track of maintenance records, provides information to assist staff in determining what activities need to be taken in response to problems, and identifies normal maintenance and schedule maintenance to be done. An inventory capability is part of the system. The comprehensive nature of this large system requires that it be implemented in a phased basis over a number of years to ensure that each new phase is done correctly, quality information is entered, and personnel are trained in its use.

Pertinent Interceptors data will be tracked through the CMMS which will be linked to the GIS mapping system. This link will allow information such as problems in the interceptor systems and pump stations to be displayed graphically on maps. This information will help determine when sections of pipe may need to be rehabilitated. HRSD maintenance workers will have laptop computers in their trucks to be able to electronically download information, forms and drawings, as well as input what maintenance activities are performed from the field.

3.3.3.1.5.1 Goals of the CMMS are:

- Reliability - Increase equipment reliability by performing planned maintenance and reducing corrective (emergency and unplanned) maintenance;
- Downtime - Reduce equipment breakdowns and failures and reduce need for repairs or replacements;
- Management - Provide a convenient and flexible tool for management of maintenance;
- Planning - Promote the efficient scheduling of maintenance;
- Scheduling - Promote balanced workloads and job rotation of maintenance personnel;
- Records - Provide records containing the operating and maintenance history of the equipment;
- Training - Promote personnel training by using written instructions and procedures when performing maintenance;
- Safety - Promote safety by following procedures for maintaining equipment and by familiarizing personnel with safety hazards encountered; and
- Costs - Reduce costs by utilizing personnel, material, chemicals and time more efficiently.

3.3.3.1.6 Replacement Planning Model

The Replacement Planning Model (RPM) is a financial planning tool that uses asset inventory information and asset useful live estimates to forecast long term refurbishment and replacement (R&R) requirements. For each asset class, an expected useful live is assigned along with replacement cost functions and applicable refurbishment cycles. For instance, a pump may have a useful life of 15 years with a major refurbishment cycle at 7 years consisting of a major rebuild. The RPM uses the asset class information along with installation dates to develop R&R estimates by asset class and then sums those transactions to arrive at a forecast of R&R requirements by year. This forward looking projection will be used to inform HRSD's capital plan. Specific projects will be identified through operational analyses and condition assessment data.

3.3.4 Training

Classroom training is provided periodically for various Information Management Systems training. Training manuals for these systems are also loaded for viewing on HRSD's Sharepoint site.

GIS and CMMS training are offered through the Apprenticeship Program and in-house as required.

Software and Hardware training is offered on an as-required basis for those who need it within the Information Services department.

3.3.5 Information Management

HRSD utilizes advanced server technology to maintain a reliable and efficient network. Servers, software, and computer upgrades are continuously being evaluated to keep up with current technology.

3.3.6 Resource Management

Information Systems is divided into three divisions – Customer Service Information (68 employees), Enterprise Data Services (14 employees), and Information Technology (19 employees) who report to the Director of Information Services. Organizational chart can be viewed in Appendix A, page A-5.

3.3.7 Process for Continuous Improvement

GIS information has been loaded to a web based application for internal and external users.

The LIMS platform is being updated. After implementation of the new LIMS, upgrades to PIMS will be addressed.

Systems and processes for tracking network integrity/system availability and WAN security are under development.

3.3.8 Implementation Plan

Process for Continuous Improvement	Implementation Plan
GIS information accessible via web based software	Implemented: March 2010
LIMS updates	Implementation by 2012
PIMS updates	Implementation in 2013 – Post LIMS/EDMS Phase
CMMS Upgrade	Budgeted for FY-11
WAN Reliability Performance Measures	Implementation by 2012
WAN Security Performance Measures	Implementation by 2012

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3.4 Miss Utility – "Call Before You Dig"

3.4.1 Program Definition and Purpose

HRSD participates in the Miss Utility program to prevent damage to its underground assets by locating and marking underground lines prior to construction or other excavations that may occur.

3.4.2 Goals and Performance Measures

HRSD has the goal of accurately marking the underground lines to ensure that HRSD facilities are not damaged. HRSD responds to all types of types of Miss Utility tickets within the designated time required by the program.

Goals		Performance Measures	Target Value
Prevent damage to underground lines	To prevent damage to underground lines the location of system lines must be marked in a timely manner once a Miss Utility ticket has been issued.	(No. of Miss Utility "no shows"/ Total number of tickets received)	0

3.4.3 Program Description / Components

As a utility owner, HRSD is required by the State of Virginia to participate in a state wide Miss Utility program. Anyone preparing to excavate is required by law to call the State Corporation Commission to have all underground utilities located and marked before digging. The State coordinates the calls and notifies all utilities of possible conflicts. The Virginia Utility Protection Services program has been dubbed "Miss Utility". Miss Utility issues a ticket depending on the type of job or excavation. The types of tickets are designated as designer, regular, update, emergency, meeting or special project tickets. HRSD is required to respond to all tickets received and is typically required to mark its utilities within 48-72 hours (or sooner depending on the type of ticket) of the notification. If the project is under design and physical survey of the utilities is needed, then a "designer" ticket may be called and HRSD will have up to 15 working days to mark the utilities in conflict. More detailed information on the requirements and regulations of the Miss Utility program can be found in Virginia's *Professional Excavator Manual* prepared by Virginia State Corporation Commission.

HRSD utilizes Miss Utility's Polaris web-based ticketing tool to manage tickets, meetings, and other aspects of this program. HRSD has full time staff dedicated to performing these activities. The marking crew utilizes record drawings, tracer wire, line of sight and other location technologies to provide the location of the underground utility.

HRSD follows best practices for markings as outlined in the *Virginia Underground Utility Marking Standards* prepared by Virginia State Corporation Commission. Please reference to this manual for further detail.

3.4.3.1 Enforcement Program

If HRSD is not called and a contractor's crew is seen working in the vicinity of HRSD's facilities, the contractor can be forced to stop working and may be reported to the Virginia State Corporation Commission. If an HRSD line is damaged in the process of performing work that had not been reported to Miss Utility or was improperly marked, the contractor is liable for any repairs to the system. An insurance claim can also be filed to recover repair expenses not assumed by the contractor. Complete and detailed enforcement rules can be reviewed in Virginia's *Professional Excavator Manual*.

3.4.3.2 Line Location for Third Parties

HRSD may own pipes in areas where the Miss Utility program does not apply or a contractor may be working on or near a plant or pump station and request that underground utilities be marked. Upon request, HRSD may mark the utilities in these areas. This service is provided to ensure the integrity of HRSD's pipelines and structures.

3.4.4 Training

On-the-job training is provided for technicians who perform this work.

3.4.5 Information Management

HRSD utilizes Miss Utility's Polaris web-based mapping tool to manage tickets, meetings, and other aspects of this program. The GIS and the Meridian drawing system are used as reference sources.

3.4.6 Resource Management

The HRSD Miss Utility program is operated under the direction of the North Shore and South Shore Chief of Interceptors. Both of these chiefs report to the Director of Operations.

The North Shore resources used in this program are: one full-time Miss Utility Clerk with a trained backup, one Interceptor Tech, one Locator, and three sets of locating equipment

The South Shore resources used in this program are: one full-time Miss Utility Clerk with a trained backup, two Interceptor Techs, and three sets of locating equipment

3.4.7 Process for Continuous Improvement

The technicians back-reference the actual locations with the HRSD GIS and any significant variations are corrected.

The Polaris software is also updated based on actual field data.

Obtaining GIS access for the technician's laptops is being pursued to assist them in the line marking.

3.4.8 Implementation Plan

None identified.

3.5 Flow Acceptance Process

3.5.1 Program Definition and Purpose

HRSD and the Localities, in consultation with DEQ, have developed a refined flow acceptance process for the purpose of reviewing proposed new connections or major modifications to existing connections to the regional sanitary sewer system. This refined process has been in place since summer of 2008. The process allows for the orderly and consistent review of new service requests and coordinates the review process between the Localities, DEQ and HRSD.

3.5.2 Goals and Performance Measures

The goals of the flow acceptance process are to:

- Allow for adequate long term capacity planning in the system;
- Track new connections and provide for adequate planning; and
- Provide a check opportunity for HRSD and DEQ to ensure developments meet regional design criteria.

Goals		Performance Measures	Target Value
Flow Acceptance	To allow for adequate long term capacity planning in the system, all approved Flow Applications must be consistent with the established Facilities Plan.	Number of Flow Applications Processed	Trend
Conditional Flow Acceptance	Conditional Flow Acceptance Letters are issued in areas with known capacity challenges	Number of Conditional Flow Acceptance Letters Issued	Trend

3.5.3 Program Description/Components

HRSD has the legal authority to accept and/or reject flows from satellite municipal collection systems by Section 40 of the Enabling Act. It is HRSD's responsibility to maintain an effective flow acceptance process. HRSD and the Localities, in consultation with DEQ, has developed a refined flow acceptance process for the purpose of reviewing proposed new connections or major modifications to existing connections to the regional sanitary sewer system. The highlights of this approach are as follows:

- The Flow Acceptance Letter is required by the Virginia DEQ prior to issuing the Certification to Construct.
- HRSD requires a flow application to be submitted by the Locality for all Flow Acceptance Letter requests.
- The HRSD Flow Acceptance Letter will be issued prior to the Locality Flow Acceptance Letter although the review process can be in parallel.
- The HRSD Flow Acceptance Letter will be issued to the Locality for a specific point in the HRSD Interceptor System and at a specific flow rate.
- The criteria for issuance of a Long Form Flow Acceptance Letter are as follows:
  - For gravity systems, flows greater than 40,000 gallons per day (average daily flow); or

  - For pumped connections to a gravity system, design pump rates greater than 25 gallons per minute (gpm); or
  - For pumped connections to a pressurized system, flows greater than or equal to 2,000 gallons per day (average daily flow).
- The criteria for issuance of a Short Form Flow Acceptance Letter are as follows:
  - For pumped connections to a gravity system, design pump rates less than or equal to 25 gpm but with flows greater than or equal to 2,000 gallons per day (average daily flow); or
  - For pumped connections to a pressurized system, flows less than 2,000 gallons per day (average daily flow).
- HRSD plan approval is required prior to issuing an HRSD Long Form Flow Acceptance Letter and for any direct connection to HRSD.
- Flow Acceptance Letters are good for a period of five years from the date of issuance provided that the site plan approval for the project is current.
- If the project has not been constructed and a certificate to operate has not been issued within that time, the flow acceptance will be null and void.
- In areas where there are capacity challenges, conditional flow acceptances will be issued. These acceptances are generally based on future flow conditions and planned capital improvement projects that will resolve the capacity challenge.

HRSD reviews requests for accepting additional flow through the process established by the region called the Flow Acceptance Process. HRSD analyzes its system using 2.4 times water consumption and running the FORCEMAIN hydraulic model. If the resultant modeled system pressures with the requested additional flow are within the existing pressure policies and there are no capacity related overflows (excluding major storm events) within the past 5 years in the HRSD system in the vicinity of the point of entry of the additional flow, then HRSD has adequate capacity to accept the requested flow. If the pressure policy is exceeded in the model with the additional flow or there is an HRSD capacity related overflow near the proposed additional flow, then a conditional flow acceptance may be granted. Conditional flow acceptance requires that a capital project is scheduled in the HRSD CIP that will resolve the modeled exceedance of pressure policy.

This process has been in place since summer of 2008. The process allows for the orderly and consistent review of new service requests and coordinates the review process between the Localities, DEQ and HRSD.

3.5.4 Training

On-the-job training is provided to the engineers who perform work related to flow acceptance.

3.5.5 Information Management

Flow applications are evaluated utilizing the FORCE MAIN model. FORCE MAIN is a computer model that evaluates available capacity with the HRSD system. After development of the new Regional Hydraulic Model using MIKE URBAN, the Interceptor Engineers will utilize the new model platform to analyze the system prior to issuing Flow Acceptance Letters.

Flow applications are responded to via electronic letters that are emailed to locality applicants. These letters are electronically filed.

3.5.6 Resource Management

There are a total of six Interceptor Engineers assigned to the Flow Acceptance Process as partial duty. The Director of Operations is the supervisor for this Program.

3.5.7 Process for Continuous Improvement

HRSD will continue to review and revise the flow acceptance process on an as-needed, ongoing basis. In addition they plan to improve the flow acceptance process through the following actions:

- Development and documentation of formal business rules for the following:
  - Interceptor Capacity Evaluation; and
  - Conditional Flow Acceptance.
- Further develop and document the Long-Term Flow Acceptance Program.
- HRSD is currently in the process of upgrading the collections system model from a static model; FORCE MAIN, to a dynamic model; MIKE URBAN regional hydraulic model.
- Development of a database for tracking and storage of flow acceptance requests and letters.
- Implementation of cost recovery for engineering services with respect to flow acceptance.

3.5.8 Implementation Plan

Program Milestone	Description	Time Frame
Long-Term Flow Acceptance Program	Development as part of Regional Wet Weather Management Plan	November 26, 2013

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3.6 New Connections

3.6.1 Program Definition and Purpose

The purpose of the New Connections Program is to:

- Prepare accurate and detailed records of new facilities.
- Ensure the contractors who are performing hot taps/wet taps are qualified and approved by HRSD.
- Provide information to Billing Department on new connections.

3.6.2 Goals and Performance Measures

Goals of the New Connections Program are:

- To be aware of new connections.
- Inspect all new connection to make sure they meet HRSD standards.

Goals		Performance Measures	Target Value
New Connections - Inspection	Inspect all new development connections to make sure they meet HRSD standards.	(No. of approved new direct connections inspected per year / No. of new connections made to system per year) X 100%	100%

3.6.3 Program Description / Components

The New Connections Program encompasses projects that connect to an existing HRSD valve, projects that require a new tapped connection, or projects with proposed gravity connections. For all three connection types, HRSD maintains control over the new connection process with advance notification to the Interceptor Engineer required for approval of the connection plans. Compliance with the Miss Utility procedures is also required. An HRSD-designated inspector is to be present at the connection site and all materials used must be new and meet HRSD standards. Use of the new connection requires HRSD authorization. HRSD will re-inspect all new connections six months after completion and the contractor will be required to correct any deficiencies found.

Additionally, connecting to an existing force main valve requires pressure testing the connection prior to use. Tapping a new connection into a force main requires advance approval of the saddle and tapping valves to be used, and only contractors on HRSD's approved tapping contractors list may perform line tapping. In-place pressure testing of the saddle and tapping valve according to manufacturer's procedures is required and only HRSD personnel may operate HRSD valves.

Connections to HRSD gravity mains must be made at manholes, and these connections must meet HRSD standards.

These procedures allow HRSD to control the connection process, to preserve the system integrity, to and practice due diligence while still supporting appropriate service expansion.

3.6.4 Training

On-the job training is provided for staff that performs this work.

3.6.5 Information Management

As part of the phased implementation of HRSD's CMMS system, new connections will eventually be tracked electronically. Currently, North Shore Operation utilizes the CMMS to coordinate and track new connections. They also utilize the geographic positioning system (GPS) and digital photographs to locate connections and provide information for inclusion into HRSD's geographic information system (GIS). South Shore Operations, however, still develops a standard connection report to coordinate and track new connections. These reports are stored electronically. The valve guide which is included in the connection report is utilized to insert the location into HRSD's GIS.

3.6.6 Resource Management

HRSD has six Interceptor Engineer positions that coordinate the installation of all taps with the Localities, consultants and contractors as part of their overall job responsibilities. There are four Engineering Assistant positions that as part of their overall job responsibilities view the installations and obtain information necessary to make the detailed valve guide drawings that show the location and types of valves being connected to HRSD's system. There are additional Operations field support staff members that can be pulled in to help as necessary. See the North and South Shore Interceptors Organizational Charts located in Appendix A, pages A-8 and 9 for more information. Overall management of this program is provided by the North and South Shore Chief of Interceptor Operations.

3.6.7 Process for Continuous Improvement

HRSD will continue to review and revise the new connection process on an as-needed, ongoing basis. In addition, improvements to the new connection process are planned through the following actions:

- Develop connection standards for developers to use as guides for tap-ins;
- Revamp new connection details;
- Develop training program for developers;
- Develop business process for 1-year warranty re-inspection program; and
- Implement cost recovery for time spent on inspections and administrative functions.

3.6.8 Implementation Plan

None identified.

3.7 Financing and Cost Analysis

3.7.1 Program Definition and Purpose

The purpose of HRSD's Finance Department is to maintain a financially viable organization that can protect and manage its assets. HRSD was among the first utilities to receive the National Association of Clean Water (NACWA) Excellence in Management Award. HRSD is widely recognized as a responsible steward of environmental and financial resources.

3.7.2 Goals and Financial Policies

The goals of the Finance and Cost Analysis Program are to:

- Maintain a financially viable organization that can protect and manage its assets.
- Maintain financial flexibility to continually adapt to regional economic and regulatory changes.
- To preserve and enhance HRSD's sound financial condition.

HRSD's Commission has recently adopted financial policies intended to provide for financial stability and sustainability. These policies are being implemented over time and a summary of these policies are as follows:

- General Reserve;
- Risk Reserve;
- Repair and Replacement Reserve;
- Revenue Stabilization;
- Cash Funded Portion of the CIP; and
- Debt Coverage.

3.7.3 Program Description / Components

3.7.3.1 Operations and Maintenance Cost Analysis Programs

HRSD sets the budgets for the cost of operating and maintaining the interceptor system through its annual operating budget. HRSD's user fees fund both the operations and maintenance programs. HRSD charges all customers based on water usage. Industrial and commercial customers are charged a surcharge based on the strength of their waste.

3.7.3.2 Budget and Customer Rate Setting Analysis

Annually, HRSD establishes a budget that is approved by the HRSD Commission. As part of the budget development process, rates are analyzed to determine if they require adjustment. A forecast model that factors in treatment and interceptor services helps guide HRSD in setting rates.

HRSD is funded solely by user fees paid by households and businesses that are provided wastewater collection and treatment services. HRSD receives no state appropriations. HRSD's Department of Finance determines the rates, which are approved by the Commission, by using a forecast model that evaluates the cost of operating the wastewater transport and treatment facilities plus all HRSD overhead cost. The average annual fee per residential household is less than 25 dollars per month (FY2010). The user fees and the rate schedule are evaluated on an annual basis. HRSD contracts with a consultant to review the current rates and ensure that they are accurately allocated based on actual operating costs. Because HRSD is strictly a wastewater utility, none of the fees are used for other purposes.

HRSD is required to adopt its operating budget no later than June 30 each fiscal year. The Director of Finance prepares a budget calendar no later than January 31 each year.

Revenue estimates are based on objective and analytical trend data. Rates and fees are established by the Commission and must be set at levels intended to cover related costs. In setting its user rates, HRSD considers the affordability of rates in the context of regional wealth and income indicators.

For the most part, HRSD's revenues are relatively inelastic to economic conditions as there is limited reliance on economically sensitive revenues (e.g., facility charges). Revenues received are solely based on the user fees paid by households and businesses.

The operating budget is adopted by each individual department and is set at a level necessary for safe and efficient operation of the wastewater treatment and collection system. Budgetary controls are exercised administratively at the department level. The General Manager is authorized to transfer funds between departments without further approval by the Commission. Appropriations lapse at the end of the fiscal year.

HRSD's operating budget is structurally balanced, whereby one-time revenues are used to pay for one-time expenses or placed into operating reserves. As part of the operating budget, HRSD prepares a 20-year financial forecast detailing projected operating and capital expenses and user rate impacts.

3.7.3.3 Capital Improvement Program Funding

The Capital Improvement Plan (CIP) is a long-range planning tool used to summarize needed projects including a description, cost estimate and schedule for each project. The Commission approves the ten year plan along with the planned expenditures for the first fiscal year in the plan. Projects in the approved CIP are brought before the Commission for specific funding authorization as needed.

HRSD prepares a CIP on an annual basis. This CIP outlines ten years of anticipated projects and their costs. Funding for HRSD's CIP comes from revenue bonds, grants and cash contributions from operations.

3.7.3.4 Debt Management Philosophy

Although HRSD is a political subdivision of the Commonwealth of Virginia (the Commonwealth) and a component unit for financial reporting purposes, it is legally and fiscally independent of the Commonwealth and other political subdivisions. HRSD has the authority to issue revenue bonds, notes or other obligations payable solely from the wastewater revenues it generates. Neither the faith nor the credit of the Commonwealth or any other political subdivision is obligated for HRSD's debt.

HRSD maintains a formal debt policy adopted by the Commission. Under that policy, HRSD commits among other things to abide by all of its legal covenants contained in its Trust Agreement.

As of 2010, HRSD has embarked on an ambitious $1.4 billion, ten-year CIP. Regulatory requirements to reduce nutrient discharges to the Chesapeake Bay, initiatives to ensure compliance with the DEQ Special Order by Consent, major plant upgrades and replacements of interceptor pipelines drive the capital program.

The debt funded programs are governed by HRSD's debt policy and its Trust Agreement. HRSD's debt policy requires senior and subordinate debt service coverage ratios of 1.5 and 1.25 times annual debt service, respectively. These coverage requirements are in excess of HRSD's Trust Agreement which requires senior and subordinate debt coverage ratios of 1.2 and 1.0 times annual debt service, respectively. In addition, HRSD's Trust Agreement requires a debt service reserve fund (DSRF); but funding the DSRF is not required if senior coverage is at least 1.35 times annual debt service and a liquidity ratio of 1.35 is also met. Through 2010, HRSD has not been required to fund its DSRF. HRSD's operating and capital improvement plans are developed with the intent to maintain these high coverage ratios.

HRSD's financial strengths are reflected in its high credit ratings:

Table 3-1. HRSD 2009 Credit Ratings

Rating Service	Rating
Moody's Investors Service	Aa2
Standard & Poor's	AAA
Fitch Ratings	AA+

3.7.4 Training

Staff members are provided on-the-job training as required by their specific job related duties in the Finance Division. Additional training descriptions related to all HRSD employees are discussed in Section 3.2 of this Program.

3.7.5 Information Management

Financial information is managed in several systems including the Customer Care and Billing System and the Financial Information System.

3.7.6 Resource Management

The Finance Department manages the financial aspects of HRSD's business through three divisions: Finance and Accounting, Procurement, and Internal Audit. The Director of Finance oversees the three divisions with one administrative coordinator.

The Accounting Division is responsible for reporting financial results in compliance with accounting principles generally accepted in the United States; performing the treasury function; preparing the operating budget; selling debt; and performing the payroll, accounts payable and risk management functions. Ten full time employees are designated to the Accounting Division.

The Procurement Division sets procurement policy and manages the purchase of equipment, supplies and services in compliance with state statutes. The Procurement Division also administers the sale and disposition of surplus property. Eight employees are designated to the Procurement Division.

The Internal Audit Division is responsible for auditing and reviewing HRSD's internal controls and major operational functions. The auditor determines the annual audit schedule using a "risk based" audit approach and makes recommendations for improvement to management. One full time employee is designated as Internal Audit Manager and constitutes the entire department.

A breakdown of the finance department is illustrated in the HRSD Finance Organization Chart shown in Appendix A, page A-4.

3.7.7 Process for Continuous Improvement

A Replacement Planning Model is under development that will aid investment plans based on estimated service life of pipes and pump station assets. The Model provides a forecast of refurbishment and replacement (R&R) needs for a 30 year period that is useful in financial planning. The Model forecast, combined with the results of the condition assessment program should provide the information necessary for an effective long term R&R program.

3.7.8 Implementation Plan

Program Milestone	Description	Time Frame
Replacement Planning Model	Finalize development of a replacement planning model for the Conveyance System	December 2010

3.8 Customer Information

3.8.1 Program Definition and Purpose

Every HRSD department is committed to providing the highest levels of customer service. The Customer Information Service Division provides accurate billing services and responds to customer inquiries. Additionally, HRSD has comprehensive public information, community outreach, and environmental education programs to provide information to customers and the public at-large.

3.8.2 Goals and Performance Measures

The goals of this program are to:

- Provide accurate billing services.
- Provide prompt and courteous responses to telephone or e-mail inquiries regarding billing issues or other concerns.
- Inform the public appropriately of major HRSD construction projects, emergency repairs, and major maintenance activities.
- Provide wastewater treatment related environmental education to the public.
- Inform customers about environmental issues related to wastewater treatment.
- Provide special briefings to local, state and federal elected officials and their staff; other government officials; and utility staff as appropriate.
- Organize formal meetings and open houses to brief the public on certain major projects.

Goals		Performance Measures	Target Value
Customer Information - Billing	Provide accurate billing for services provided by HRSD	(No. of adjustments per year made to customer bills due to errors / No. of customer bills per year) X 100 %	Less than 1%
Customer Information - Response	Provide prompt and courteous responses to telephone or e-mail customer inquiries	(No. of responses to customer calls or emails completed within five business days / No. of customer call or email responses per year) X 100%	95%
Customer Information - Communications	Make the public aware of HRSD activities including construction projects, major maintenance activities, and emergency repairs	Provide information to the public using the most appropriate outreach strategy, which may include posting announcements on the HRSD Web site, issuing a news release or placing an advertisement.	12 per year
Customer Information – Environmental Education	Encourage public stewardship of the environment and explain HRSD's role in protecting the environment	Sponsor or participate in events that promote environmental awareness.	75 per year

3.8.3 Program Description / Components

3.8.3.1 Customer Information Services Division

HRSD's Customer Information Services Division staffs a call center Monday through Friday, 8:00 a.m. to 4:30 p.m. Employees trained in customer service provide prompt and courteous responses to telephone inquiries regarding billing issues or other concerns. This division also provides billing services, accepts payment, and investigates customer accounts when payment has not been received as billed. The Division works with various Localities in regards to billing issues.

The Customer Information Services Division is responsible for responding to ratepayers' questions, sending bills and posting payments. The Division is responsible for the billing and collection of wastewater treatment charges related to approximately 468,000 customer accounts. HRSD's CIS Customer accounts are established and maintained based on the water and sewer connection information provided by the seventeen cities, towns, and counties within HRSD's 3,100 square mile service area. The periodic billing of wastewater treatment charges is based on the metered water consumption information provided by the nineteen public and private water purveyors serving the citizens of these cities, towns, and counties.

HRSD offers municipalities a Billing Service which provides bill printing and payment processing at no cost to participating municipalities. Instead of receiving multiple bills, customers receive one bill. This service is called Hampton Roads Utility Billing (HRUBS). A variety of methods are used for billing based on the procedures specified by each of the participating Localities.

During evenings, weekends and holidays, an answering service takes calls and contacts HRSD as needed to ensure that a responsible party is always available to handle reports of emergencies that might affect public health or the environment. A 24-hour Interactive Voice Response System is available, and a toll-free number, 1-888-ASK-HRUBS (1-888-275-4782), enables customers throughout the region to call at no cost.

3.8.3.2 Public Information Programs - Communications

HRSD uses a variety of outreach strategies to ensure the public is properly informed of major construction projects, emergency repairs, and major maintenance activities. To notify residents of planned activities such as routine maintenance and smoke testing, HRSD uses door hangers in the areas that will be affected. A special hanger is distributed when a spill occurs to provide information about cleanup activities and safety issues. Flyers and notices are distributed to residents of neighborhoods affected by a major construction project.

HRSD employees are available to speak to civic organizations, schools, and other groups on a variety of topics.

HRSD's Chief of Communications, the primary media contact, issues news releases to alert print and broadcast media of planned HRSD projects. The chief also coordinates responses to media inquiries on routine and emergency matters. Senior managers periodically conduct briefings for reporters and meet with newspaper editorial boards.

To ensure the broadest possible notification, for major projects HRSD may place advertisements in newspapers, especially if a public meeting is planned or a significant impact on traffic is anticipated.

Special briefings are provided to local, state, and federal elected officials and their staff; other government officials; and utility staff as appropriate. HRSD staff may visit homeowners to explain projects that could result in an inconvenience.

HRSD's contractors may be required to erect signs at the site of major projects to provide information such as the project Web page and an HRSD phone number to call for more information.

HRSD's Web site, www.hrsd.com, is an important public information tool. In addition to providing information about the organization, customer services, and business opportunities for vendors, the site includes information on major projects.

HRSD has prepared a Communications and Public Response Plan, which provides guidance for public communications during emergencies.

HRSD has prepared a Public Participation Plan in conjunction with the regional Wet Weather Management Plan. This plan has the following elements:

- Website information;
- Annual informational meetings;
- Locality Advisory Committee; and
- Public information about SSOs.

3.8.3.3 Environmental Education Programs - Communications

HRSD's commitment to environmental education is demonstrated through a variety of special programs and initiatives, including:

HRSD, the Virginia Department of Health (VDH), the Sport Fish Restoration Program and the City of Virginia Beach encourage recreational boaters to "Pump Out, Don't Dump Out" through a summer education program. The goal of the program is to promote the proper disposal of wastewater from sanitary holding tanks on boats to prevent dumping of sewage into the waterways. Specially trained college students visit marinas, local festivals, and even homes to educate boaters and demonstrate proper tank pump out procedures.

The Clean Water Curriculum is a teacher-friendly wastewater unit for fourth graders. HRSD developed easy-to-use lesson plans to help students meet the Standards of Learning for Virginia Public Schools. This resource provides hands-on wastewater related activities that make learning fun. Teachers may use every lesson or select their favorites. These science classes feature assignments such as designing a simple treatment system using pipes, screens and buckets. Small groups have the opportunity to develop critical thinking skills as they solve problems in the "Down-The-Drain Dilemmas" lesson. Even the homework is appealing to children. "Be A Leak Detective" provides the procedures for students to follow to determine whether they have leaking toilets and faucets.

HRSD routinely provides educational exhibits for events such as area Earth Day festivals and other events that promote environmental protection.

Environmental Improvement Fund Grants, which are awarded for pollution prevention activities and environmental education, are funded by civil charges paid by businesses and industries that fail to meet their permit requirements. Grant recipients have included: two Newport News elementary schools for oyster restoration projects; the Elizabeth River Project for its River Information Center and educational materials; the Mattaponi Heritage Foundation for American shad restoration and water quality monitoring; the Portsmouth Public Library Foundation, Inc. for books to support the school system's environmental science curriculum; and the Virginia Institute of Marine Science for their submerged aquatic vegetation program. To encourage middle school and high school students' interest in science and the environment, HRSD also annually recognizes selected Tidewater Science Fair projects that demonstrate potential to improve water quality.

The HRSD environmental scholarship, which is administered by the Hampton Roads Community Foundation, was endowed by a grant from the Environmental Improvement Fund. The scholarship recipients must reside in HRSD's service area, be full-time graduate students in a public university in the Commonwealth of Virginia, and be enrolled in one of the following disciplines: environmental health, environmental chemistry, biology, or civil or environmental engineering.

HRSD organizes formal meetings and open houses to brief the public on certain major projects. These meetings are publicized extensively through newspaper advertisements, notices to public officials, letters to civic associations, and flyers distributed to the affected community.

3.8.4 Training

Each new Customer Information Services Division employee is provided a two-week orientation session to generally familiarize them with all of the functions performed in Customer Information Services. An experienced employee works with the new employee for the first 2 to 3 weeks of their actual job duties.

Media response training is provided for all HRSD managers.

3.8.5 Information Management

HRSD archives news releases on the web site http://www.hrsd.com.

3.8.6 Resource Management

The Customer Information Services Division has 63 full-time employees reporting to the Chief of Customer Information Services, who reports to the Director of Information Services.

The public information function is performed by the Chief of Communications who reports to the General Manager.

3.8.7 Process for Continuous Improvement

Improvement suggestions from The Customer Information Services Division employees are obtained through the HRSD-wide continuous improvement efforts.

The Customer Information Services Division Chief is exploring the creation of metrics to measure important customer response performance such as the number of telephone inquiries answered within 24 hours and the number of e-mail inquiries answered with two days.

The Chief of Communications provides an annual summary of HRSD highlights and accomplishments.

The public outreach program is a continuous effort to give the public knowledge of HRSD activities and to encourage the public to contact HRSD with questions or suggestions.

3.8.8 Implementation Plan

None identified.

3.9 Equipment and Tools Management

3.9.1 Program Definition and Purpose

HRSD maintains a wide variety of equipment and tools necessary to support the operations and maintenance of the sanitary sewer system. The equipment and tools are managed by personnel in the Operations Department, which includes Interceptor Operations and Facility Support. The Facility Support Division performs electrical, instrumentation, vehicle, generator, carpentry, and machine shop maintenance for all HRSD locations.

3.9.2 Goals and Performance Measures

Goals		Performance Measures	Target Value
Fleet Preventive Maintenance	Reliable maintenance vehicles, mobile construction equipment, and other mobile equipment are vital to both normal maintenance efficiency and providing a timely response to system problems.	Each significant piece of equipment has an annual PM routine performed. (# of PM's accomplished / # of annual PM's required) x 100%	90%

3.9.3 Program Description/Components

3.9.3.1 Equipment and Tool Repair and Spare Parts Inventory Management Programs

HRSD does not maintain a centralized warehouse for parts and equipment. HRSD keeps critical spare parts at various operations centers for system and pump station repairs. In addition, many frequently needed parts are kept on maintenance vehicles to eliminate travel time needed to pick up parts. A list of businesses where materials can be purchased with a short lead-time is maintained and available with the operations coordinator. The Computerized Maintenance Management System is used to keep track of parts inventory, including spare parts and other types of equipment required to be kept in HRSD's inventory.

HRSD maintains an adequate inventory of critical replacement parts for the interceptor system in warehouses located at North and South Shore Operations Centers. Critical replacement parts kept in inventory include:

- Pipe – at least 3 pipe joints of frequently encountered diameters for AC, CMP, PCCP, DIP, VC, HDPE, PVC, RCP
- Transition Fittings (DI to PCCP/RCP) – frequently encountered diameters from 18" to 48"
- Full Circle Clamps – frequently encountered diameters from 12" to 54"
- Couplings/Sleeves – frequently encountered diameters from 12" to 54"
- Tapping Sleeves – frequently encountered diameters from 18" to 54"
- Plugs/Caps – various sizes
- Inflatable Plugs – various sizes

Pump station parts are not considered critical because by-pass options are available for immediate set-up if a problem occurs. HRSD pump stations are designed with inherent redundancy to Class 1 reliability standards.

Updated in Appendix C, HRSD maintains an inventory of portable pumps in the event of delay in repair to a permanent pump. Appendix C provides a snapshot of the current portable pump deployment. This deployment is dynamic and will change as needs dictate. HRSD also maintains a rental agreement with emergency authorization with Godwin Pumps to provide pumps within a 2 hour notice. Furthermore, HRSD maintains a Machine Shop that can fabricate parts if necessary.

HRSD contracts with local vendors to provide everyday supplies. A charge card system is used that allows employees in all HRSD departments to charge supplies against their budget. In lieu of maintaining a large warehouse, HRSD utilizes storage at vendors and have the availability of daily deliveries of crucial supplies when needed.

Each maintenance group maintains critical replacement parts in their local shops and maintenance vehicles to reduce travel time to remote locations.

3.9.3.1.1 Vehicle Repair Management Program – Automotive Shop

HRSD maintains automotive shops at the North Shore and South Shore locations. Nearly all of the rolling stock is maintained by the automotive technicians. This includes emergency generators at pump station sites. The Automotive Shop maintains the automotive fleet of cars, trucks, heavy trucks, trailers, boats and heavy equipment. The size of the fleet varies somewhat from year to year according to the needs. Automotive technicians maintain a unique schedule based on mileage and duty to ensure the safety of the equipment and personnel. The automotive technicians maintain records of maintenance and repair activities performed on the equipment. The Automotive Shop also maintains and/or provides service for the stationary and most of the mobile diesel generators in HRSD.

Automotive technicians perform the annual preventive maintenance on the permanently mounted pump station emergency generators as well as the mobile generators larger than 100kW. The routine maintenance on the permanently mounted emergency generators is performed by the Interceptor Division personnel. The interceptor work and test frequencies are identified on Figure 3-1. The Automotive work is identified on Figure 3-2. The automotive and electrical work is identified and documented in the CMMS.

Five portable generators are stored at the South Shore Maintenance Shop located at 1436 Air Rail Avenue, Virginia Beach, VA 23455, and two portable generators are stored at the North Shore Maintenance Shop located at 2301 G Avenue, Newport News, VA 23602.

Interceptor Systems Preventive Maintenance

Inspection Schedule

Item	Daily*	Weekly	Monthly	Quarterly	Semi-annually	Annually
Batteries - check water or electrolyte	I					
Belts & hoses - inspection	I				A	
Cooling system leaks - check	I					
Coolant level - check		I			A	
Clean unit & touch up paint						I
Check day tank & battery charger	I					
Check automatic leak detection - underground tanks	I					
Engine lube oil - check	I				A	
Fuel - above ground & belly tanks			I			
Fuel gage - underground tanks					I	
Generator 4-hour test & fuel inventory			I			
Inspect engine preheat indicator	I				A	
Inspect unit for leaks, drips & other defects	I				A	
Test leak detection monitor (button)	I					
Inspect & test leak detection system (sensor) underground tanks				I		
Visual inspection of above ground tanks	I			I		

* During each station check by Service Technician.

I = Interceptors
A= Automotive Division

Figure 3-1. Emergency Generator Inspection Schedule

PREVENTIVE MAINTENANCE CHECK SHEET - EMERGENCY GENERATORS

Technician:	Pump Station:	Date:
Time Started:	Time Shut-Down:	Total Run Time:

ITEM:	Repairs Needed YES	NO
Crankcase Oil Level		
Oil Leaks		
Coolant Leaks		
Coolant Level		
Condition of Hoses		
Condition of Belts		
Block Heater		
Day Tank Operation		
Fuel Transfer Pump (s)		
Radiator Cleanliness		
Radiator Louvers Operational		
Test Coolant for Proper pH		
Battery Condition		
Battery Charger Condition		
Engine Vibration Isolator Cond.		
Generator Bearing Lubrication		
Generator Inspection		
Air Filter & Induction Sys. Cond.		
Transfer Switch Operation		
Station Alarms Operation		
Gauges Functioning		
Unusual Noises		

NOTE and RECORD:	
Engine Hours - Start	
Engine Hours - Stop	
Engine Oil Pressure	
Coolant Temp.	
RPM	
Frequency	
Voltage Phase 1	
Voltage Phase 2	
Voltage Phase 3	
Exhaust Opacity	
Crank Time to Start	
Battery #1 / Volts	
Battery #1 / CCA	
Battery #2 / Volts	
Battery #2 / CCA	

PARTS USED - DESCRIPTION / PART #

DESCRIBE ALL ACTIONS TAKEN:

Figure 3-2. Automotive Division Inspection Checklist for Emergency Generators

3.9.3.2 Electrical Maintenance

Electrical calibration, preventive maintenance and corrective maintenance are provided by electrical staff working in the Facility Support Division. The electrical staff is positioned at both the North Shore and South Shore locations.

3.9.3.3 Machine Shop

The Machine Shop provides the ability to overhaul pumps as well as fabricate parts when needed to repair pumps and valves.

3.9.3.4 Instrumentation Maintenance

Instrumentation calibration, preventive maintenance and corrective maintenance are provided by Instrumentation Specialists working in the Facility Support Division. They are stationed at the North Shore and South Shore locations.

3.9.3.5 Carpenter Shop

The Carpenter Shop provides minor structural repairs as well as repairs to door, locks, roofs, etc. They are stationed on the North and South Shores.

3.9.3.6 Physical Plant Maintenance (PPM)

The PPM staff perform small repair contracts to support the entire division including generator replacement contracts.

3.9.4 Training

HRSD employees that are responsible for operations and maintenance complete HRSD's Apprenticeship Program or equivalent program. The Apprenticeship Program is a combination of on-the-job training and related classroom training. MOM Section 3.2 provides further detail on this program. Vendor and equipment training is provided on an as-needed basis.

3.9.5 Information Management

The Computerized Maintenance Management System (CMMS) is used to keep track of parts inventory, including spare parts and other types of equipment required to be kept in HRSD's inventory. The CMMS is used to record much of the maintenance activity, and the automotive technicians maintain records of maintenance and repair activities performed on the vehicles. Increased use of the CMMS is an improvement initiative.

3.9.6 Resource Management

Facilities Support Division is lead by the Chief of Facility Support, who reports to the Director of Operations. The Automotive maintenance is led by the Automotive Superintendent and encompasses nine full time employees. Electrical maintenance is led by the Electrical Manager and encompasses thirty-two full time employees. Instrumentation maintenance is led by the Instrumentation Manager and encompasses thirty-six full time employees. The Physical Plant Maintenance is led by Physical Plant Maintenance Manager and encompasses seventeen full time employees. For more detailed information on organizational structure, refer to Operations – Facility Support organizational chart in Appendix A, page A-7.

Vehicle and equipment inventory changes regularly as equipment is added, retired or replaced. As of March 2010, the Facility Support Division has the following vehicles and equipment:

Table 3-2. Inventory of Vehicles & Equipment in Facility Support Division

Division	Equipment
Automotive Shop – North Shore	2 light duty trucks
Carpenter Shop	2 heavy duty trucks & vans
Electrical – North Shore	1 light duty trucks 9 heavy duty trucks & vans 1 trailers 1 forklifts
Instrumentation – North Shore	2 light duty trucks 8 heavy duty trucks & vans
Automotive Shop – South Shore	2 light duty trucks
Electrical – South Shore	1 light duty trucks 8 heavy duty trucks & vans 2 trailers 1 forklifts
Instrumentation – South Shore	4 heavy duty vans and 1 light duty truck
Instrumentation – SCADA	8 heavy duty vans and trucks
Machine Shop	1 heavy duty trucks & vans 1 forklifts
Physical Plant Maintenance	3 light duty trucks 1 heavy duty trucks & vans 1 SUV

3.9.7 Process for Continuous Improvement

The Facility Support Division annually reviews its operations and procedures at the crew level, and improvement ideas are collected for evaluation and implementation.

HRSD's *Interceptor Systems Preventive Maintenance Manual* was updated in December 2010. This update reflects revised PM checklists, forms, and schedules. Subsequent reviews will reflect additions or deletions of equipment and revised PM procedures. The manual will be reviewed annually to determine if additional revisions will be needed.

HRSD is continuing to implement the CMMS to allow more widespread usage. Equipment records will contain design information, maintenance history, current physical condition, criticality, and schedule of inspection and maintenance activities. The updated Preventive Maintenance procedures and schedules from the updated *ISPMM* will be incorporated into the CMMS. The reporting information obtained from the CMMS will allow evaluation of the effectiveness individual PM procedures on individual equipment and moreover of the entire MOM Program.

3.9.8 Implementation Plan

Program Milestone	Description	Time Frame
Issue Updated Version of PM Manual	Revise manual to show latest procedures and schedules.	December 2010
Review and, if necessary, Revise PM Manual	The PM Manual should be a living document that reflects changes in equipment and knowledge.	Every 3 years
Complete CMMS Implementation	Fully utilize CMMS to contain equipment information, manage PM procedures, and allow comprehensive reporting.	Summer 2011

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3.10 Legal Support Programs

3.10.1 Program Definition and Purpose

The purpose of the Legal Support Program is to provide appropriate legal authority to support the management, operations and maintenance of HRSD system. HRSD, through its enabling legislation, has the legal authority to maintain agreements with Localities, minimize potential reportable SSOs, and implement the various facets of the MOM Program. Specifically, the enabling act (§45 of Chapter 66 of the Act of Assembly of 1960 as amended by Chapter 520 of the Acts of Assembly of 1964) authorizes and empowers HRSD to:

- Adopt bylaws and to make rules and regulations;
- Adopt an official seal;
- Sue and be sued;
- Construct, improve, extend, reconstruct, maintain, equip, repair and operate sewage disposal systems;
- Issue revenue bonds, notes or other obligations of the District for any authorized purpose;
- Acquire lands, structures, property, rights of way, easements, franchises or other interests;
- Employ engineers, attorneys, accountants, construction experts, financial experts, managers and other officers, employees and agents;
- Exercise jurisdiction, control and supervision over any sewage disposal system operated or maintained by the District and to make and enforce such rules and regulations for the maintenance and operation of such system;
- Enter upon any land, water or premises to make surveys, borings, soundings or examinations;
- Construct and operate trunk, intercepting or outlet sewers, sewer mains, laterals, conduits or pipelines;
- Restrain, enjoin or otherwise prevent any county, city town or political subdivision and any person, or corporation from discharging into any waters within the District, any sewage, industrial waste or other refuse which would contribute or tend to contribute to pollution;
- Use and connect with any sewage disposal system and, if deemed necessary, to close off or seal any outlets or outfalls there from;
- Enter into contracts with the United States of America or with any county, city , town or political subdivision or any sanitary district, private corporation, association or individual providing for or relating to the treatment and disposal of sewage;
- Receive and accept grants or aid for the planning, construction or financing of any sewage disposal system;
- Make and enter into all contracts and agreements necessary or incidental to the performance of its duties; and
- Seek civil penalties against owners who have been charged with violation of or found to be in violation of the pretreatment standards.

3.10.2 Goals and Performance Measures

The goals of HRSD's Legal Support Programs are to:

- Provide legal authority to support operations and minimize SSOs;
- Provide legal authority to manage connections to system;

- Provide legal authority for pretreatment of industrial discharges, regulation of waste haulers, etc.; and
- Provide legal authority to control peak flows in the system.

3.10.3 Program Description/Components

3.10.3.1 Inter-Jurisdictional Agreement Program

HRSD was established by the Virginia General Assembly through enabling legislation. All Localities must petition the circuit court to become a member of HRSD. There are no formal contracts between HRSD and the Localities. Once a Locality becomes a member of HRSD, they must follow HRSD policies in order to connect to the HRSD system.

3.10.3.2 Interest Participation Agreement (IPA), Lease Purchase Agreement (LPA) and Relocations

HRSD works closely with all Localities to plan for new facilities or relocation of existing facilities. If a new development requires HRSD to provide sewage facilities, HRSD will do so under an IPA or LPA. HRSD does not build facilities on speculation that something will occur in the future. An IPA is signed by the Locality, and they agree to pay interest on the construction cost to build the line. HRSD will pay the capital cost to build the new facility provided it is in the future Facilities Plan. As new connections tie into this new pipeline, 70 percent of the wastewater treatment user fees are credited toward the interest cost. Once enough development is established whereby the 70 percent credit offsets the interest payments, no further commitment from the Locality is required and the lines are then considered to be paying for themselves.

A Lease Purchase Agreement is similar to the IPA but the Locality actually builds the line and owns it. HRSD agrees to operate and maintain the line and actually pays a lease payment to the Locality based on 70 percent of the wastewater user fees obtained for connections to the new segment of line. When it becomes economically advantageous, HRSD will purchase the line for the price the Locality paid to have it designed and built.

At times, HRSD is required to relocate specific facilities. If an HRSD facility is located in a city right-of-way that was not under an agreement in some other form, HRSD may be required to relocate the pipeline at cost to HRSD if a Locality undertakes an improvement project. If HRSD has a facility in an easement, the Locality is required to re-locate HRSD's line if necessary. At that point, typically HRSD will contract to have the line moved but will require an agreement from the Locality. The agreement must assure the line is being moved in accordance with HRSD's requirements and that the Locality will reimburse HRSD for the costs of relocating the facility if it is in an easement or in property owned fee simple by HRSD.

3.10.3.3 Service Laterals Legal Support Program

HRSD does not own or does not maintain service laterals except for limited areas in the Middle Peninsula. Everywhere else, the laterals within the public right of way are controlled by the Locality in which they are located. Private property owners own and maintain the laterals on private property.

3.10.3.4 Pretreatment Legal Support Program - P3

The HRSD Pretreatment & Pollution Prevention Division (P3) is responsible for regulating industrial and commercial discharges through application of the HRSD Industrial Wastewater Discharge Regulations and National Pretreatment standards in 40 CFR 403.5 in US Federal Code of Regulations. These regulations include general and specific effluent limitations and define the discharge permit program. The authority to enforce the Industrial Wastewater Discharge Regulations of HRSD and all applicable State and Federal regulations, including final EPA "pretreatment limitations," is provided in Section 102 of the HRSD Industrial Wastewater Discharge Regulations.

3.10.3.5 Septic Tank Haulers Legal Support Program – P3

Septic tank haulers are regulated by HRSD in accordance with Section 305 of the HRSD Industrial Wastewater Discharge Regulations, Discharge of Hauled Wastes. The Virginia Department of Health (VDH) typically does not issue a VDH permit to haulers in the region unless the hauler has an HRSD Indirect Permit.

3.10.3.6 Grease Control Legal Support Program – P3

Section 301 D of the HRSD Industrial Wastewater Discharge Regulations prohibits "Any solids or viscous substances that may cause obstruction to flow or be detrimental to sewerage system operations." Section 301 G prohibits "Any petroleum or mineral-based oils (non-saponifiable) and/or any animal or vegetable based oils, fats, or greases, which in excess concentrations would tend to cause interference, pass-through, or adverse effects on the sewerage system, as determined by HRSD."

3.10.3.7 Infiltration and Inflow Control

Section 40 of the Enabling Act prohibits the discharge of anything that may be injurious or deleterious to the sewer system. Further, this section also prohibits the introduction of excessive ground or surface water to the system. HRSD has used this authority to institute enforcement actions against military installations through administrative orders to reduce I/I.

3.10.4 Training

Staff members are provided on-the-job training as required by their specific job related duties. Additional training descriptions related to all HRSD employees are discussed in Section 3.2 of this Program.

3.10.5 Information Management

Enabling Act and other policies are contained within HRSD's internal Intranet and are posted to main webpage, www.hrsd.com, if appropriate.

3.10.6 Resource Management

Division chiefs are responsible for specific programs to provide input and assistance for agreements, ordinances, and policy changes. The time dedicated for specific personnel will depend on the specifics of legal support. HRSD will hire an attorney for additional legal support.

3.10.7 Process for Continuous Improvement

HRSD is working collaboratively with the Localities to develop and implement a Private Property I/I Abatement Program. This program may require some legislative support from the Virginia General Assembly.

3.10.8 Implementation Plan

HRSD will implement the Private Property I/I Abatement program collaboratively with the Localities along with any necessary legislation. It is anticipated that this program will continue development throughout calendar year 2011 and implementation will begin thereafter

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3.11 Fats, Oils, and Grease (FOG)

3.11.1 Program Definition and Purpose

The buildup of Fats, Oils, and Greases (FOG) significantly contribute to sanitary sewer blockages and overflows. These problems primarily occur in the gravity systems owned by the cities and counties within the HRSD service area. The majority of the HRSD system is comprised of force mains which are much less affected by FOG deposits. However, since HRSD has the legal authority to control material introduced into the entire system, HRSD currently plays a key role in reducing FOG-related problems by assisting the Localities in their FOG control efforts.

3.11.2 Goals and Performance Measures

HRSD records all FOG-related calls for assistance from Localities.

All permitted waste haulers must comply with various discharge and reporting requirements specified in their Indirect Wastewater Discharge Permit. HRSD's P3 Division also responds to any report from Operations Department staff of treatment plant problems that may be the result of hauled waste discharged at the facility. If investigation proves a waste hauler to be the cause of the problem, the hauler will be appropriately dealt with in accordance with the HRSD Pretreatment & Pollution Prevention Enforcement Response Plan.

Goals		Performance Measures	Target Value
FOG - Permitted Waste Haulers	To control waste hauled to the HRSD treatment plants that accept hauled waste, HRSD issues Indirect Wastewater Discharge Permits to many waste haulers operating in the region.	Number of loads of FOG (grease) delivered to HRSD treatment plants per year	Monitor trend annually

3.11.3 Program Description/Components

HRSD assists the Localities with their FOG control programs. A Memorandum of Agreement is in place between HRSD and the Localities to control FOG discharge in individual Locality gravity collection systems. HRSD will provide enforcement initiatives to the Localities for older food service establishments which are exempt from complying with the newer requirements.

The Hampton Roads Planning District Commission (HRPDC), in conjunction with all of the Utility Directors in the area, has a FOG program to educate people regarding disposal of fats, oils and grease and highlights proper disposal methods.

HRSD supports the HRPDC effort to institute a regional grease initiative. Since 2004, HRSD's Hampton Roads Fats, Oils and Grease (HR FOG) representative has been involved in the research commissioned by HRPDC to identify the most significant training needs. HR FOG has launched a regional campaign that first targets food service establishments.

3.11.3.1 Permitting Program

HRSD does not issue permits or other similar control mechanisms specifically for grease control devices (GCDs).

However, HRSD issues Indirect Wastewater Discharge Permits to all waste haulers that discharge at HRSD treatment plants. HRSD allows these permitted waste haulers to discharge non-industrial wastes at designated HRSD treatment plants. Permitted wastes include domestic septage, food service GCD waste, collection, holding and transfer (CHT) wastes from vessels, and wastes from portable toilets. Any waste hauler that is permitted by HRSD and collects GCD waste from commercial customers is required to submit a monthly report detailing the customer and quantity collected. These hauled wastes are billed in accordance with the current HRSD Rate Schedule (18) for Hauled Wastewater (Indirect Discharge Waste). All indirect discharge trucks are issued HRSD ID cards and transponders for the automated septic receiving facilities currently located at six of HRSD's major treatment plants.

3.11.3.2 Inspection Program

HRSD inspects GCDs as part of the initial food service establishment investigations and follow-up inspections. The vast majority of facilities with GCDs are commercial food service establishments, which are not permitted by HRSD but are investigated and sampled for surcharge determination. HRSD also provides assistance to any Locality requesting help with FOG-related problems within the service area. If a Locality is experiencing line blockage or pump station problems as a result of a particular discharger(s), and requests HRSD's assistance, HRSD requires the problem discharger(s) to take corrective actions, using the regulatory authority given to HRSD through the Industrial Wastewater Discharge Regulations.

Permitted waste haulers are spot checked on a random, unannounced basis at HRSD treatment plant hauled waste discharge sites. Each discharge site is also constantly monitored using video.

3.11.3.3 Enforcement Program

If a facility has no GCD, or if a GCD is found to be improperly installed, undersized, in need of repair, or improperly maintained, the facility is issued a written problem notification and is required to address the problem. A subsequent site inspection is performed to verify that corrective action has been taken. In the event a problem is not properly addressed as required, additional enforcement actions can be taken, though in the case of commercial food service establishments, additional enforcement actions are generally unnecessary.

All permitted waste haulers must comply with the HRSD Industrial Wastewater Discharge Regulations and all conditions of their Indirect Wastewater Discharge Permit. Any instance of non-compliance is addressed in accordance with the HRSD Pretreatment & Pollution Prevention Enforcement Response Plan.

Permitted waste haulers must submit a monthly report to HRSD recording the type of waste brought to HRSD from commercial facilities and the waste source. This information can be used to confirm an establishment's claim of using a permitted waste hauler to dispose of grease.

By virtue of the Enabling Act, HRSD is authorized to gain access to private property to inspect for FOG compliance and also to enforce compliance of FOG control requirements. HRSD and the Localities are working together to establish a regional FOG control program. Using a working group, a model ordinance, enforcement guidelines and GCD standards have been developed for Locality adoption. Legislation has been adopted at the State level to give Localities the ability to use civil penalties to control FOG disposal into the wastewater collection system.

3.11.4 Training

HRSD uses a "Cease the Grease" campaign which includes radio public service announcements (PSA) and other means to encourage customers not to pour grease down the drain or disposal. The airing of these PSAs is part of a public information program to assist Localities with efforts to eliminate SSOs caused by grease in municipal lines. Other activities include distribution of stickers and coloring sheets at festivals and special events.

The HRPDC, in conjunction with all the utility directors in the area, has a program called HR FOG to educate people regarding disposal of fats, oils and grease and highlights proper disposal methods.

FOG inspections and enforcement activities are conducted by the HRSD's P3 Division, and all training is performed on an on-the-job basis.

3.11.5 Information Management

HRSD documents requests for assistance from the Localities served by HRSD.

Each HRSD site that accepts material from permitted waste haulers maintains an electronic database that records the amount and type of material delivered.

3.11.6 Resource Management

HRSD has three Water Quality Technicians at the North Shore P3 operation and five Water Quality Technicians at the South Shore P3 operation who perform FOG-related work on an as-needed basis. These personnel are respectively under the direction of the North and South Shore P3 Managers. Both of these managers report to the Chief of Pretreatment & Pollution Prevention, who in turn reports to the Director of Water Quality. The organization charts in the Appendix A, page A-21 provide more information on the Water Quality Department.

3.11.7 Process for Continuous Improvement

HRSD supports the HRPDC effort to institute a regional grease initiative. Since 2004, the HR FOG representative has been involved in the research commissioned by HRPDC to identify the most significant training needs. HR FOG has launched a regional campaign that first targets food service establishments.

The P3 Division, which handles FOG-related issues is an active participant in the HRSD continuing improvement program, and employee suggestions are encouraged, accepted, and prioritized by the employees prior to being submitted for action.

3.11.8 Implementation Plan

Implementation of the Locality FOG programs is ongoing and HRSD will continue to assist Localities in that endeavor.

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3.12 Pretreatment & Pollution Prevention Programs

3.12.1 Program Definition and Purpose

The HRSD P3 Division under the Water Quality Department is responsible for investigation and control of industrial and commercial (non-domestic) discharges to sanitary sewer system.

3.12.2 Goals and Performance Measures

One of HRSD's main objectives is to promote pollution prevention among industries, businesses, and government entities. The primary goal of the P3 Program is to ensure treatment plants and collection systems are not adversely impacted by non-domestic discharges. Performance measures for the P3 Program include:

- Collection system issues determined to be caused by commercial/industrial dischargers;
- Number of industrial inspections with deficiencies or violations noted;
- Issuance of pollutant Notice of Violations (NOV); and
- Full Compliance.

Goals		Performance Measures	Target Value
P3 - System Issues determined to be caused by commercial/industrial dischargers	Collection System Issues related to unauthorized materials introduced into the system such as FOG, prohibited chemicals, etc. The annual number of qualifying system issues provides an indication and trend of progress being made to reduce these occurrences.	Number of system issues per year	Monitor trend annually
P3 - Industrial Inspections	HRSD performs periodic inspections of all permitted industrial dischargers to determine compliance with permit requirements and Industrial Wastewater Discharge Regulations	Number of periodic Industrial Inspections performed per year	Monitor trend annually
P3 - Notice of Violation for Pollutants	HRSD has the authority to issue NOVs when non-compliance with local or categorical limitations is discovered. The number of NOVs issued provides an indication and trend of compliance.	Number of NOVs issued per year	Monitor trend annually
P3 - Permitted Compliance	HRSD samples permitted dischargers on a random, unannounced basis with the annual frequency of sampling based on the category of the User. HRSD also requires permittee self-monitoring and reporting.	Number of permitted industries recognized for exemplary compliance. No violations – Gold, Platinum or Diamond Award, no more than 3 violations (SIU) or no more than 1 violation (non-SIU) - Silver Award	Monitor trend annually

3.12.3 Program Description / Components

HRSD's Pretreatment Program plays a critical role in HRSD's MOM Program. Its components and contributions are summarized in this section.

One of HRSD's main objectives is to promote pollution prevention among industries, businesses, and government entities. The HRSD P3 Division under the Water Quality Department is responsible for investigation and control of industrial discharge. The pollution prevention program is funded through civil penalties from industries and businesses that do not comply with permit requirements or HRSD's Industrial Wastewater Discharge Regulations.

3.12.3.1 Industrial User Permitting Program

HRSD's P3 Division is responsible for regulating hundreds of commercial and industrial facilities through enforcement of HRSD's Industrial Wastewater Discharge Regulations. Approximately 250 industrial dischargers (including waste haulers) have been issued discharge permits, which outline applicable effluent limitations, monitoring requirements, metering requirements, and appropriate compliance schedules.

Permit coverage is required by industries at the discretion of the P3 Division. Permit compliance is monitored through unannounced grab sampling, week-long sampling surveys, periodic inspections and self monitoring by the industry. Permit Violations are responded to as outlined in the HRSD P3 Enforcement Response Plan, which is located at the P3 Division office.

Many types of commercial facilities and smaller industrial users, which include some located within federal facilities, are regulated using the same type of permit program and regulatory controls used for significant industrial users. Examples of these facilities include small, medium, and large laundries; large photo processors; vehicle maintenance facilities (public and private including radiator shops, etc.); medium and large medical facilities; food processing facilities; centralized waste treatment facilities; tank truck hauling services; public and private chemical and biological laboratories; and small manufacturing facilities. These small facilities are sometimes ignored by large industrial waste control programs; however, regulation of these facilities has been a key to the success of HRSD's pretreatment program. Although each individual facility represents a small loading to the publicly-owned treatment works (POTW), together they can represent a large portion of the toxics received at the plant.

HRSD's local limits were developed and are reviewed periodically to protect the POTW facilities as well as their receiving water bodies. The most important factor used in the determination of limits were biosolids reuse, no opportunity for inhibition (including nitrification) and discharge of a non-toxic effluent from the plants. This is accomplished using the allowable head works loading method in conjunction with a combination of the uniform concentration limit and the mass proportion allocation methods. HRSD chose these allocation methods because they offer the most flexibility in providing a concentration limit (easy to regulate), yet also provides a more reasonable approach to regulating industries based on pounds of toxic pollutants discharged to the sewer system.

HRSD regulates the following parameters numerically: arsenic, cadmium, total chromium, copper, cyanide, lead, mercury, nickel, phenolic compounds, silver, zinc, pH, non-saponifiable oil and grease, total and individual toxic organics, BTEX (benzene, toluene, ethylbenzene, and xylenes) and COD/BOD ratio. The specific limits for these can be found in the HRSD Industrial Wastewater Discharge Regulations which are located at the Pretreatment & Pollution Prevention office. Concentration limits are based on flow amounts, where concentration limits decrease as flow increases to control the quantity that may enter the POTW.

In addition to the numerical limits referenced above, HRSD has prohibited (zero discharge) discharge of a number of very toxic chemicals and pollutants to the HRSD's system. HRSD maintains and updates a list of these chemicals and pollutants as necessary as a supplement to the Industrial Wastewater Discharge Regulations which are located at the Pretreatment & Pollution Prevention office. The list is provided to all industrial users and they are advised of the appropriate discharge prohibitions. Examples of these include Perchloroethylene (PERC), Tributyltin (TBT) and Polychlorinated Biphenyls (PCBs).

HRSD's pretreatment program is an integral part of a comprehensive toxics monitoring program. To date, this extensive program has detected no significant adverse environmental impacts and thus validates the effectiveness of the current Industrial Waste Control Program.

3.12.3.2 Inspection and Sampling Program

HRSD samples permitted dischargers on a random, unannounced basis. Inspections are performed regularly with frequency ranging from once or twice per year for Significant Industrial Users, and Non-significant Industrial Users and Indirect Permit holders are inspected as necessary. Every permitted industrial discharger is sampled on a monthly to semi-annual basis, depending on their record of compliance. These sampling events consist of self-monitoring performed by the permit holder, as well as HRSD sampling events. HRSD performs unannounced grab sampling, as well as week-long composite sampling. In addition to permitted dischargers, HRSD also inspects and samples hundreds of commercial and service facilities, such as food service establishments and automotive dealerships. These facilities are sampled for surcharge purposes and to ensure compliance with the HRSD Industrial Wastewater Discharge Regulations.

3.12.3.3 Enforcement Program

Compliance with HRSD's Industrial Wastewater Discharge Regulations is ensured through the use of an extensive monitoring program (HRSD monitoring of industrial users in conjunction with industrial self-monitoring).

The HRSD P3 Enforcement Response Plan (ERP) was developed in accordance with Section 501 of HRSD's Industrial Wastewater Discharge Regulations, requirements of HRSD's Virginia Pollution Discharge Elimination System (VPDES) Permit, and in accordance with requirements of the Clean Water Act (40 CFR Part 403.8)(f)(5). The Plan outlines enforcement mechanisms for violations of HRSD's Industrial Wastewater Discharge Regulations. It is based on the Virginia Water Control Board's Compliance Auditing System (CAS) which is used for enforcement of Virginia Water Control law and the VPDES Permit system. The ERP is kept in electronic and paper copy in P3's main office and will eventually be kept on HRSD's main webpage.

The ERP, approved by the DEQ, uses a point system where violations are assessed points in accordance with their severity and frequency as described in the Enforcement Response Plan. Points range from 0.2 to 4.0 points and are totaled for a running 180-day window, and escalating enforcement action is applied based on the point total. Enforcement responses include Notice of Deficiency, Notice of Violation, Compliance Letter, Show Cause Notice, Civil Penalty and Permit Revocation/Termination of Service. HRSD implemented this charge system in January 1993. The program provides a financial incentive to the industry to achieve compliance and resulted in an increase in the number of industrial users attaining 100 percent compliance.

The HRSD Pretreatment & Pollution Prevention Division (P3) is also responsible for regulating industrial and commercial discharges and has implemented the HRSD Industrial Wastewater Discharge Regulations and National Pretreatment standards in 40 CFR 403.5 in US Federal Code of Regulations. These regulations include general and specific effluent limitations and define the discharge permit program. The authority to enforce the Industrial Wastewater Discharge Regulations of HRSD and all applicable State and Federal regulations, including final EPA "pretreatment limitations," is provided in Section 102 of the HRSD Industrial Wastewater Discharge Regulations.

3.12.4 Training

Training for P3 staff includes an internal training program as well as Water Environment Federation (WEF) Pretreatment Training. The internal training program consists of a variety of training modules provided by HRSD staff with appropriate expertise. WEF Pretreatment training is offered to new hires as well as current staff as-needed. In addition, continuous training is available via PowerPoint presentations.

3.12.5 Information Management

Permit related correspondence is stored as hardcopy for a minimum of 3 years, as required by DEQ Permit. In addition, the Pretreatment Information Management System (PIMS) is utilized to manage data associated with the P3 Program.

3.12.6 Resource Management

There are twenty-four positions dedicated to the P3 Program reporting to the Chief of Pretreatment & Pollution Prevention. For more information, refer to the organizational chart located in Appendix A, page A-21. In addition, P3 has a fleet of fourteen vehicles. Of the fourteen, there are seven trucks and vans of various sizes and configurations which are dedicated to sampling and investigation activities, carrying grab and composite sampling equipment, and incident response. The remaining seven vans are used primarily for inspections, but can also be used during incident responses.

3.12.7 Process for Continuous Improvement

HRSD will continue to review and revise the P3 Program on an as-needed, ongoing basis. To facilitate this, P3 holds annual planning days where they take a look at the Program and identify areas for improvement. In addition they plan to improve the pretreatment program through the following actions:

- Increasing self-monitoring requirements for permitted industrial dischargers;
- Continue to work with Localities on FOG and I/I Issues;
- Continuing development on training program to make it more formal;
- Continue to develop measures program; and
- Updates of ERP and Regulations and post to HRSD main website, www.hrsd.com.

3.12.8 Implementation Plan

None identified.

3.13 Water Quality Monitoring Program

3.13.1 Program Definition and Purpose

HRSD has an extensive monitoring program, which analyzes wastewater at various stages of treatment. Not only is fully treated, disinfected effluent analyzed, but samples are also taken of raw influent and at various process units throughout the treatment facility.

3.13.2 Goals and Performance Measures

Maintain 100-percent compliance with VPDES permit.

Goals		Performance Measures	Target Value
WQ - Monitoring	Maintain compliance with VPDES permits to protect the public safety and the environment.	Annual number of permit exceedances per plant	< 6 exceedances per plant per year

3.13.3 Program Description/Components

As mentioned above, wastewater is analyzed at various stages of treatment. Storm water management at HRSD treatment facilities is required under the VPDES regulations. Material storage and handling is carefully monitored at each plant site to prevent discharges to the storm drain. HRSD is also subjected to unannounced inspections by the Virginia Department of Environmental Quality.

HRSD provides water quality monitoring assistance and analytical services to the Localities upon request. These monitoring activities may include bacterial monitoring and optical brighteners' detection, as well as monitoring for other parameters at storm water outfalls.

3.13.3.1 Routine Water Quality Monitoring Program

All large treatment facilities are staffed 24 hours a day, 365 days a year. A Wastewater Characterization program is conducted for screening purposes. Treatment plant operators follow an emergency reporting procedure to report any change in influent pH, odor, color or general appearance. In addition, any process failure such as loss of chlorine residual is reported.

3.13.3.2 Investigative Water Quality Monitoring Program

An important part of industrial waste control at the publicly owned treatment works is the ability to locate, and hold liable, sources of unusual discharges that cause treatment difficulties. HRSD has such capabilities in the form of an "Industrial Waste Alert System."

Members of the HRSD P3 Division respond immediately to locate the source and terminate discharge of any unusual substance into the collection system that may affect the treatment facility. Enforcement mechanisms to assign liability for damages to sources of upsets and to terminate service are provided for in the HRSD Industrial Wastewater Discharge Regulations, Part V, Violations and Enforcement. Enforcement activities under these regulations have resulted in the collection of civil charges from violators. This money is re-invested in award luncheons, scholarship funds or community outreach projects. Additionally, the overall quality of HRSD effluent has been improved as a result of reduced industrial waste discharge.

3.13.3.3 Water Quality Monitoring for Spill Impact

The Technical Services Division of the Water Quality Department may initiate environmental monitoring of receiving waters after major spills. A major spill is assumed to be a spill which is of sufficient magnitude to have the potential to affect water quality. The magnitude of the spill to trigger a sampling event, as well as the parameters to be monitored for, is variable depending upon several factors such as the sensitivity of the affected water and its uses (e.g., shellfish or swimming waters or sensitive spawning areas), the season of the year, or the magnitude of antecedent rainfall. Spills resulting from extreme events such as hurricanes or extreme northeaster storms will not be sampled due to the dominance of nonpoint source impacts on the receiving waters.

The Technical Services Division is responsible for environmental testing, data analysis, regulatory negotiation, reporting and administration of air and water permits, management of local storm water support programs and performs special studies to support operations. The Division has watercraft from which they can monitor receiving waters to determine the effects of discharges from HRSD facilities on the local waterways.

3.13.3.4 Industrial Waste Monitoring

HRSD's P3 Division is responsible for the control of all non-domestic waste discharged into HRSD's system. P3 regulates industrial and commercial discharges through application of HRSD's Industrial Wastewater Discharge Regulations. These regulations include general and specific effluent limitations and a discharge permit program. Compliance is ensured through the implementation of an extensive monitoring program where HRSD monitors industrial users. The industries also perform self-monitoring activities to ensure they are meeting permit limits. HRSD conducts work week long wastewater monitoring surveys of industries at least annually, where feasible, utilizing automatic samplers to collect 24 hour composite samples. In addition, all industries known to discharge toxic pollutants are grab sampled and spot checked on a random, unannounced basis.

The Laboratory Division is responsible for analytical testing and providing quality laboratory data for internal analysis and regulatory control. HRSD's state-of-the-art Central Environmental Laboratory uses the latest technology to monitor treatment processes, industrial discharges into the system, and the condition of local waterways. Some laboratory tests are completed through contract labs.

3.13.4 Training

The treatment plant operators participate in a four-year apprentice program working toward a class 1 license, which qualifies them for pay incentives.

The lab technicians are trained in house using EPA-approved methods.

3.13.5 Information Management

The Central Environmental Laboratory (CEL) Laboratory Information Management System (LIMS) is part of HRSD's integrated, interdepartmental information management systems. TIMS and the Pretreatment Information Management System (PIMS) comprise the remainder of these systems. LIMS provides storage for more than a quarter million laboratory results annually. It is used for regulatory and operational purposes by several HRSD departments and divisions. LIMS is designed to follow applicable US EPA protocols and good automated practices for sample and data management. The CEL uses LIMS for many aspects of data and sample management. LIMS functions include automated generation of analytical requests and sample labels, sample receipt, automated data transfer from instrumentation, data validation and approval, generation of data reports and data storage.

LIMS transfers data into Treatment Division's Excel spreadsheets used in TIMS. Hourly data generated at each facility is recorded and used to perform flow and process calculations. LIMS serves as a permanent repository of data for historical purposes and for cross plant reporting. In addition, it ensures the quality and completeness of collected information. Data also are automatically transferred from LIMS to PIMS. PIMS provides a comprehensive database to manage data that describe industrial users, as well as the volume and pollutant concentration of industrial discharges.

Advantages of using interdepartmental data management systems include streamlined procedures that increase efficiency, consolidated hardware and software maintenance, easier access to shared information and reduced training efforts, all of which result in an overall cost savings.

3.13.6 Resource Management

Approximately 80 employees work in the Water Quality Department under the direction of the Director of Water Quality. The Water Quality Department organization chart is shown in Appendix A, page A-21. Contract laboratories are utilized if needed to meet demand.

The Central Environmental Laboratory utilizes state-of-the-art analytical equipment.

Two large research vessels are used for ambient waters and various other vessels are used for other Water Quality purposes.

3.13.7 Process for Continuous Improvement

HRSD is working toward obtaining accreditation through the Virginia Environmental Lab Accreditation Program (VELAP).

The Laboratory Information System (LIMS) is being updated to ensure improved data quality.

The CEL develops new analytical methods as necessary.

3.13.8 Implementation Plan

Program Milestone	Description	Time frame
VELAP accreditation	Meet the standards required to obtain VELAP accreditation	Received Summer 2011
LIMS updates	LIMS Platform being updated	2012

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3.14 Regional Collaboration

3.14.1 Program Definition and Purpose

Regional collaboration is critical to the shared success of HRSD and the Localities that comprise the Regional System. The purpose of this program is to provide for ongoing coordination, communication and collaboration between HRSD and the Localities.

3.14.2 Goals and Performance Measures

Goals		Performance Measures	Target Value
Maintain positive working relationship with Localities	Meet monthly with both Capacity Team and Locality Team to review/resolve issues	Actual Number of Capacity and Locality Team meetings per year	24 per year

3.14.3 Program Description/Components

HRSD works closely with the Localities in its service area on a wide variety of programs. While these points of collaboration are numerous and of varying importance, this section provides a brief summary of the major areas of collaboration where there is significant interaction between HRSD and Localities.

3.14.3.1 Wet Weather Operation

During wet weather events, HRSD and Localities will continue to coordinate activities to optimize the operation of the regional sanitary sewer system. This coordination may include sharing of operational data such as pressure, flows, rainfall, pump run times and SSOs. When feasible, the Localities and/or HRSD may modify the operation of their respective systems to enhance the ability to convey peak flows through the system as a whole. These modifications may include such actions as bypass pumping, changing pump settings, operating system valves to divert flows, provision of emergency generators in the event of power outages, and other prudent and reasonable steps. Communications will be maintained at the operating levels of the organizations.

3.14.3.2 Flow, Rainfall and Pressure Monitoring

Localities and HRSD are collecting flow, rainfall and pressure information from their respective systems. This information will be made available amongst the entities to promote shared understanding of the performance of the regional system.

3.14.3.3 SSO Response

HRSD and the Localities have shared their respective SSO Response Plans with one another. Any updates to these plans will be shared with the other parties. During SSO Response, coordination between HRSD and the Locality occurs, as appropriate. This coordination may take the form of modified operation to mitigate the SSO, joint deployment of resources and communications of system operating conditions as appropriate to the actual circumstances. When capacity related overflows occur, HRSD and the involved jurisdiction will share and review Locality and regional system operating data to better understand system performance and to explore whether changes in the operation of existing system infrastructure could be implemented to minimize the probability of SSO occurrence and/or mitigate the SSO. HRSD will facilitate these reviews on an annual basis.

3.14.3.4 Flow Acceptance

The Region has adopted a flow acceptance process. This process is applicable to requests for new or modified flows to Locality and Regional Systems. The process provides for a uniform approach to the review of requests and a defined sequence of review between HRSD, Localities and DEQ.

3.14.3.5 Regional Design Guidelines

In conjunction with the Regional SOC, the Localities and HRSD have adopted consistent Regional Design Guidelines that govern the design of major new infrastructure until the Wet Weather Management Plan is approved. The region has conducted training on these guidelines and posted them on appropriate websites.

3.14.3.6 Sewer System Modeling

In conjunction with fulfilling the requirements of the SOC, HRSD and the Localities are collaborating on the development of models of Locality systems and the HRSD Sanitary Sewer System. To that end, a regional Model Users Group (MUG) has been formed and meets regularly to discuss modeling issues and develop consistent approaches to modeling.

3.14.3.7 Sanitary Sewer Evaluation Survey (SSES) Planning and Execution

Per the SOC, Localities and HRSD are preparing SSES Plans for their respective systems. These plans will identify which sewer basins meet the SSES basin criteria contained in the Regional Technical Standards, the schedule for investigating these basins and the approach that will be used. These plans will be shared amongst the Localities and HRSD via a website or other appropriate means and reviewed by DEQ. The field activities are scheduled for completion by November 26, 2011. As results are developed, they will be shared amongst the Localities and HRSD. The forum for sharing results will be the Capacity Team meetings and the monthly Locality meetings.

3.14.3.8 Fats, Oils and Grease (FOG) Control Programs

Through the Hampton Roads Planning District Commission (HRPDC), HRSD and the Localities have developed the outline of a regionally consistent FOG control program. A working group has prepared several model documents that are being considered for adoption by Localities. HRSD has been an active participant in this process. The major components of the proposed program are as follows:

3.14.3.8.1 Memorandum of Agreement (MOA)

The regional FOG program in Hampton Roads is designed to address both near term and long term goals for improvement in the regional sanitary sewer system. Existing efforts include utilizing the authority given to the HRSD by EPA's National Pretreatment Program. This enforcement relationship has been in existence for many years and is effective in dealing with the worst FOG contributions to the regional system. In an effort to more clearly define the roles of the Localities and HRSD, a regional Memorandum of Agreement has been developed to formally document this working relationship.

3.14.3.8.2 Model Ordinance

A model ordinance has been developed and reviewed by area Utility Directors and local attorneys. The ordinance includes provisions for GCD requirements for new food service establishments (FSEs), as well as retrofits for FSEs shown to be contributing significant FOG to the regional sanitary sewer system.

In addition, a new training requirement for both grease haulers and FSE employees has been established. Work has begun on developing these training modules. Trainings will be delivered on a regional basis, with a long-term goal of providing training and certification on-line.

3.14.3.8.3 Enforcement Response Plan (ERP)

The purpose of the ERP is to establish general responsibilities for enforcement of the Model FOG Ordinance.

The ERP details an iterative process for addressing FOG contributions to the system. Compliance assistance, notice of violation, water and sewer service termination and legal action are all available as enforcement mechanisms.

3.14.3.8.4 Grease Control Device (GCD) Design & Sizing

Design and sizing guidelines have been developed by a regional technical committee. Participants gathered field data from local FSEs and reputable grease haulers to provide validity to GCD size and maintenance requirements. Based on the data, it is anticipated that most FSEs will require a GCD of 750- to 2,000-gallon capacity, depending upon the nature of the operation.

3.14.3.9 Memorandum of Agreement

In conjunction with the SOC from DEQ, the Localities and HRSD have entered into a Memorandum of Agreement (MOA) which provides for mutual accountability. The MOA outlines the roles of the parties, requires compliance with the Regional Technical Standards, outlines development of the Regional Wet Weather Management Plan (RWWMP) and compliance with the RWWMP after approval and provides a dispute resolution process. The MOA is founded on the following four principles:

1. While each Utility has an individual responsibility to operate, maintain and improve their system, there is also a shared responsibility to ensure that the systems function effectively and efficiently as part of the larger regional system.
2. A cooperative and collaborative approach among the Utilities will help ensure that the region's sewage collection and treatment needs are served cost effectively and that water quality is protected.
3. Each Utility should own and operate its system efficiently and cost effectively while not adversely impacting the service provided by or to any other Utility.
4. The cost of identifying and implementing regional system enhancements to reduce the occurrence of unpermitted discharges should be shared equitably amongst the Utilities and minimized as practicable for the lowest overall impact to the ratepayers of the region.

3.14.4 Training

3.14.4.1 Education & Information

A regional FOG education committee has begun work on key components of an information and education initiative. A Communications Plan is under development, which will include a regional website, advertising, publications and promotional tools.

Some initial public information and education work has already been done, which includes:

- Domain registration of www.hrfog.org.
- Distribution of a regional newspaper tabloid to all third graders in the region, which includes a section on FOG issues.
- Creation and distribution of a factsheet on Turkey Frying for use by all regional partners. This factsheet is also available on the regional FOG webpage, www.hrfog.com.
- News releases regarding proper FOG disposal after turkey frying have been distributed prior to key holidays in calendar years 2007 and 2008.

- Public Affairs Programming with media partner WVEC—a special segment of Dialogue, which will air in the weeks prior to Thanksgiving and Christmas 2008, was taped on November 12, 2008. This show will be duplicated and aired on area municipal cable stations, as well as being posted to hrfog.org and a regional YouTube channel, HR Green.
- A brief PowerPoint presentation on FOG has been developed for use by Localities in communicating with the general public at meetings of such groups as civic leagues, Home Owners Associations, Non-Governmental Organizations, etc.

3.14.5 Information Management

Locality and regional collaboration is documented through meeting minutes and stored on HRSD's collaboration website, www.hrsdlive.com.

3.14.6 Resource Management

The Special Assistant for Compliance Assurance is responsible for issues regarding Regional Collaboration. The Special Assistant for Compliance Assurance reports to the General Manager.

3.14.7 Process for Continuous Improvement

The SOC requires that "HRSD and the Localities shall develop and implement a private property I/I abatement program. The Private Property I/I Abatement Program will require, to the extent allowed by law, the correction of identified private system deficiencies." In order to accomplish this requirement, a Private Property I/I Abatement Committee has been formed to develop the framework for a regional program. This group is composed of technical and legal representatives from Localities and HRSD.

3.14.8 Implementation Plan

Program Milestone	Time Frame
Private Property I/I Abatement Program	Initial development October 31, 2010, implementation thereafter.

3.15 Engineering Design and Construction

3.15.1 Program Definition and Purpose

The HRSD Engineering Department is established to ensure that new or improved HRSD infrastructure is designed in accordance with applicable standards, codes, and guidelines, and is inspected and built to the specified standards. The Engineering Department also provides planning services for the Capital Improvement Program (CIP) and maintains the GIS.

3.15.2 Goals and Performance Measures

The goals of HRSD's Engineering Design and Construction Program are:

- Design and construct new and rehabilitated infrastructure projects that comply with design standards, laws, rules, and regulations.
- Perform new and rehabilitation projects in an effective and efficient manner that also protects the environment during construction.
- Create a prioritized CIP based on a comprehensive set of criteria to support capital planning and spending.
- Maintain accurate and up to date system maps and system engineering details.

Goals		Performance Measures	Target Value
Engineering - CIP Planning	Implement a prioritized CIP based on a comprehensive set of criteria to support capital planning and spending.	(Actual # of CIP projects completed in FY / Proposed # of CIP projects planned for completion in FY) x 100%	98%
Maintain System Maps	Accurate and up to date system maps and engineering details are important to maintaining and operating the system.	Provide timely update of system changes by revising engineering drawings and GIS information. Number of changes recorded within 30 days when information is submitted / Number of changes submitted to engineering	100%
Engineering - Standards	Maintain updated *Engineering Project Guidelines Manual* and the *Standards and Preferences for Engineered Construction Projects*	No. of reviews and/or updates in accordance with newly published standards or "Lessons Learned	1 per year

3.15.3 Program Description / Components

The Engineering Department provides standards for the installation of new sewers, pumps, and other appurtenances, and rehabilitation and repairs by following: *Engineering Project Guidelines Manual, Standards and Preferences for Engineered Construction Projects*, and *HRSD Standards and Other Details*. The VA Sewer Collection and Treatment regulation is also used as a design standard. The Hampton Roads Planning District Commission's *Regional Construction Standards* is a supplement to the HRSD Standards. The Localities are also encouraged to use this document in their design efforts.

HRSD and the Localities agreed on Regional Design Guidelines (RDG) as part of the process leading up to the State Special Order by Consent. These RDG are included in Exhibit A of the Regional Technical

Standards and govern the design of facilities between the date of the SOC and the Regional Wet Weather Management Plan (RWWMP). In part, they read as follows:

> "Until the Regional Wet Weather Management Plan is complete, design of any new or enhanced major sewer infrastructure (i.e., regional pump station, major interceptors, etc.) must anticipate the future performance standards that will result from the outputs of the consent order. HRSD agrees to revisit its design standard for interceptors that may be designed and constructed prior to the Regional Wet Weather Management Plan.
>
> The regional design standards will be based on the following assumptions:
>
> - Peak hourly residential wastewater flow of 250 gallons per capita per day at an assumed 3.1 persons per household, or 775 gallons per residential unit per day; plus
> - Peak hourly commercial/industrial wastewater will be based on actual flow, if available, or 3 times the average projected water consumption, if not available.
>
> HRSD, the Hampton Roads Localities and DEQ agree to adopt these standards for design."

HRSD construction and rehabilitation projects are normally supervised and inspected through a contractual arrangement with the design engineer. Smaller projects are often inspected by in-house staff. As part of the plans and specifications for new projects, strict procedures for testing the facilities are implemented and overseen by the design engineer, HRSD engineering staff project manager, and inspector.

These procedures include the following:

- Collect horizontal and vertical information on installed bends, fittings, valves and established lengths along the installed pipeline to verity grade and alignment and for accurate Record Drawings.
- Install force main on design grades. Inspector to verify slope and coordinate with Engineer if an undocumented underground utility or other obstacle results in a grade change.
- Maintain established horizontal and vertical separation from other utilities during installation. Inspector to confirm minimum separations and coordinate with the Engineer if these separations cannot be maintained due to an undocumented underground utility.
- Visual observations are made on the integrity of pipeline coatings such as polyethylene wrap, bonded tape wrap coatings or bonded coatings prior to installation and during backfilling.
- Cathodic protection systems are continuity tested for isolation and impressed current systems are initially tested for continuity.
- Interior lining for pipelines are inspected prior to installation for damage and an appropriate repair made in accordance with the lining manufacturer's recommendations and procedures if damage is observed.
- Limit the allowable pipe joint deflection per AWWA C600.
- Hydrostatic Pressure Testing of installed Force Mains in accordance with AWWA C600.
- Visual inspection of any pipe joint not hydrostatically tested following pipeline being restored to normal operating pressure. Any observed leaks to be fixed.
- New gravity sewer mains to be tested for allowable deflection by a mandrel pulled through the pipeline.
- New gravity sewer mains to be tested by infiltration, exfiltration or air methods in accordance with Virginia Department of Environmental Quality regulations.
- CCTV evaluation of installed gravity main for proper alignment and the elimination of any sags.

- Conduct field testing and acceptance of pipe, valve and appurtenances per project specifications and applicable AWWA and ANSI standards.
- Pumps checked for vibration, cavitation, excessive heat, etc. per the project Technical Specifications.
- Conduct pre and post rehabilitation CCTV for gravity sewer rehab projects.
- Conduct pre and post visual evaluation of rehabilitated manholes.

HRSD has the authority to ensure the proper installation, testing, and inspection of new and rehabilitated sewers in all parts of the overall system including those within the Localities being served by HRSD. Section 40 of the Hampton Roads Sanitation District Commission Enabling Act states that the Commission has the right to inspect all new construction and refuse service to any new sewer extension or improvement that would result in injury to the sewerage system.

The Engineering Department also includes a Planning and Analysis Division that performs data analysis, project planning, hydraulic analysis, and GIS management. The Planning and Analysis Division is also responsible for creating the prioritized CIP using defined procedures to evaluate the relative priority of the candidate projects based on established criterion.

3.15.4 Training

HRSD Engineering Department only hires persons qualified by education and experience for positions in the Engineering Department. A specific orientation program is created for each new hire based on the new employees individual background and HRSD duties. Additionally, an individual mentoring plan is developed for each new Project Manager. The Engineering Project Guidelines Manual is also used as a training reference.

Funds are budgeted to pay for professional employees to obtain continuing education credits by attending work-related training which may include industry conferences and seminars.

3.15.5 Information Management

Two HRSD documents provide the basis for the Engineering Department project procedures and design standards: *Engineering Project Guidelines Manual* and the *Standards and Preferences for Engineered Construction Projects* These documents are the responsibility of the Director of Engineering. The *Standards and Preferences for Engineered Construction Projects* is available on HRSD's public web site, www.hrsd.com. The *Engineering Project Guidelines Manual* is maintained on HRSD's intranet SharePoint site.

HRSD keeps construction related drawings for existing plant, pump station, pipeline, and administration facilities in electronic format, and copies can be requested on HRSD's public web site, www.hrsd.com. The Director of Engineering is responsible for maintaining these records.

Once projects are completed by the Engineering Department, appropriate documentation is maintained in the GIS and/or CAD systems. This information is accessible through the HRSD Intranet. The Director of Engineering is responsible for maintaining the GIS/CAD records.

3.15.6 Resource Management

The Engineering Department is composed of 29 full-time employees (FTE) led by the Director of Engineering, who is also a procurement officer for CIP professional and construction related services. More specific information on staffing can be found in the Engineering organization chart located in Appendix A, page A-3.

The Engineering Department Design and Construction staff members are deployed geographically into two divisions: North Shore Design and Construction and South Shore Design and Construction. There is a Chief for each division. Consistent use of the applicable standards is applied by both locations to ensure uniform practices. The Planning and Analysis Division is the third division in the Engineering Department.

Engineering consultant firms (up to 75 FTEs) are used extensively for design of capital projects and up to 500 contractor FTEs perform construction work under the direction of the Engineering Department.

A number of compliance-related projects are currently being implemented, and HRSD staffing levels will be evaluated to determine if permanent augmentation is needed.

3.15.7 Process for Continuous Improvement

Upon completion of capital projects, HRSD grades consultants and contractors based on safety performance, schedule compliance, and rules compliance. These grades provide a means of improving performance on subsequent projects and identifying deficient performers.

The Standards and Preferences (S&P) Committee within HRSD provides improvements to standards based on experience and technology developments. The S&P committee and sub committees are made up of roughly fifty members from all of the Operations Department divisions as well as representatives from the Localities. It is divided into Subcommittees, each with a Team Leader and several Team Members, as follows: Pump Stations, Treatment Plants, Miscellaneous, Electrical/Instrumentation, Pipelines, No Dig/Rehabilitation, and Distributed Control System Automation. The S&P committee proposes and evaluates improvements in the *Standards and Preferences for Engineered Construction Projects*, and *HRSD Standards and Other Details* documents.

In the next review of the standards for construction of new and/or rehabilitated interceptors, the Engineering Department in consultation with the Operations Department will evaluate the feasibility and cost effectiveness of providing operational flexibility and access points for internal inspection. If feasible and cost effective, these measures will be added to the standards.

The Engineering Department Planning and Analysis Division maintains a prioritized list of proposed capital projects for use in capital program planning. Each project is given a priority based on uniform criteria. The list is reviewed annually, and the replacement planning model is used to collect this information.

Master Specifications are being developed for frequently used equipment on typical projects to save the development of individual specs for each time the equipment is purchased. This minimizes errors of understanding between the design consultant and construction contractor.

HRSD is exploring the implementation of an Enterprise Project Management System to provide enhanced reporting information on project costs, schedule, and other project performance indicators. Information from this system would be integrated with the current fiscal and GIS databases.

3.15.8 Implementation Plan

None identified.

3.16 Post-RWWMP Capacity Assessment

3.16.1 Program Definition and Purpose

HRSD will perform a capacity assessment of its system every two years after completion of the Regional Wet Weather Management Plan (RWWMP) improvements using available data, tools and technology.

3.16.2 Goals and Performance Measures

The goals of HRSD's Post-RWWMP Capacity Assessment Program are to:

- Provide estimates of the capacity of key components
- Identify hydraulic deficiencies

Goals		Performance Measures	Target Value
Post-RWWMP	Conduct capacity assessments every 2 years using available tools, data, and technology.	Perform capacity assessment once every two years following-RWWMP approval.	Capacity assessment every two years.

3.16.3 Program Description / Components

A capacity assessment will utilize available system data (flows, pressures, SSOs, etc.) along with hydrologic and hydraulic modeling.

3.16.3.1 Post-RWWMP Capacity Assessments

HRSD commits to conducting capacity assessments every 2 years to its sanitary sewer system following – RWWMP approval by hydraulic evaluation using tools, data, and technology available at the time of the assessment.

3.16.4 Training

HRSD Engineering Department includes a Planning and Analysis Section that includes persons experienced with hydraulic modeling. A specific orientation program is created for each new hire based on the new employees individual background and HRSD duties. Additionally, an individual mentoring plan is developed including the Hydraulic Analysis Manager (HAM). Funds are also budgeted to pay for professional employees to obtain continuing education credits by attending work-related training which may include industry conferences and seminars.

3.16.5 Information Management

The HAM will utilize various tools including the Regional Hydraulic Model, Flow, Pressure, and Rainfall Monitoring data as well as currently available tools to perform capacity assessments.

Once analyses are completed by the HAM, appropriate documentation is maintained in the GIS and/or CAD systems. This information is accessible through the HRSD Intranet.

3.16.6 Resource Management

The Planning and Analysis Division headed by the Chief of Planning and Analysis who holds the responsibility of the capacity assessment post-RWWMP. Actual work will be completed by the HAM.

3.16.7 Process for Continuous Improvement

HRSD will refine the process of capacity assessment upon completion every two years.

3.16.8 Implementation Plan

None identified.

4. IMPROVEMENT PROGRAM AREAS

HRSD is committed to continuous improvement in the MOM programs. This section identifies specific areas where HRSD will focus attention to enhance existing programs in the near term future (one to two years). As part of the improvement process, HRSD will revisit these improvement areas annually to measure progress, adjust actions, identify new areas for improvement, move areas completed off the improvement list and make other adjustments as necessary to reflect circumstances at the time of the evaluation.

4.1 Flow, Pressure and Rainfall Monitoring Program

A comprehensive Flow, Pressure and Rainfall (FPR) Monitoring Program has been implemented throughout HRSD's system. This program is placing measuring equipment at HRSD pump stations, PRS facilities and at key locations within the interceptor system. This program will collect one year of flow and pressure data. The data collected during this period will be used to calibrate the Regional Hydraulic Model that will be used for the preparation of the Regional Wet Weather Management Plan (RWWMP).

In the longer term, data collected through this program will be used to understand system performance to provide input to operations, maintenance and capital decisions. The system will be adjusted, as necessary, to reflect information needs in the system. The network being installed to provide data to perform the calibration of the Regional Hydraulic Model and is much more extensive than what is needed for everyday operational decision making. After the initial data collection period, HRSD will evaluate the network and may elect to eliminate or relocate original points in the network to assist in future operations. The system will be evaluated periodically thereafter to identify adjustments that may be desirable.

4.2 Hydraulic Modeling

The SOC requires the development and calibration of a dynamic regional hydraulic model. HRSD has an existing hydraulic model that has been in use for a number of years for operating and planning decisions. The existing model is steady-state model that has some limitations that will be overcome through the development of the dynamic model. Development and calibration of the dynamic model is a major project that will require many resources, data from the Flow, Pressure and Rainfall Monitoring Program and several years to complete. Initial calibration of the regional hydraulic model was achieved by November 30, 2010. HRSD is currently developing final calibration of the model and documentation. HRSD will use the results of the dynamic model to assess capacity in specified portions of the regional system, for operational decisions such as flow diversions and for planning purposes.

4.3 Regional Wet Weather Management Program

HRSD, in conjunction with the 13 Localities that are parties to the SOC, is preparing a Regional Wet Weather Management Plan. In preparing this Plan, HRSD will assess capacity in the specified portions of the system and Localities will assess capacity in their systems under various levels of service. HRSD and the Localities will assess the feasibility, cost, affordability and benefits of achieving these various levels of service and select a level of service. This level of service will then be used to develop alternatives to providing adequate capacity in HRSD and Localities' systems. These alternatives may include improvements in Localities' systems, improvements in HRSD's system and/or joint improvements at the points of system interface. The selected alternative solution set will then be further developed in terms of cost and implementation schedule. This process will be highly collaborative amongst HRSD and the Localities and will define the long term capital program for enhancements necessary to achieve the selected level of service. Implementation of the Plan will require ongoing collaboration amongst the regional partners and appropriate phasing of the projects. The Plan is scheduled for submittal to EPA and DEQ by November 26, 2013. The Consent Decree provides for an extension to not later than July 31, 2014, if the Parties to the Consent Decree agree. The Implementation Phase is expected to require a substantially longer period of time, which will be defined in the Plan.

4.4 Fats, Oils and Grease (FOG) Control

As noted in Section 3.11, HRSD is actively participating in the development of a regionally enhanced FOG program in close collaboration with Localities. This enhanced program will provide for more inspection of FSEs, consistent enforcement approaches, regional education programs and regional cooperation. It is expected that this regional program will require several years to implement as it involves local ordinance revisions, resource allocation, as well as outreach and education to the impacted stakeholders. Over this period of time and after the initial implementation is completed, HRSD will remain an active participant.

4.5 Condition Assessment Activities

The SOC requires that HRSD and Localities assess their respective systems to identify, prioritize and correct defects that contribute to SSOs and high peak flows through infiltration and inflow. Initially, this assessment will be conducted over a period of several years culminating with completion of SSES field activities under the SOC by November 26, 2011. These activities provide the input to prepare a Rehabilitation Plan that must be submitted to DEQ for review and approval by November 26, 2012. These assessment activities will include HRSD pump stations and PRSs, force main interceptors and gravity interceptors.

Throughout this period HRSD will be refining the existing condition assessment programs including pump station inspections, CCTV inspection of pipelines and related activities. In addition to the condition assessment activities required by the SOC, HRSD will be enhancing the ongoing programs to assist in operational, maintenance and capital planning activities.

4.6 Flow Acceptance Process

HRSD, in collaboration with the Localities and DEQ, has developed a Flow Acceptance Process to be used to evaluate new connections to the system. This process has been in place for several months and will be undergoing refinements as it is further developed. The current process is outlined in Section 3.5 of this document.

4.7 Private Property Inflow and Infiltration (I/I) Abatement Program

The SOC requires that "HRSD and the Localities shall develop and implement a private property I/I abatement program. The Private Property I/I Abatement Program will require, to the extent allowed by law, the correction of identified private system deficiencies." In order to accomplish this requirement, a Private Property I/I Abatement Committee has been formed to develop the framework for a regional program. HRSD and the Localities are developing a regional private property I/I abatement program.

4.8 MOM Consistency

Due to the relative short period of time the collection system and treatment plants on the Middle Peninsula (Small Communities Division) have been a part of HRSD, many of the practices, documentation and measures associated with the management, operation and maintenance of these facilities have not been fully aligned with the remainder of HRSD.

To ensure consistency throughout HRSD, a programmatic approach will be undertaken to develop practices, measures and implement improvements in the Middle Peninsula system consistent with those that have been identified under the MOM Program.

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5. AUDITS AND PERFORMANCE EVALUATION OF MOM PROGRAM

5.1 MOM Program Audits

Audits and performance evaluations of HRSD's MOM Program will occur at intervals of approximately three years, with an initial audit and evaluation one year after approval of the RWWMP and every three years there after, to evaluate changes and/or deficiencies in the MOM program and steps to respond to them. Revisions, as appropriate, will be made as results of the audit and evaluation and other circumstances indicate.

Audits will include evaluation of each MOM program element for consistency with current program elements. Changes in processes or procedures shall be updated during these audits.

5.2 Performance Evaluations

The system performance data will be reviewed in conjunction with the program element performance measures identified in Sections 2 and 3 of this document. When analyzed together, this relevant information will allow diagnosis of any areas that need adjustment, additional resources or increased emphasis.

Although the MOM document will be reviewed and updated on a 3-year basis, the overall system performance will be evaluated on an annual basis.

Tables 5-1 through 5-4 are tools for identification and review of trend information over a 4-year period. Table 5-1 is a collection of system characteristics such as length of pipe and number of pump stations. Table 5-2 is production data such as millions of gallons of wastewater treated and number of point repairs. This information helps evaluate the overall effort being put forth in the system. Table 5-3 presents data on the number and cause of overflows and STP releases. Table 5-4 presents data on the volume of overflows and STP releases by cause. Particular attention will be paid to wet weather related SSOs and STP releases. Monitoring overflow volumes at HRSD's STPs can be used to identify whether overflow volumes or excess flows are being shifted from the collection system to the STPs (or vice versa) with no actual reduction in the overall volume. System performance only measured by overflow volumes in the collections system may show decreasing volumes, however, these volumes may simply have been pushed downstream to the STPs where new overflows could occur.

The annual assessment complements ongoing internal audit of system data and provides an opportunity to reflect on the current year's performance data and compare results with recent year's performance data to determine if there are any trends which identify the need for program adjustments. Two important trends to monitor that are indicative of overall net performance are SSOs and STP releases. In addition to monitoring trends over time for each of these outcome based measures, a review of the relationship, if any, between these measures will be conducted. For instance, if wet weather related SSOs are increasing in a particular STP service area, are wet weather related STP releases also trending up? This effort helps to focus improvement initiatives in areas that have a direct impact on system performance. Results and trends noted from the internal audit and performance assessment will be communicated to appropriate parties both within and beyond HRSD by means of HRSD's webpage and other communications programs. The results and trend could provide necessary data to revise practices and procedures. Prior to 2010, system performance information has been tracked on a calendar year basis. HRSD will migrate to reporting on a fiscal year basis beginning in July 2010.

Table 5-1. MOM Program Performance Assessment Report, Part I

Part I. Sewer System Characteristics:	2007	2008	2009	2010*
Total length of gravity sewer (ft)	270,150	270,000	270,000	311,000
Total length of force main (ft)	2,276,000	2,279,000	2,282,000	2,745,000
Total number of manholes	1,505	1,504	1,504	1,353
Total number of pump stations	67	67	66	67
Total number of pressure reducing stations	15	15	15	15

Table 5-2. MOM Program Performance Assessment Report, Part II				
Part II. Production Data:	2007	2008	2009	2010*
Total billion gallons of wastewater treated	54.29	54.38	59.51	NA
Total lf of sewer main CCTV inspected	23,453	21,413	12,855	NA
Total number of point repairs	38	121	54	NA
Total number of manholes inspected	20	37	104	NA
Total lf sewer mains replaced	24,753	14,283	9,085	NA
Total lf sewer mains rehabilitated	350	57	642	NA
Total number of manholes rehabilitated	0	0	0	NA
Total Miss Utility Tickets	60,365	52,365	45,356	NA
Total LF Force Main Inspected	NA	NA	NA	NA
Total Number of FM Point Repairs	80	132	56	NA
Total LF FM Replaced	16,398	20,493	22,121	NA
Total LF FM Rehabbed	1,030	0	0	NA

** 2010 data begins reporting on a fiscal year basis and includes data from July 1 2010 to June 30, 2011. Not all data available as of July 1, 2011; NA=Not Available*

Table 5-3. MOM Program Performance Assessment Report, Part III-A				
Part III. -Performance Data, number:	2007	2008	2009	2010*
Total Number of SSOs:	23	15	95	NA
SSOs (#/%): caused by:				
Maintenance, Roots	0	0	0	NA
Maintenance, Debris	0	1	0	NA
Maintenance, Grease	0	1	0	NA
Power Loss	0	0	1	NA
Damage by Others, (Third Party Actions)	6	4	6	NA
Capacity, wet weather related	0	0	74	NA
Infrastructure, Gravity Main failures	0	0	0	NA
Infrastructure, Force main failures	9	7	13	NA
Infrastructure, Pump station failures	8	2	1	NA
Total:	23	15	95	NA
Total Number of STP Releases**	1	11	10	NA
STP Releases Wet Weather Related	0	1	3	NA
STP Releases, Maintenance	1	2	0	NA
STP Releases, Third Party	0	3	2	NA
STP Releases, Other	0	5	5	NA

** 2010 data begins reporting on a fiscal year basis and includes data from July 1, 2010 to June 30, 2011. Not all data available as of July 1, 2011 NA = Not Available*

***STP releases tracked in this program will be wastewater receiving less than secondary treatment.*

Table 5-4. MOM Program Performance Assessment Report, Part III-B				
Part III. -Performance, Data, volume:	2007	2008	2009	2010*
Total Overflow Volume, gallons	834,435	22,330	2,744,936	NA
Overflow volumes (gallons) caused by:				
Maintenance, Roots	0	0	0	NA
Maintenance, Debris	0	1,100	0	NA
Maintenance, Grease	0	1,050	0	NA
Power Loss	0	0	11,250	NA
Damage by Others, (Third Party Actions)	439,800	8,825	6,770	NA
Capacity, wet weather related	0	0	2,300,077	NA
Infrastructure, Gravity Main failures	0	0	0	0
Infrastructure, Force main failures	352,565	11,055	416,939	NA
Infrastructure, Pump station failures	42,070	300	9,900	NA
Total overflow volume (gallons):	834,435	22,330	2,744,936	NA
Total Volume of STP Releases (gallons)**	0	14,850	1,562,990	NA
STP Releases Wet Weather Related	0	300	1,551,100***	NA
STP Releases, Maintenance	0	1,300	0	NA
STP Releases, Third Party	0	10,550	290	NA
STP Releases, Other	0	2,700	11,600	NA

** 2010 data begins reporting on a fiscal year basis and includes data from July 1 2010 to June 30, 2011. Not all data available as of July 1, 2011; NA=Not Available*

***STP releases tracked in this program will be wastewater receiving less than secondary treatment.*

****Wet Weather Related releases caused by unusually wet record and severe nor'easter storms.*

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APPENDIX A – HRSD ORGANIZATIONAL CHARTS

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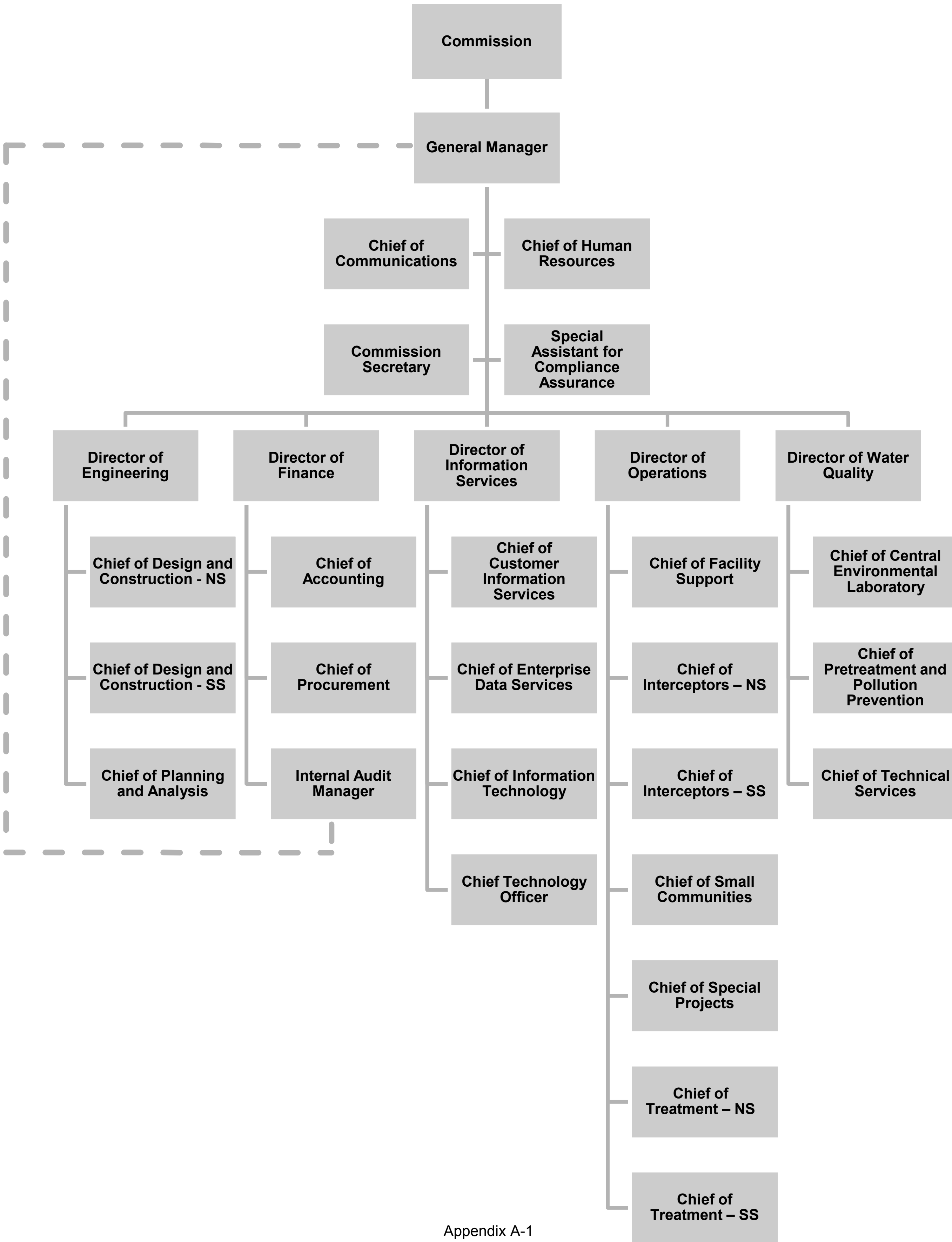
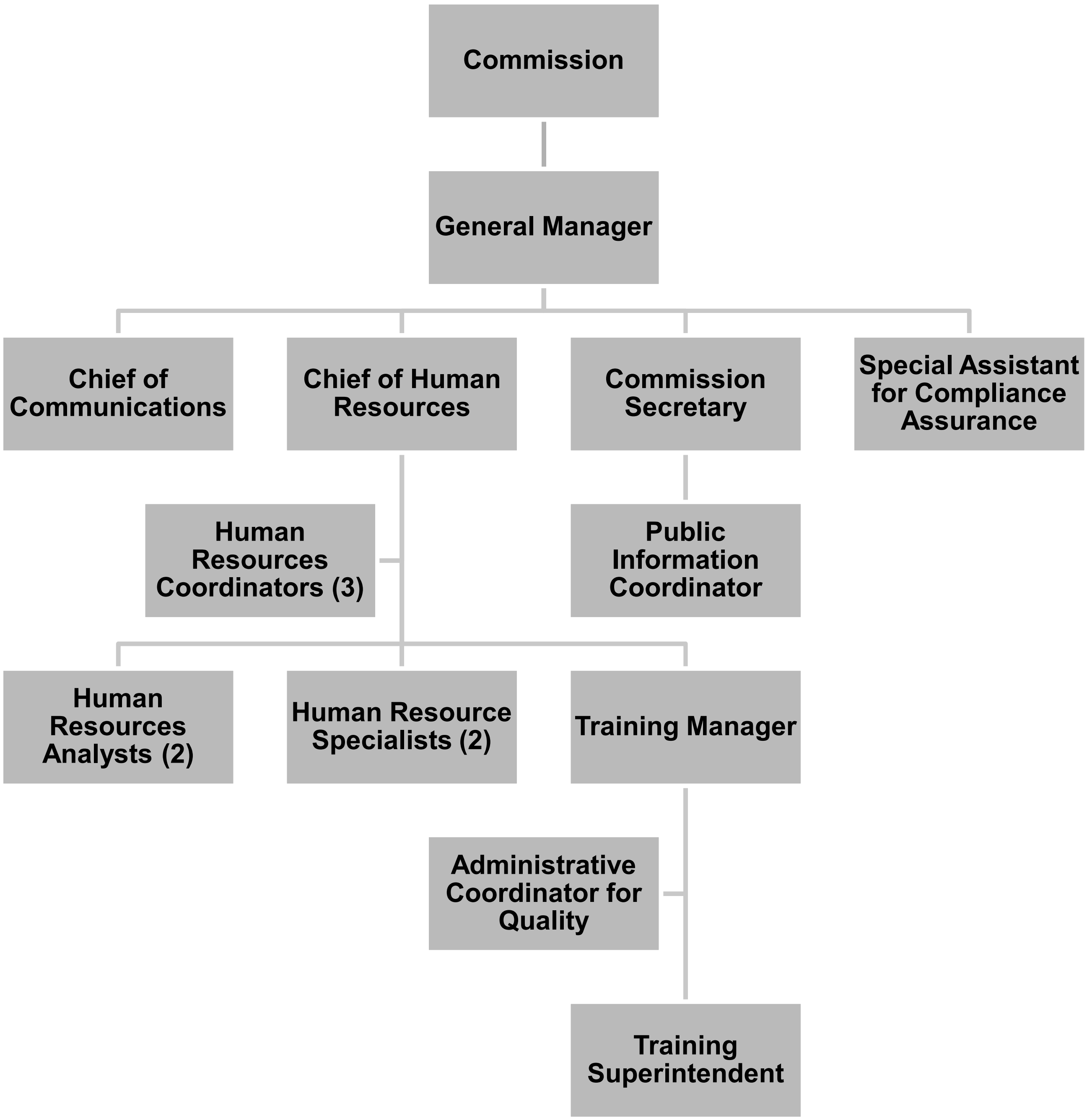
HRSD ORGANIZATION CHART

July 1, 2009



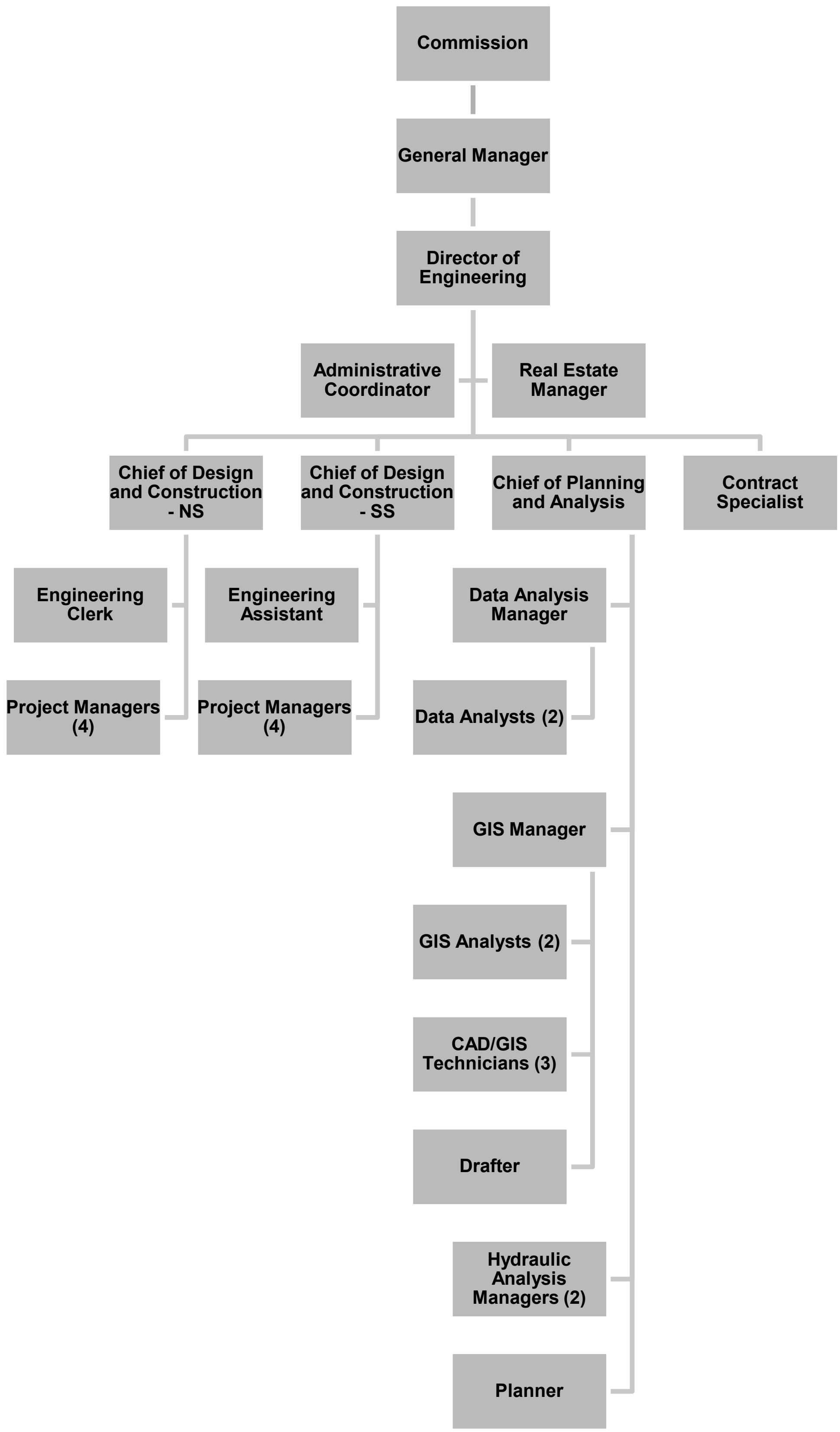
HRSD – GENERAL MANAGEMENT ORGANIZATION CHART

July 1, 2009



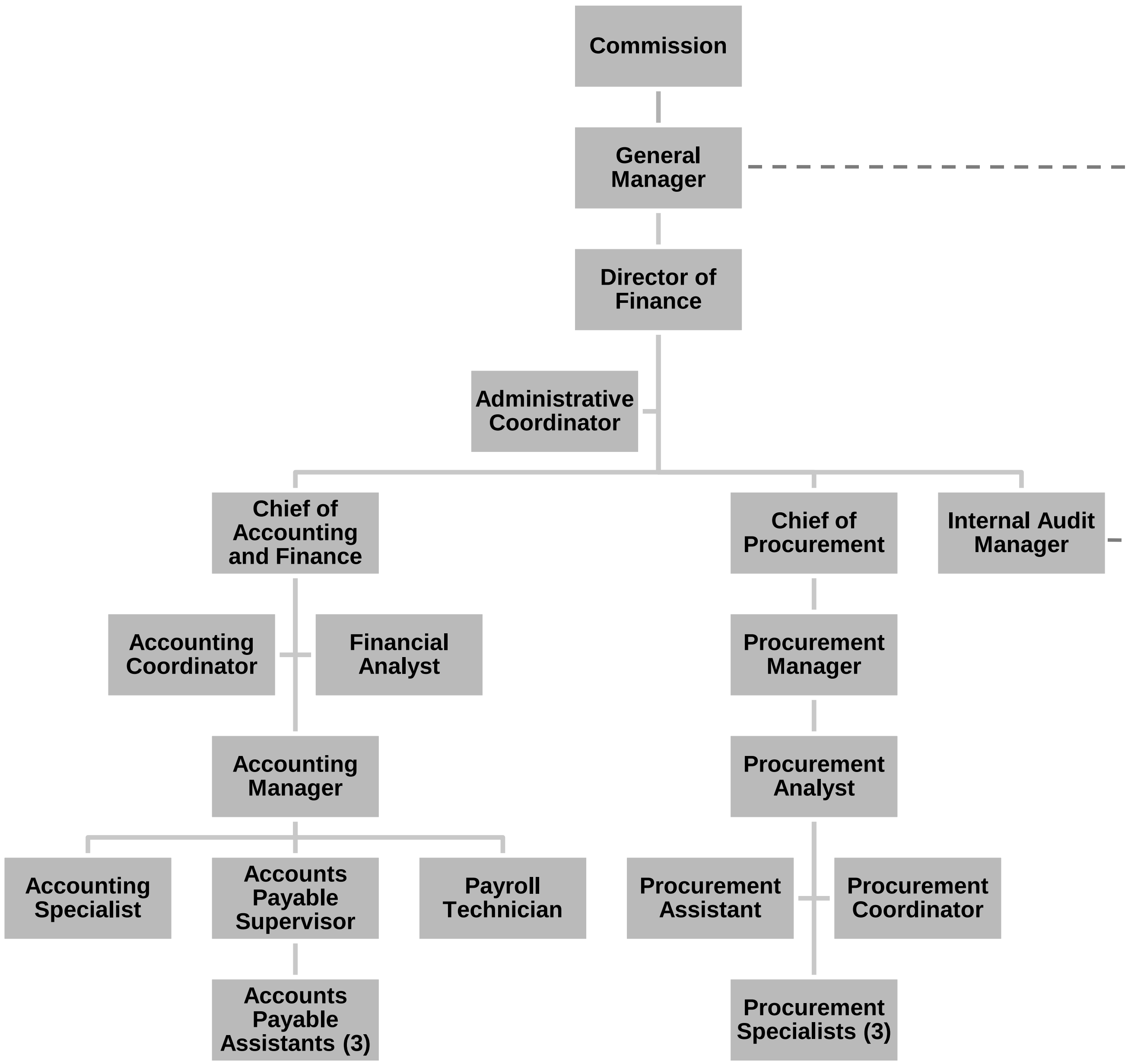
HRSD – ENGINEERING ORGANIZATION CHART

July 1, 2009



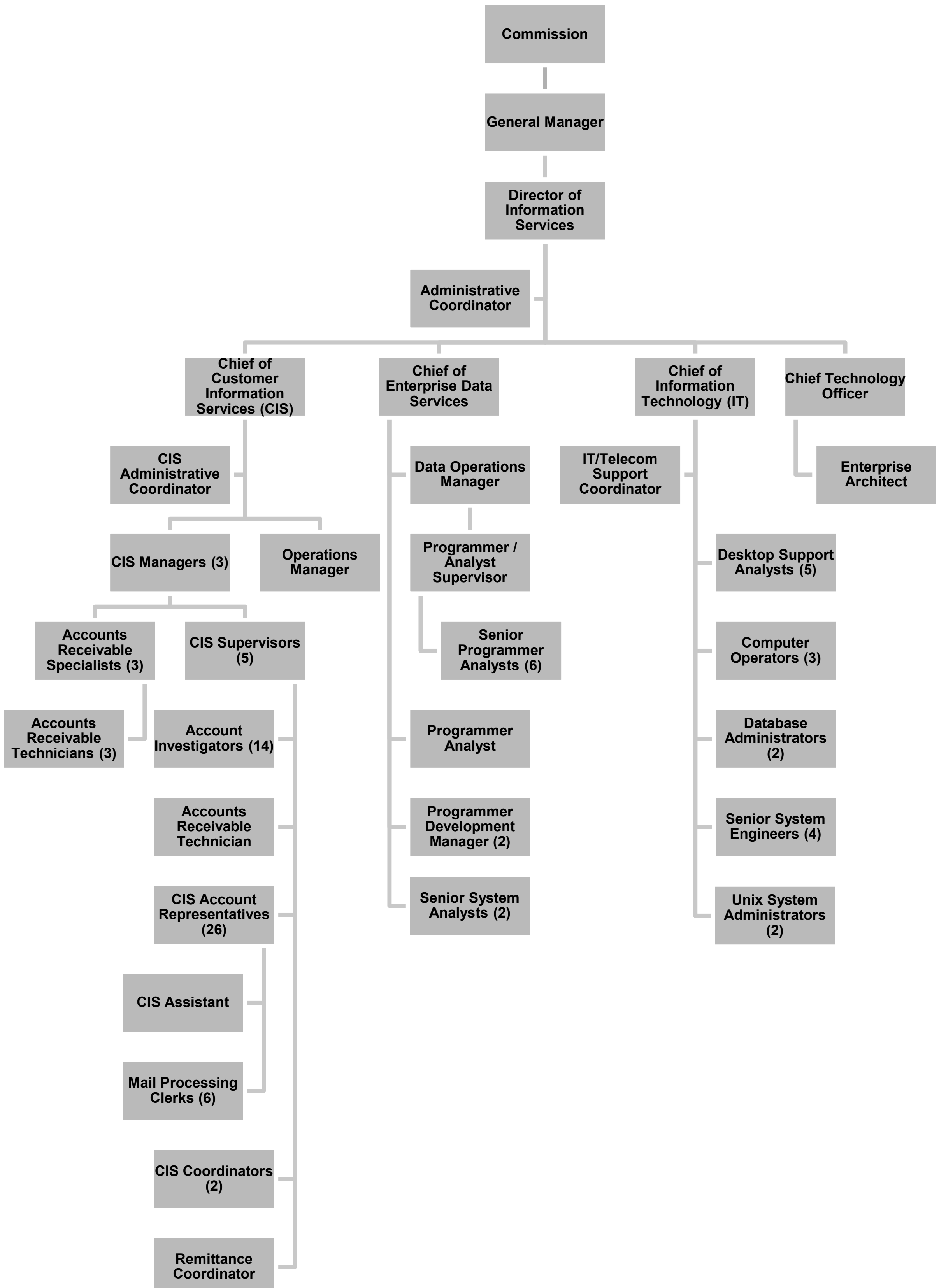
HRSD - FINANCE ORGANIZATION CHART

July 1, 2009



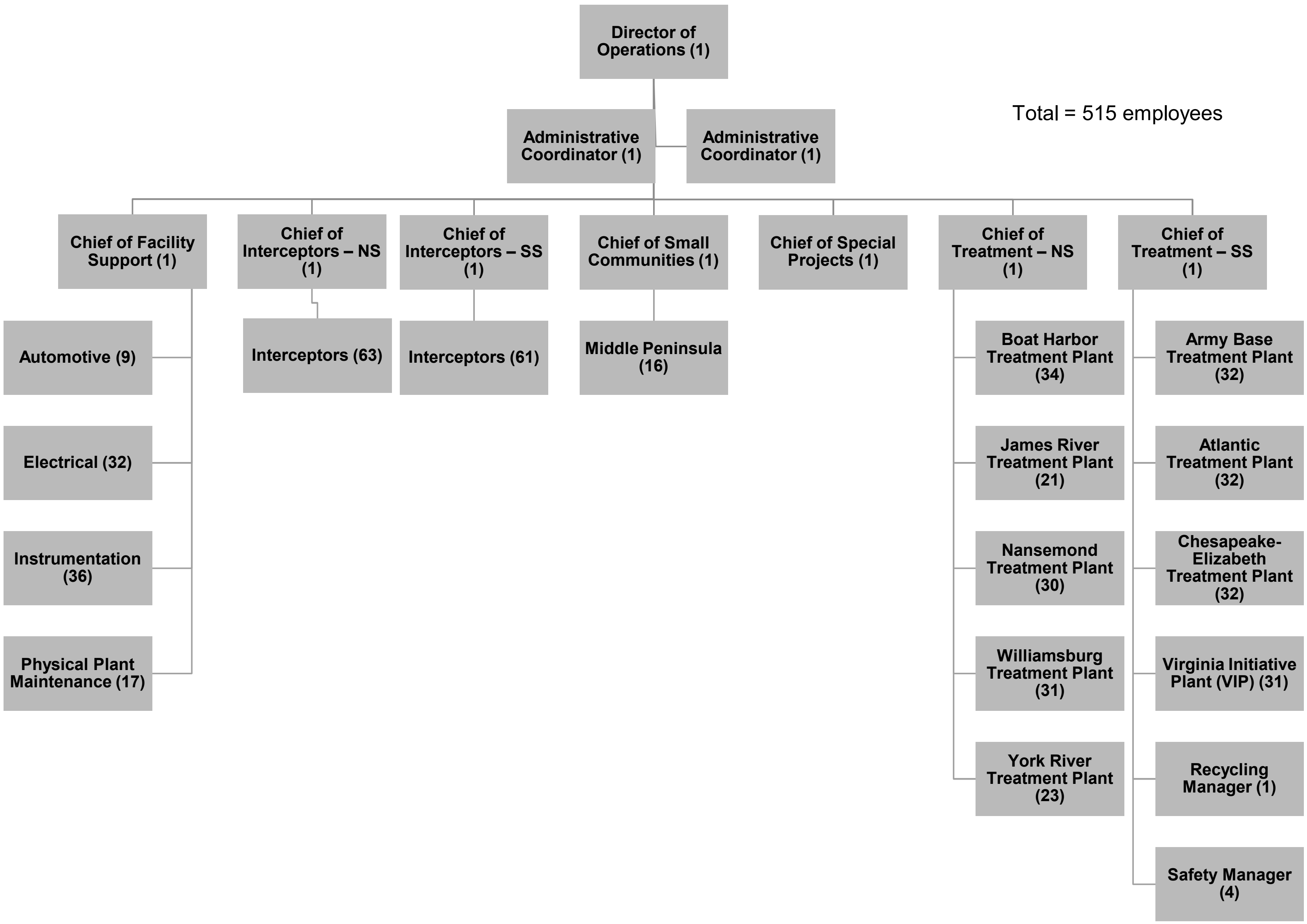
HRSD – INFORMATION SERVICES ORGANIZATION CHART

July 1, 2009



HRSD – OPERATIONS ORGANIZATION CHART

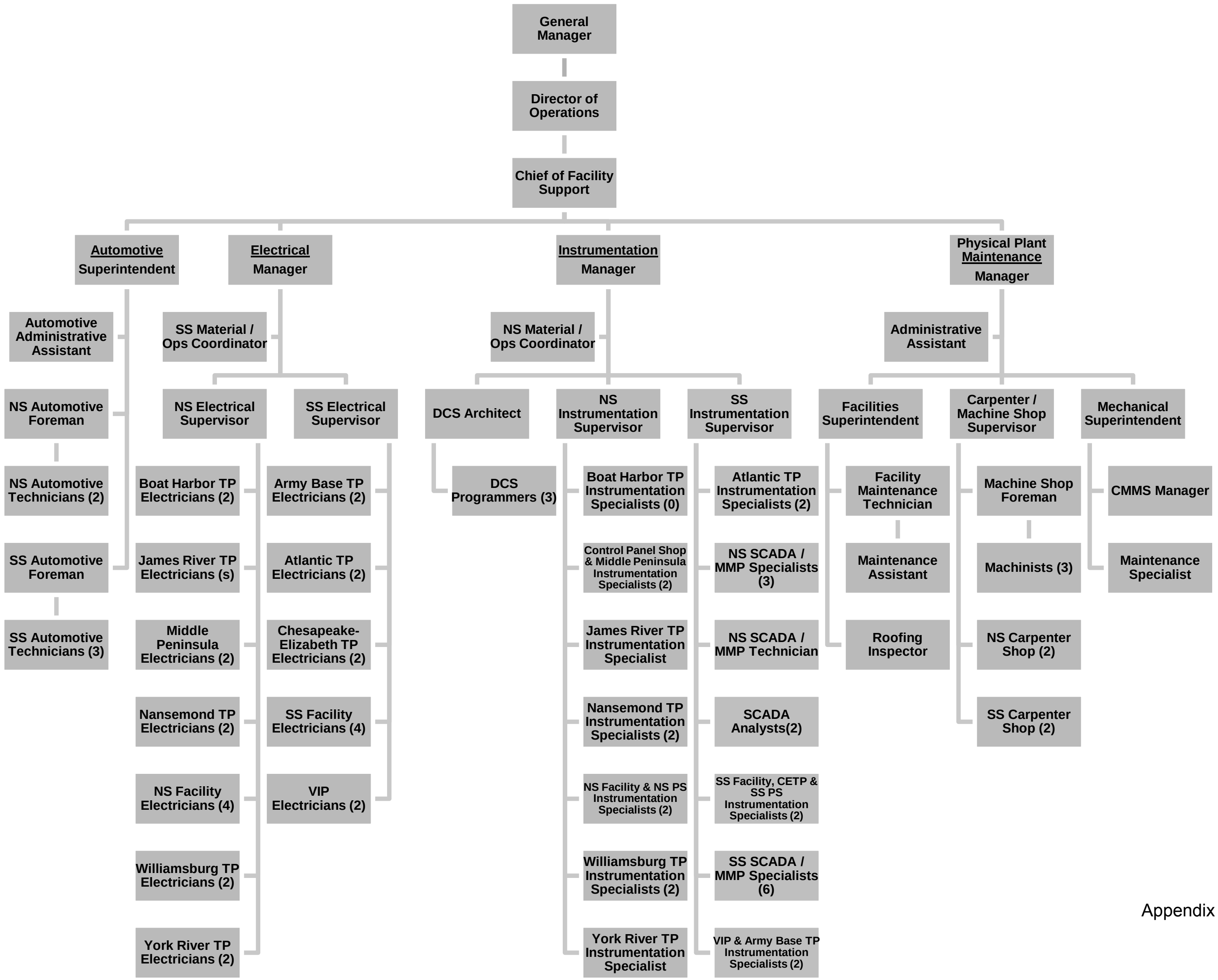
July 1, 2009



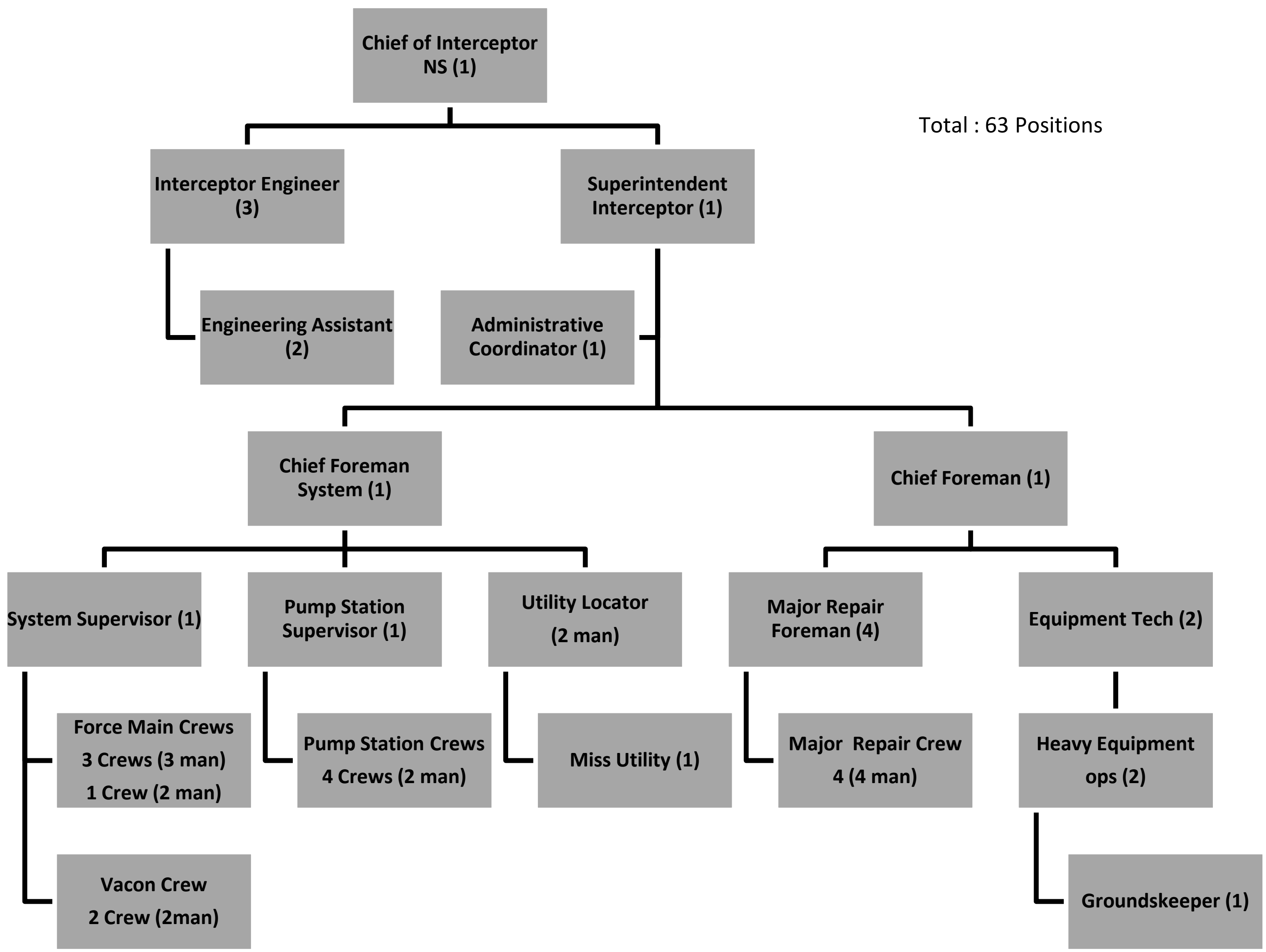
HRSD MOM Program

HRSD – OPERATIONS (FACILITY SUPPORT) ORGANIZATION CHART

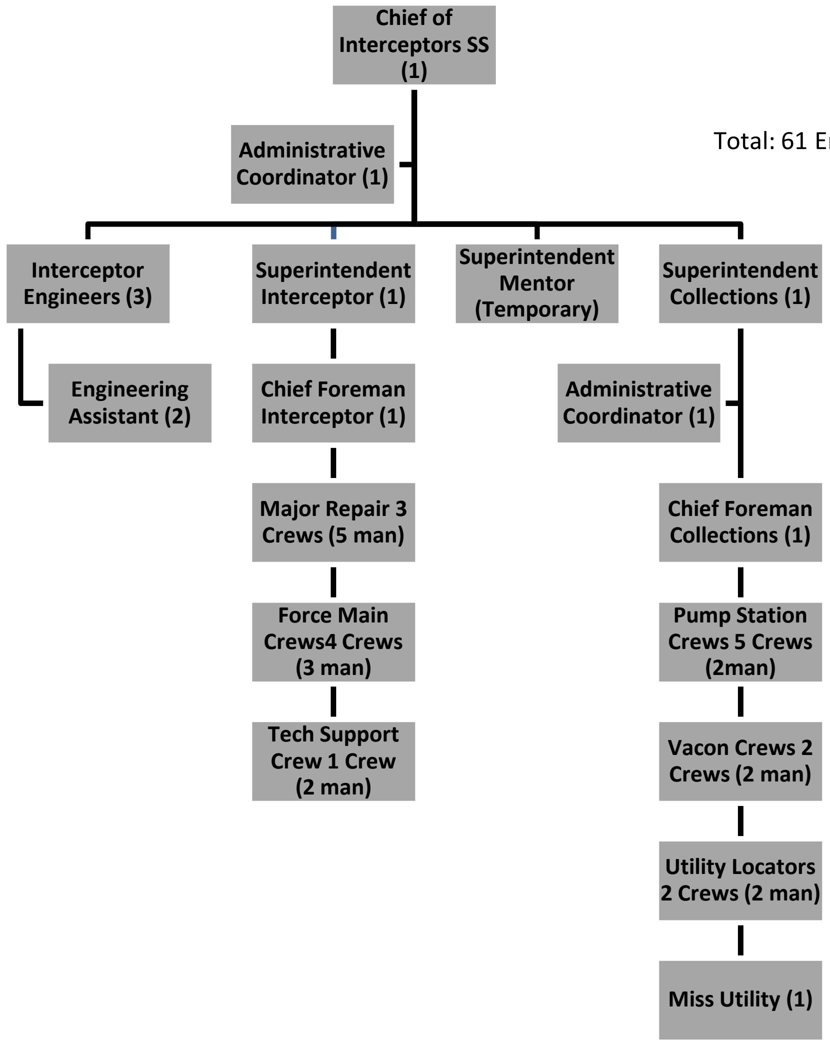
July 1, 2009



NS Interceptor 2010 Staffing



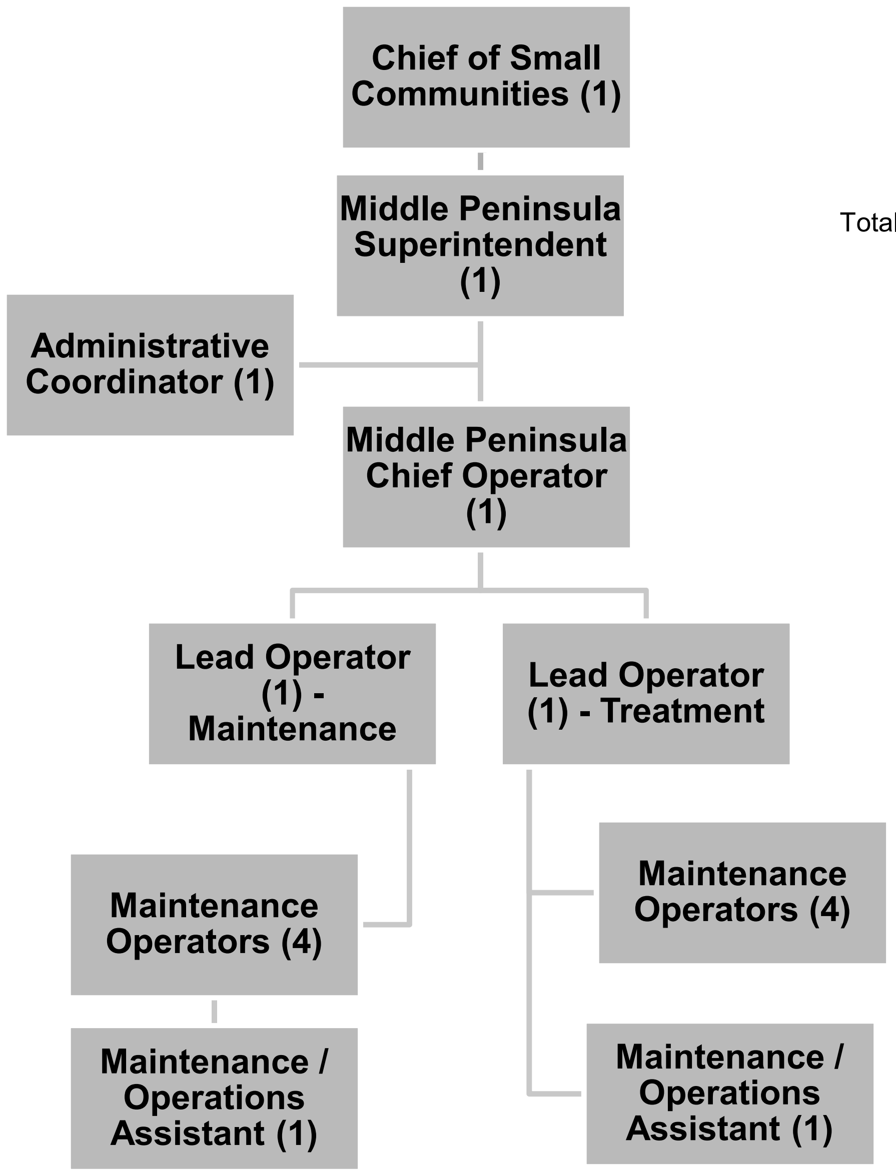
South Shore Interceptor 2010



Total: 61 Employees

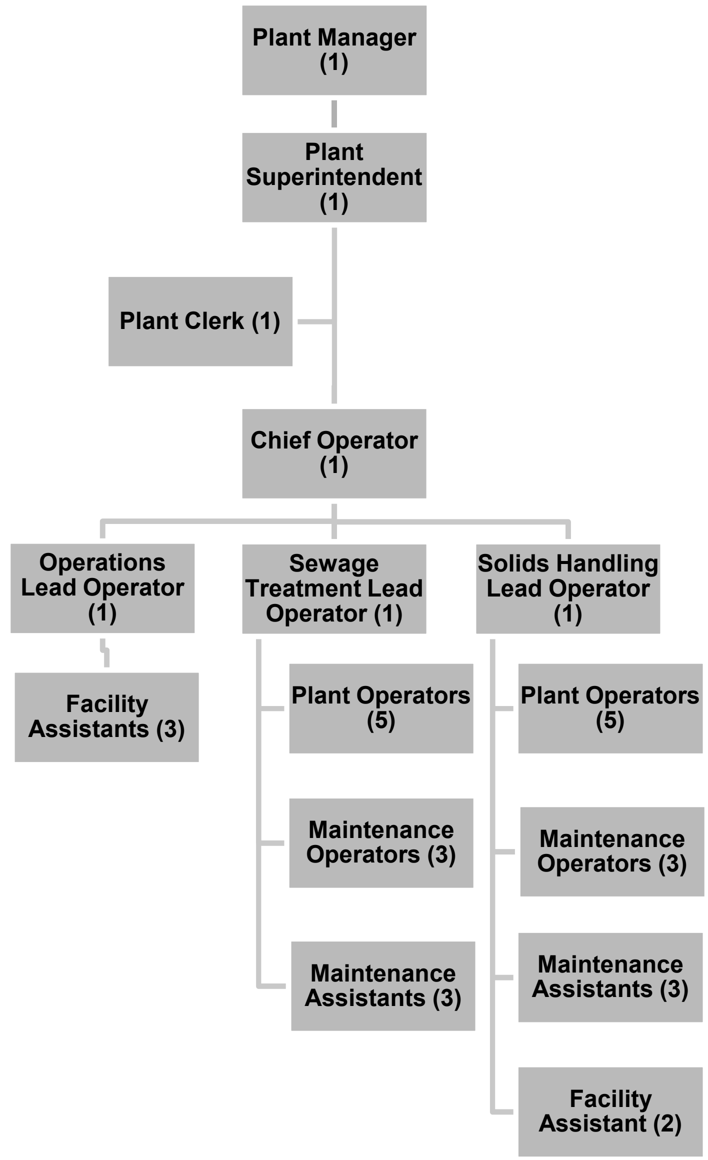
HRSD – OPERATIONS (SMALL COMMUNITIES)
ORGANIZATION CHART

July 1, 2009



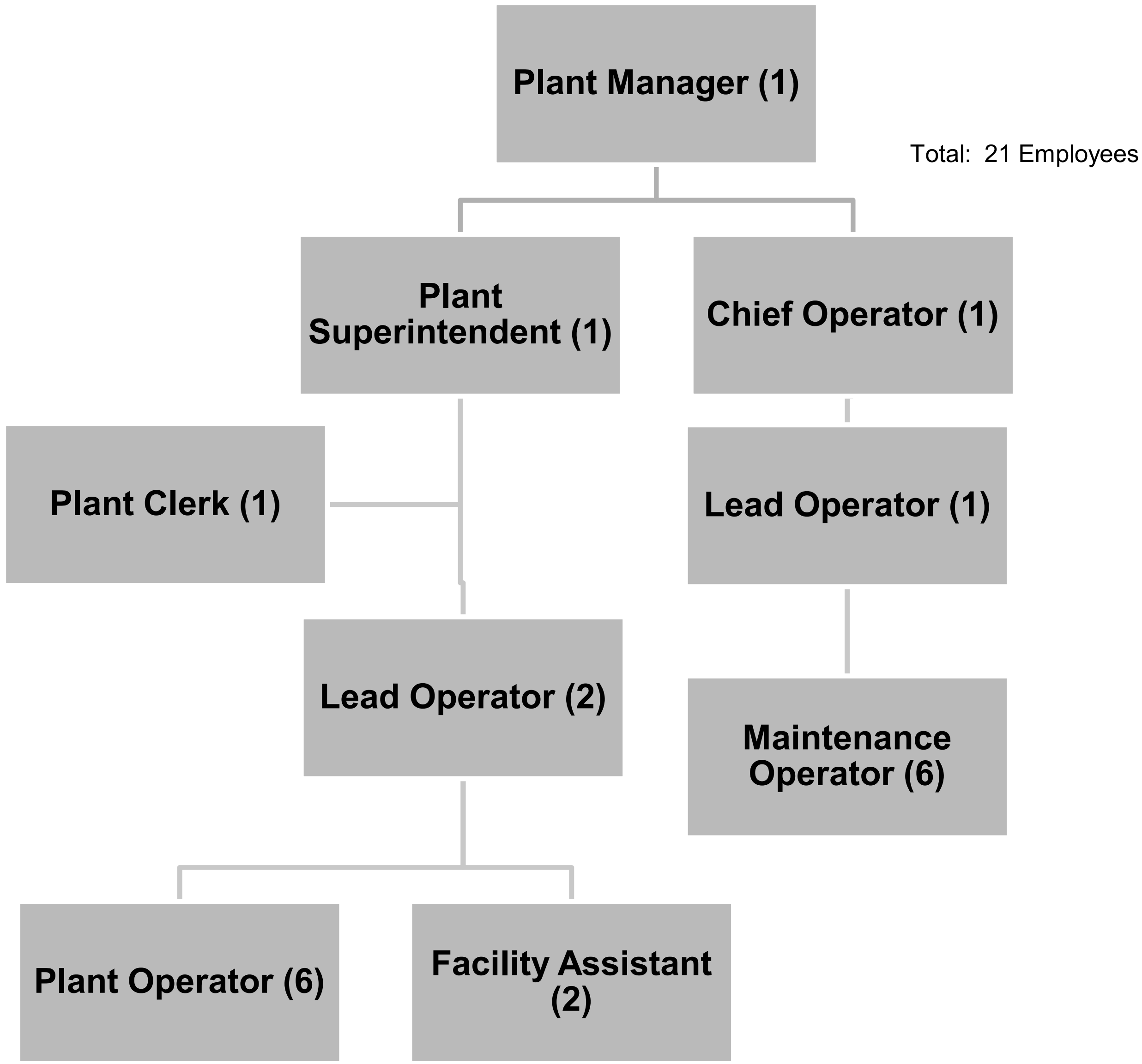
Total: 16 Employees

HRSD – OPERATIONS (BOAT HARBOR TP)
ORGANIZATION CHART
July 1, 2009



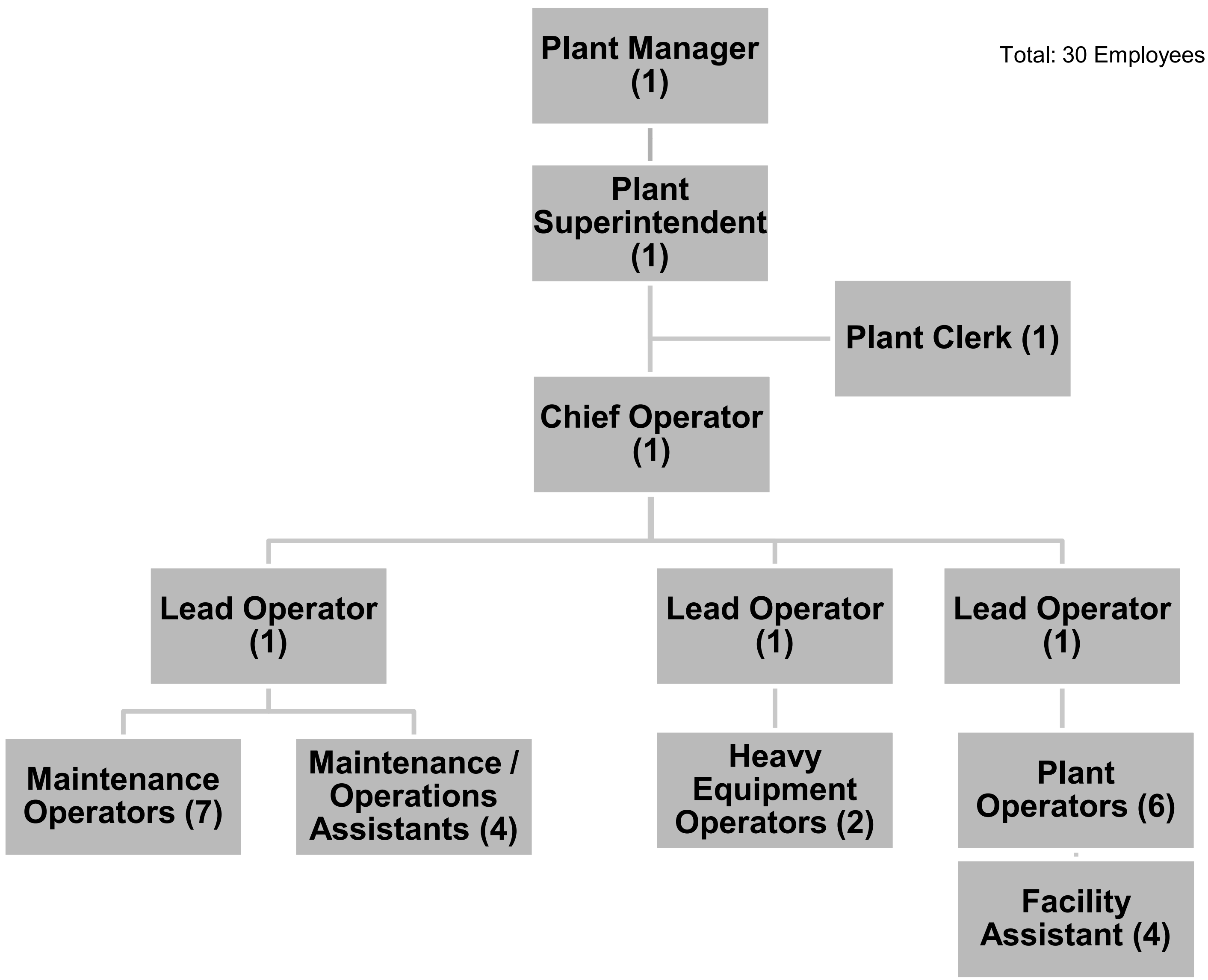
Total: 34 Employees

HRSD – OPERATIONS (JAMES RIVER TP)
ORGANIZATION CHART
July 1, 2009

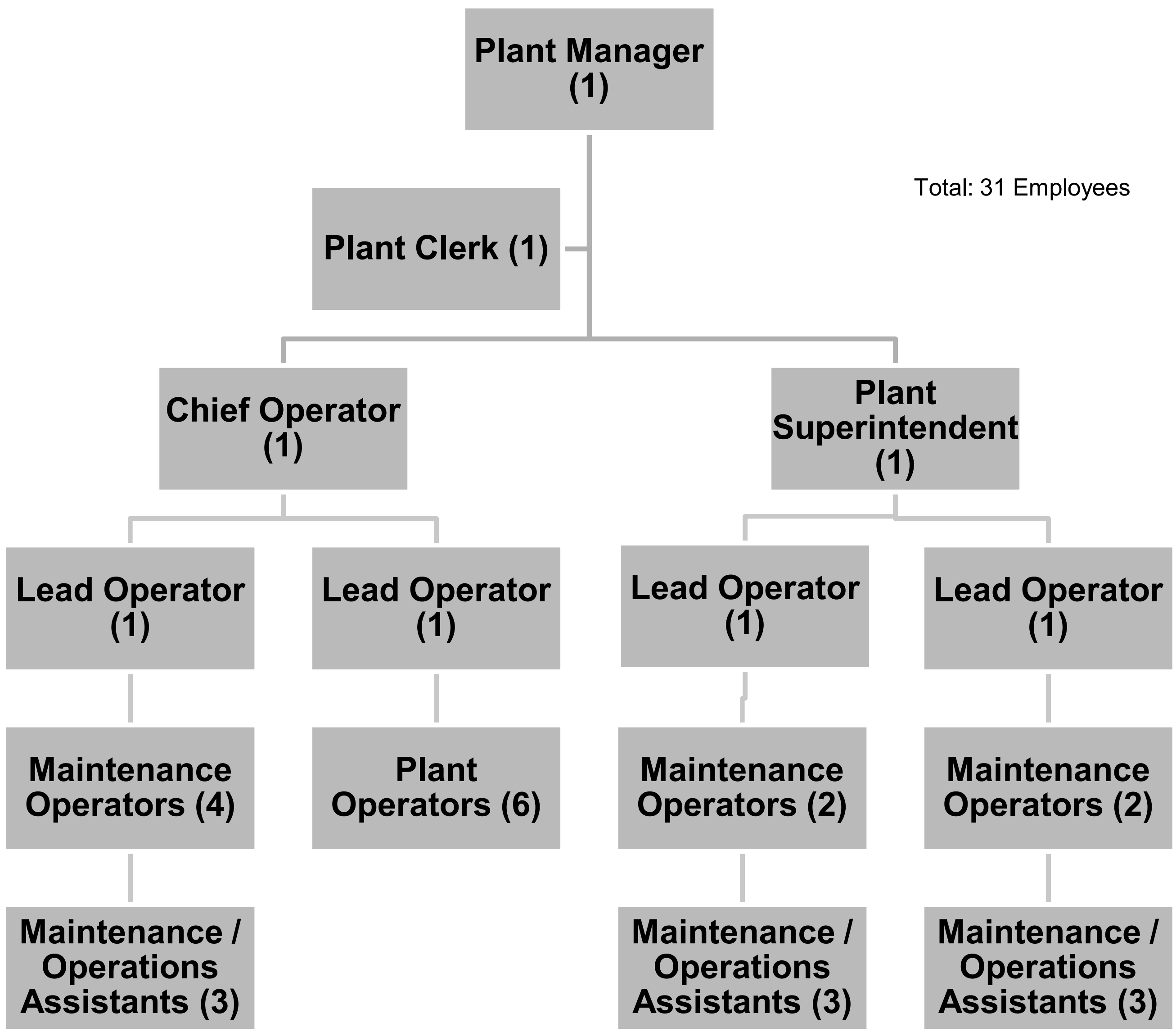


HRSD – OPERATIONS (NANSEMOND TP) ORGANIZATION CHART

July 1, 2009

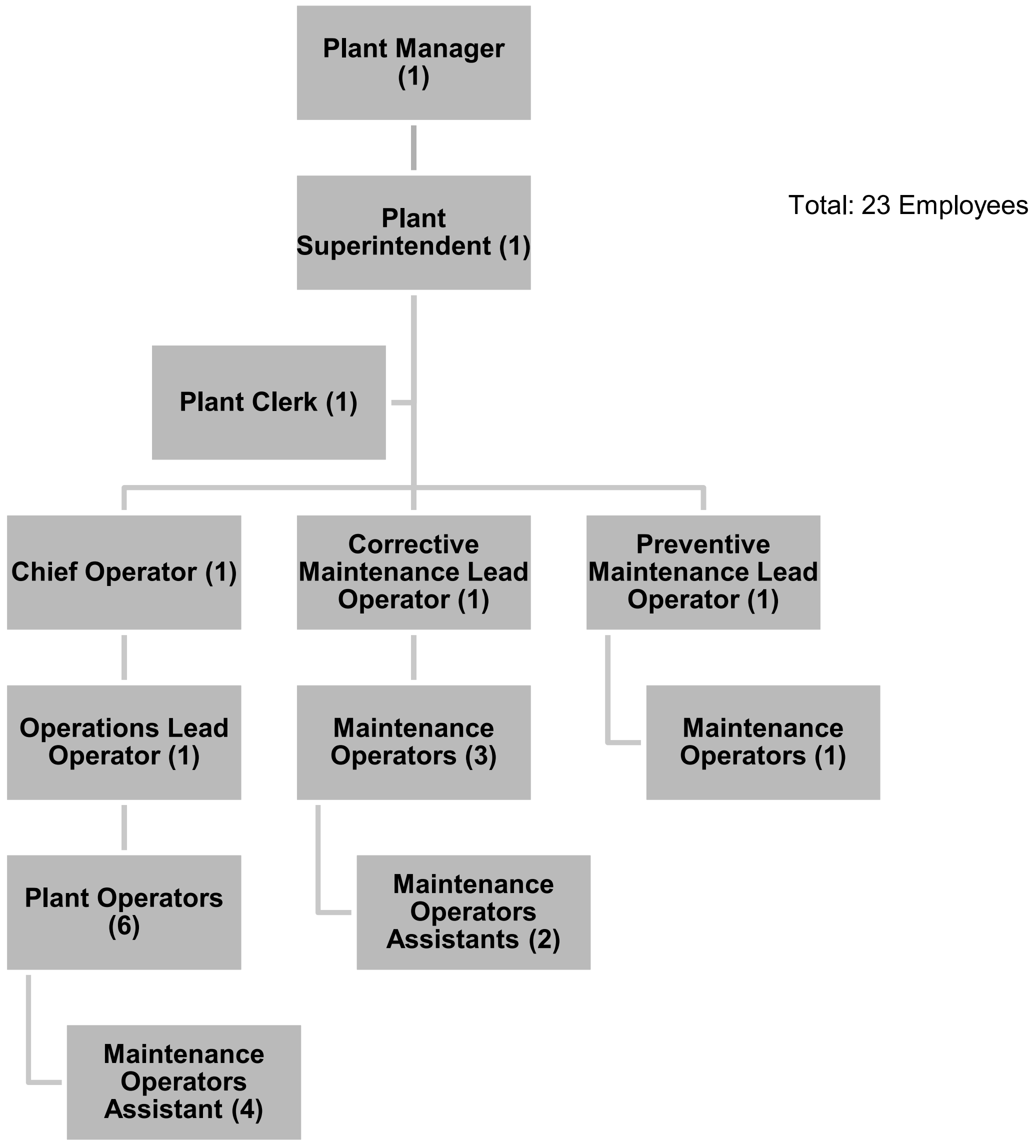


HRSD – OPERATIONS (WILLIAMSBURG TP)
ORGANIZATION CHART
July 1, 2009

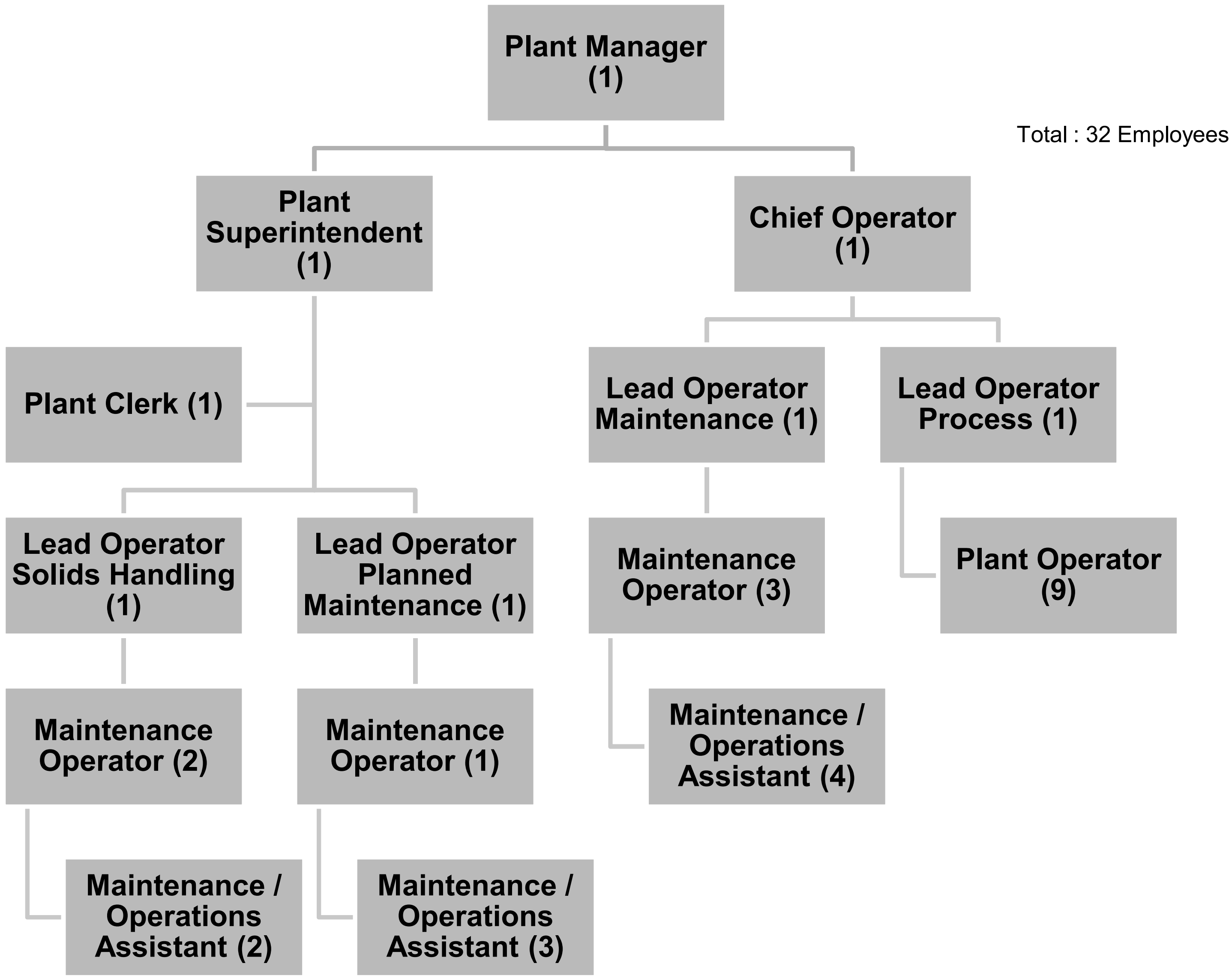


HRSD – OPERATIONS (YORK RIVER TP) ORGANIZATION CHART

July 1, 2009



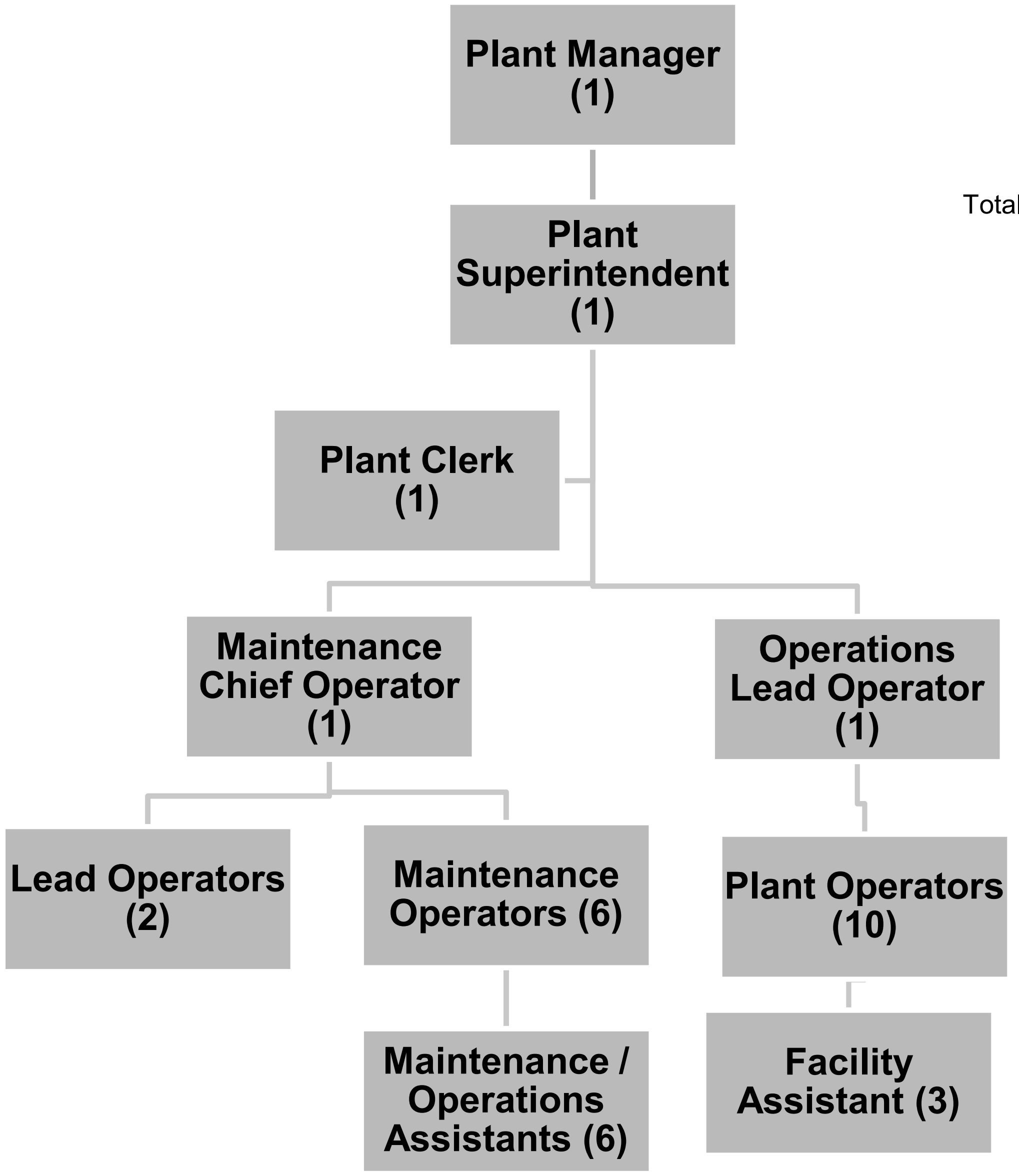
HRSD – OPERATIONS (ARMY BASE TP)
ORGANIZATION CHART
July 1, 2009



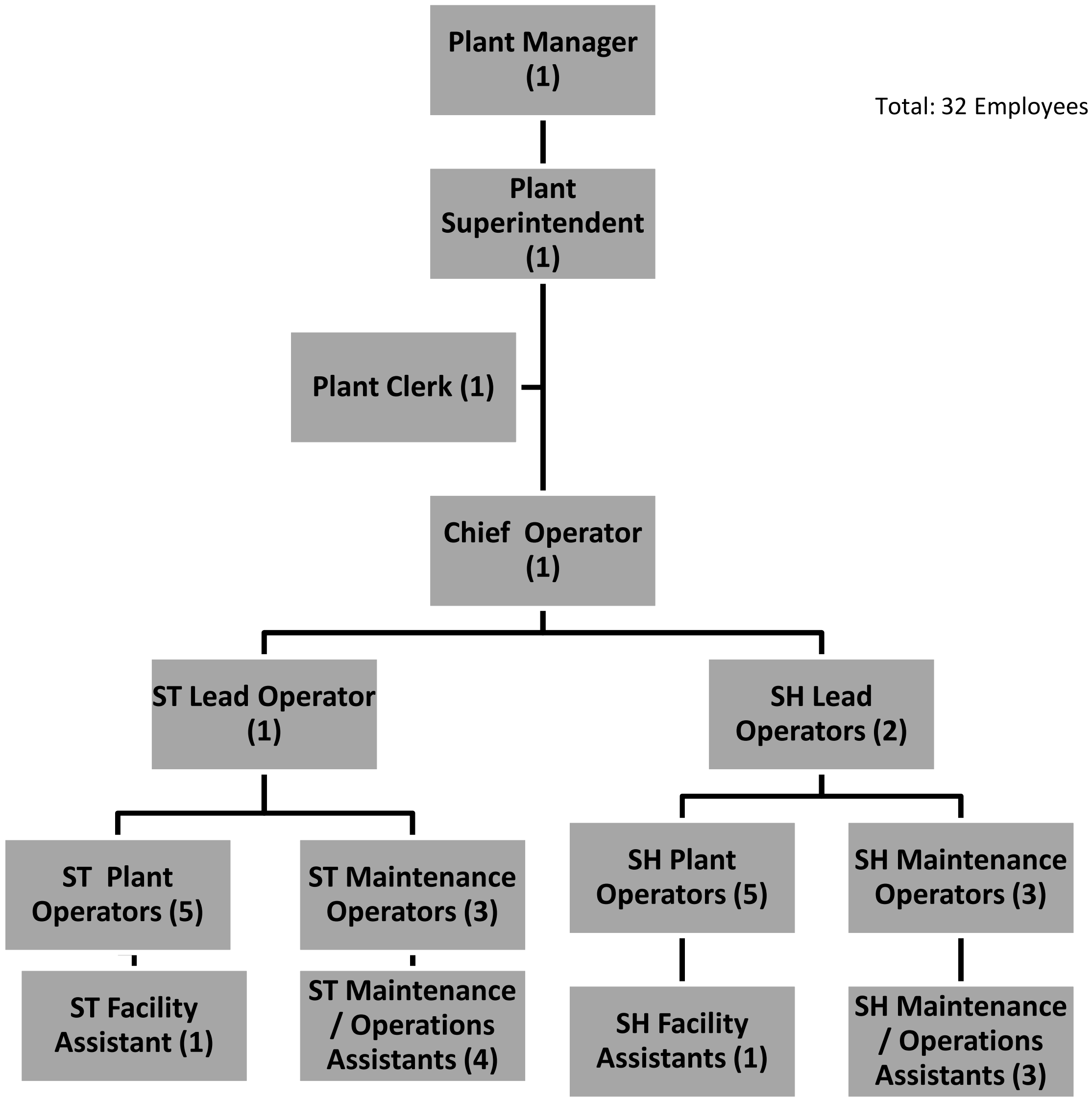
HRSD – OPERATIONS (ATLANTIC TP) ORGANIZATION CHART

July 1, 2009

Total:32 Employees



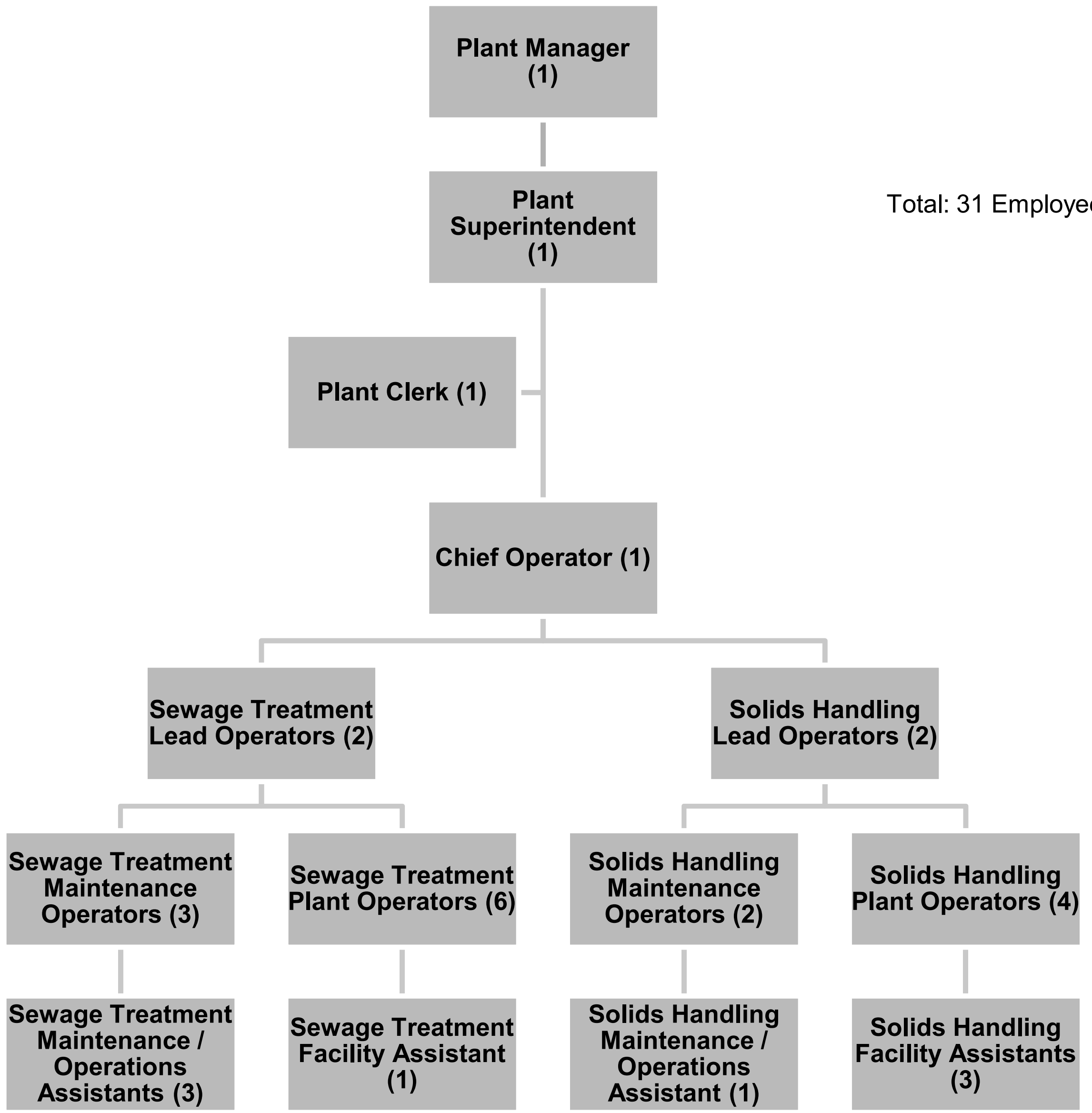
Chesapeake Elizabeth Plant
2010 Organizational Chart



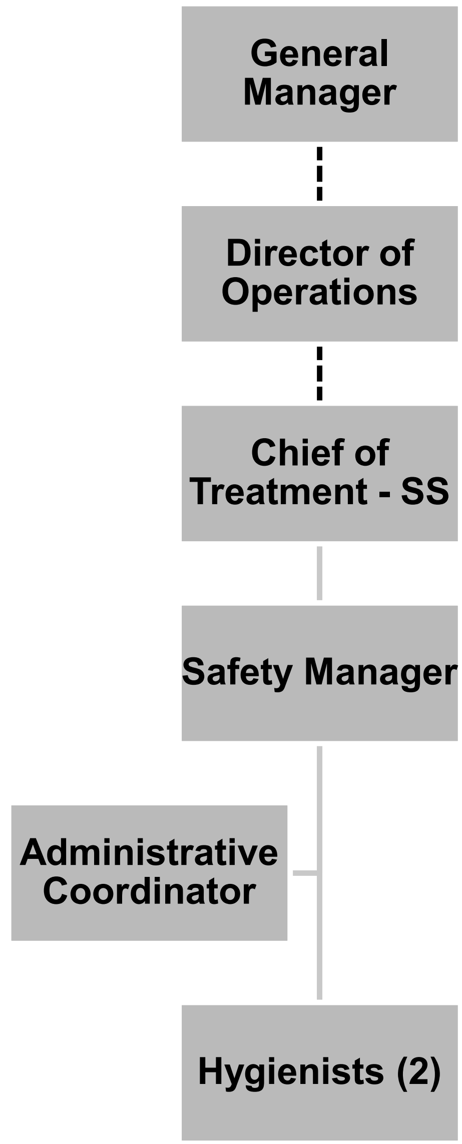
HRSD – OPERATIONS (VIRGINIA INITIATIVE PLANT) ORGANIZATION CHART

July 1, 2009

Total: 31 Employees



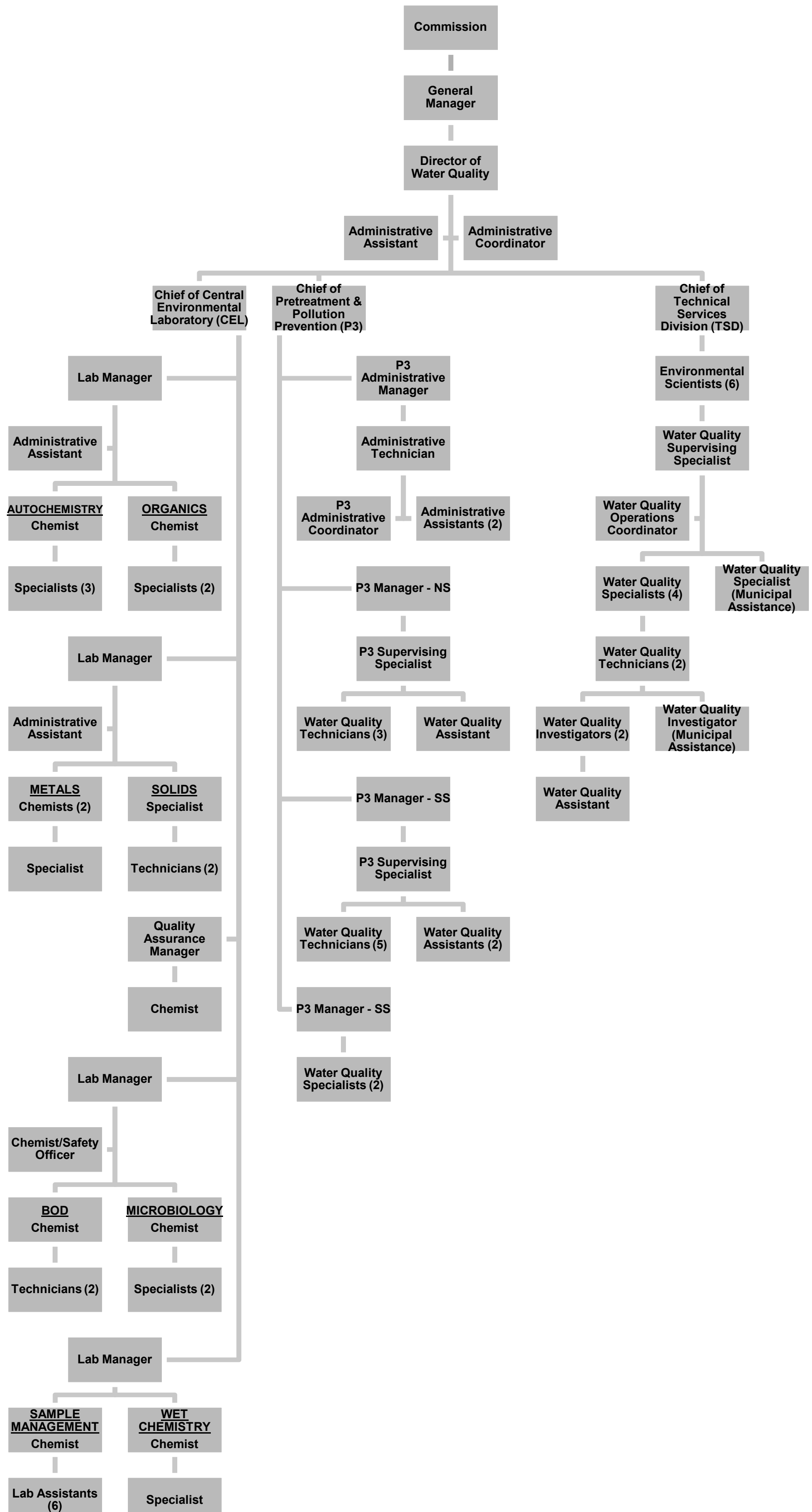
HRSD – OPERATIONS (SAFETY)
ORGANIZATION CHART
July 1, 2009



Total: 4 Employees

HRSD – WATER QUALITY ORGANIZATION CHART

July 1, 2009



APPENDIX B – INTERCEPTORS CREW ASSIGNMENT MATRICES

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NORTH SHORE - PERSONNEL ASSIGNED TO CRITICAL MAINTENANCE ELEMENTS OF MOM PROGRAM

Resource Information		Critical Maintenance Elements								
Crew Information	**Equipment Information**	**Pump Stations**	**Gravity Mains**	**Manholes**	**Force Mains**	**Air Release Valves**	**Pressure Control Valves**	**Main Line Isolation Valves**	**Maintenance of Way**	**I / I Investigation**
3 Repair Crews • 1 Foreman • 1 Interceptor Tech • 1 Equipment Operator • 2 Assistants	• Heavy duty truck equipped with crane, hydraulics, and repair equipment (1 per crew) • ¾ ton pickup for supervising • Access to variety of additional equipment on as needed basis (excavators, Backhoes, Tractors, etc)	• Annual PMs • Repairs	• Large scale repairs	• Large scale repairs	• Large scale repairs	• Large scale repairs	• Large scale repairs	• Large scale repairs		
1 Shops/Grounds crew • 2 Interceptor Techs • 2 Equipment Operators • 1 Groundskeeper Also perform fabrication, maintenance of portable equipment, inventory management, etc as needed	• Pick up Trucks • Various hand tools, welders, etc	• Repair crew support	• Repair crew support	• Repair crew support	• Repair crew support	• Repair crew support	• Repair crew support	• Repair crew support	• Clearing	
1 Hybrid Crew (authorized to be filled) • 1 Foreman • 1 Interceptor Tech • 1 Equipment Operator • 2 Assistants *Primary* – Support to Condition Assessment Program *Secondary* – Support to repair crews	• Heavy duty truck equipped with crane, hydraulics, and repair equipment (1 per crew) • ¾ ton pickup for supervising • Access to variety of additional equipment on as needed basis (excavators, Back-hoes, Tractors, etc)	• Backup support to repair crews	• Backup support to repair crews	• Backup support to repair crews	• Backup support to repair crews	• Backup support to repair crews	• Backup support to repair crews	• Backup support to repair crews		
3 Pump Station Crews • 1 Interceptor Tech • 1 Assistant	• ¾ Ton Truck • Various hand tools	• Light maintenance • General repair • Daily, weekly, monthly, and semi-annual PMs								
1 Chemical crew • 2 Interceptor Techs	• 5-ton flatbed truck • Portable Tanks • Chemical Pumps	• Scrubber PM • Various assistance in pump stations	• Injector systems		• Injector systems					
2 Flusher Support Crews • 2 Equipment Operators	• Vacuum Truck (1 per crew)	• Wet well cleaning	• Cleaning • Repair crew support	• Repair crew support	• Repair crew support	• Repair crew support	• Repair crew support	• Repair crew support		

Resource Information		Critical Maintenance Elements								
Crew Information	Equipment Information	Pump Stations	Gravity Mains	Manholes	Force Mains	Air Release Valves	Pressure Control Valves	Main Line Isolation Valves	Maintenance of Way	I / I Investigation
3 Interceptor Crews • 1 Interceptor Tech • 2 Assistants	• Crew crab truck equipped with hydraulics and tools for ARVs, etc		• Support on repairs	• Support repairs	• Vault inspections • Support on repairs	• PMs • Exercise • Repairs	• PMs • Exercise	• PMs • Exercise		
1 Reliability Crew • 2 interceptor techs	• CCTV Truck • Meter van for temporary flow and pressure metering		• CCTV	• CCTV						• CCTV • Flow Metering
1 Locator Crew • Interceptor Tech • Locator • Miss Utility Clerk	• Locating equipment • Vehicle									

SOUTH SHORE - PERSONNEL ASSIGNED TO CRITICAL MAINTENANCE ELEMENTS OF MOM PROGRAM

Resource Information		Critical Maintenance Elements								
Crew Information	**Equipment Information**	**Pump Stations**	**Gravity Mains**	**Manholes**	**Force Mains**	**Air Release Valves**	**Pressure Control Valves**	**Main Line Isolation Valves**	**Maintenance of Way**	**I / I Investigation**
Inventory/Field Support Crew • Equipment Technician • Heavy Equipment Operator	• Pickup truck	• Support	• Support	• Support	• Support	• Support				
3 Maintenance Crews • Foreman • Technician • 2 Heavy Equipment Operators • Assistant	• 6 person, 4 door truck with utility bed • Pooled equipment for backhoe, dump truck, etc	• Emergency Repairs • Annual PMs	• Emergency Repairs	• Emergency Repairs	• Emergency Repairs	• Emergency Repairs				
3 Interceptor Crews • Technician • Heavy Equipment Operator • Assistant **Additional Responsibility**: Traffic control	• 6 person, 4 door truck with Utility bed • Crash truck (future) – currently shared crash truck		• Operations • PMs Repairs	• Operations • PMs Repairs	• Operations • PMs Repairs	• Operations • PMs Repairs	• Annual PM Routine Maintenance	Annual PM	• Maintenance and Clearing	
1 Interceptor Crew • Technician • Heavy Equipment Operator • Assistant **Primary Focus:** Consent Order - Condition Assessment Support **Additional Responsibility:** • Traffic control GPS upkeep	• 2 person utility pickup					• Adjust castings	• Adjust castings		• Maintenance and Clearning • May outsource this in future	• Flow metering
5 Pump Station Crews • Technician • Assistant	• Pump Station Route Vehicle	• Operations • Daily, Weekly, Monthly PMs • Annual Small Station PMs • Routine Maintenance								
2 Vacon Crews • Technician • Heavy Equipment Operator	• Vacon Trucks		• Cleaning • Repair crew support	• Repair crew support	• Repair crew support	• Repair crew support	• Repair crew support	• Repair crew support		
2 Locator Crew • 1 Miss Utility Clerk (1 to support 2 crews • Technician • Assistant	• Locating equipment									

APPENDIX C – PORTABLE PUMP DEPLOYMENT

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Appendix C. Emergency Portable Pumps			
Operations	**Location ***	**Quantity**	**Size**
North Shore	Washington Street	1	6"
North Shore	Center Ave PS	1	8"
North Shore	James River TP	1	8"
North Shore	Langley Circle PS	1	12"
North Shore	Willard Ave PS	1	12"
North Shore	Victoria Blvd PS	1	12"
North Shore	James River TP	1	12"
North Shore	Portable	2	4"
North Shore	Portable	4	6"
North Shore	Portable	1	8"
North Shore	Portable	1	12"
South Shore	City Park PS	1	6"
South Shore	Seay Ave PS	1	6"
South Shore	Colley Ave PS	1	6"
South Shore	Monroe PS	1	6"
South Shore	Ashland Cir PS	1	6"
South Shore	Dozier's Corner PS	1	6"
South Shore	Richmond Crescent PS	1	6"
South Shore	Park Ave PS	1	8"
South Shore	Luxembourg PS	1	8"
South Shore	Norchester PS	1	8"
South Shore	Rodman Ave PS	1	12"
South Shore	Suffolk PS	1	12"
South Shore	Chesapeake Blvd PS	1	12"
South Shore	Arctic Ave	1	12"
South Shore	Portable	3	4"
South Shore	Portable	5	6"
South Shore	Portable	2	8"
South Shore	Portable	4	12"

*Deployment as of June 2011. Changes will be made as needs dictate.

APPENDIX D – SANITARY SEWER OVERFLOW RESPONSE PLAN (SSO RP)

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SANITARY SEWER OVERFLOW RESPONSE PLAN (SSO RP)

Prepared for the
Hampton Roads Sanitation District

Revision Date: September 24, 2010
Version Number: 3.1

Previous Versions:

1.0	Nov 2007
2.0	Jul 2009
3.0	Jun 2010

HRSD
Cleaning wastewater every day for a better Bay.

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TABLE OF CONTENTS

1. INTRODUCTION

The Hampton Roads Sanitation District (HRSD) is a regional wastewater service provider in southeast Virginia serving a geographic area of 3,100 square miles and a population of approximately 1.6 million people. It owns and operates approximately 430 miles of pressure sewer mains (and associated valves and appurtenances), approximately 50 miles of gravity sewer mains (and associated manholes, siphons, and vaults), and 81 pumping facilities which include 65 wet well pumping stations and 16 pressure reducing stations. The HRSD sanitary sewer system takes pumped flow and gravity flow from surrounding communities and transports the flows to its thirteen sewage treatment plants (STPs) with a combined treatment capacity of up to 231 million gallons of wastewater per day. Each of the cities, towns, and counties in HRSD's service area (Localities) collects wastewater in their own sanitary sewer collection systems and sends it to HRSD's Interceptor System for conveyance to the wastewater treatment plants.

As with any sanitary sewer system, events occur that sometimes lead to the release of wastewater from the collection system. This plan provides the details on HRSD's protocol for responding to each event, tracking and documenting them, as well as providing for a resolution to minimize future occurrences.

1.1 General

This Sanitary Sewer Overflow Response Plan (SSO RP) was developed to reduce or prevent environmental and public health impacts of all collection system releases. It provides structured guidance for release response, including a range of appropriate and effective field activities that HRSD response teams can choose from to meet the needs of each situation. HRSD response officials will use their discretion and best professional judgment to evaluate each event and choose the appropriate minimization/remediation approach and tools. The procedures established in this document are guidance for HRSD to address SSOs and are not considered as the only approach to SSO response, as long as regulatory obligations are met.

1.2 SSO Terminology

Definitions in terminology vary across cities, states or regions of the country for the name of the event where wastewater is released from a collection system. The Commonwealth of Virginia, and the Special Order by Consent to which HRSD is a party, indicates that a sanitary sewer overflow (SSO) occurs when a release of wastewater reaches or may reasonably be expected to reach waters of the United States or the Commonwealth of Virginia. This is an event that is reported to the appropriate regulatory agencies and departments, including the Virginia Department of Environmental Quality and the various local health departments.

HRSD is also party to an Amended Consent Decree (effective February 23, 2010) with the Federal and State government that includes two definitions:

- Sanitary Sewer Overflow (SSO) – an overflow, spill, diversion, or release of wastewater from or caused by the Regional Sanitary Sewer (SS) System. This term shall include: (i) discharges to waters of the State or United States from the Regional SS System and (ii) any release of wastewater from the

Regional SS System to public or private property that does not reach waters of the United States or the State, including Building/Private Property Backups.

- Sanitary Sewer Discharge (SSD) – any discharge to waters of the State or the United States from the HRSD SS System through a point source not authorized by any Permit.

Comparing the two definitions for SSO from the Commonwealth of Virginia and the Consent Decree, there is a difference to be noted. According to the State Water Control Law, only discharges that reach or may be reasonably expected to reach Federal or State waters are reportable SSOs, while the Consent Decree broadens the definition of SSO to include all discharges.

The definition of SSO contained in the Consent Decree uses the term "Regional SS System" which includes Localities' systems. Except for limited coordination and notification provisions specifically outlined in this document, where SSO is used in the remainder of the term shall refer to SSO's from the HRSD SS System.

HRSD will use the terminology such that any release of wastewater from the sanitary sewer system will be considered an SSO, but will divide the group into "reportable" and "non-reportable" discharges. All SSOs will be tracked as described in this document, but only those reaching or that may be reasonably expected to reach Federal or State waters will be reported as required. HRSD does not consider a minor contained release of wastewater during a planned maintenance activity (such as wastewater collected in a bucket during air release valve maintenance) as an SSO requiring documentation. HRSD's Permits Manager from the Water Quality Division, in consultation with Interceptor Systems staff, is responsible for the decision whether an SSO is reportable.

In addition, this plan is intended to cover wastewater releases from the collection system upstream of the various treatment plant headworks. Any release, discharge, bypass, or plant upset from the treatment plant headworks through the treatment plant outfall is regulated by the Virginia Pollutant Discharge Elimination System (VPDES) permit in place at each facility. These permits have specific requirements for monitoring and reporting this type of event to the appropriate regulatory authorities, and HRSD complies with these rules.

1.3 SSO Response Plan Overview

The SSO RP implements the following responsive guiding principles:

1. All SSOs are responded to and halted as rapidly as possible;
2. To the maximum extent practicable, prevent or minimize impacts to the public and environment;
3. Implement corrective actions to prevent and/or minimize any recurrence; and
4. Document and track all SSOs for regulatory reporting and system operation purposes.

Responsibility for the procedures of this workflow process is divided among various divisions and groups within HRSD. The HRSD staff involved includes Interceptor Operations, Engineering's Planning and Analysis, and Water Quality. It is expected that at each hand-off point between divisions or sections, both parties will take responsibility until the hand-off is clearly understood. HRSD uses data management tools and tracking methods to facilitate the management of these hand-offs. HRSD Directors will be responsible for ensuring compliance with these procedures by their staff.

Where outside agencies or organizations are identified (e.g., VDEQ or Localities), those organizations should provide the required information or perform the described tasks.

The following sections provide an outline of the SSO RP, and the actions HRSD will take to reduce any impacts of SSOs. A more detailed Standard Operating Procedure is provided in Section 2 of this Plan.

1.3.1 Receipt of Information

HRSD's investigation of an SSO begins when a customer, HRSD employee, internal automated system, or outside party reports a possible SSO. To ensure that HRSD is made aware of each SSO as expeditiously as possible, there are several methods by which SSOs are reported. One common source of notification comes from individuals who witness the event and contact HRSD's Operations Coordinator, who in turn notifies the appropriate supervisor. HRSD employees/field crews, municipal employees, or other agencies may also report SSOs to HRSD. The Supervisory Control and Data Acquisition System (SCADA) and other HRSD remote telemetry systems can provide alerts that an investigation is warranted.

1.3.2 Field Staff Response

Once notified, HRSD will make all reasonable efforts to respond quickly to SSOs with a highly qualified first responder. The first responder is responsible for confirming that there is an SSO and notifying the appropriate supervisor, locality, or the private owner, as appropriate. Differing approaches are required for response during business and non-business hours, as detailed in Section 2.

1.3.3 SSO Containment, Repair, and Cleanup

Assess the Impacted Area – An assessment of the nature of the area of the SSO will be performed to determine a potential for impact on the public and/or the environment. The sensitivity of an SSO location will affect the level of public notification. These sensitive issues may include the proximity of the SSO location to:

1. Streams, reservoirs, wetlands, and other natural waterways;
2. Public use areas – both water based such as marinas as well as land-based;
3. Special facilities to include schools, public parks, walking trails, etc.; and
4. Other potential factors such as particularly sensitive aquatic community, water intakes, etc.

Establish Control Zone - Control zones are established to help prevent public access around the perimeter of the affected surface area by using appropriate signs, barricading practices, or other measures.

Assess the Cause – Once an SSO is confirmed, interceptor personnel will determine how the SSO can be contained or controlled to minimize the amount of flow discharged. The cause will determine the type of mitigation or remediation that is most appropriate.

Identify Resources and Techniques Required – HRSD will use all necessary response procedures and implement essential methods so that the goals of the SSO RP are met.

The following resources are available as needed, but are not inclusive or limiting:

- Highly skilled and trained personnel
- Excavation equipment
- Pump and haul equipment
- Closed-circuit television equipment

- By-pass pumping equipment
- Repair parts and materials
- Other material, such as sand bags, silt fences, signs, disinfectant, etc.

Contain and Control SSO – Once the cause of a release has been identified and techniques implemented to stop the flow, a recovery/cleanup plan will be implemented in a timely manner.

Mitigation/Remediation Solutions - Common abatement resolution activities and repairs will be used independently or combined based on field conditions and any other relevant considerations.

SSO Clean Up – HRSD will clean up impacted areas from an SSO in a comprehensive manner.

1.3.4 Documentation

Using data collected during the assessment process, HRSD will prepare an initial and updated Interceptor System Regulatory Reporting Form (RRF). The Regulatory Reporting Form is the main tool that is used for initially documenting an SSO. The information used to populate the SSO Database and SSORS is drawn from the RRF. After HRSD staff confirms that an event is an SSO and they contact Water Quality for regulatory reporting, an RRF is initiated with the available information. This form is typically reviewed by the appropriate Interceptor Systems Chief (North Shore or South Shore) prior to final documentation.

Water Quality staff will review the RRF in conjunction with notes from telephone reports with the response crew in preparation for regulatory reporting. The collection of necessary information by the first responder as described in previous sections is crucial to provide accurate reporting.

1.3.5 Regulatory Reporting

In the event that an SSO from the HRSD SS System is determined to be reportable, HRSD will provide an initial notice to the Virginia Department of Environmental Quality (VDEQ) as soon as possible but no more than 24 hours of receipt of information regarding an SSO. A final report is required within five days utilizing the Sanitary Sewer Overflow Reporting System (SSORS).

Information on SSORS is provided in detail in Appendix B. This database is maintained by the Hampton Roads Planning District Commission (HRPDC) and used for regulatory reporting of SSOs to the VDEQ.

SSORS has an SSO Cause List for each event that is useful for sorting SSOs that are caused by operational issues versus third party issues or capacity issues. The following section provides a summary description of each category:

Capacity, non weather – overflow caused by lack of available capacity in the pipe, pump station or downstream infrastructure. There should be no rain either before or during the event and no other cause apparent. The flow in the infrastructure exceeds its capacity. This requires an engineering calculation. This cause should not be used for infrastructure failure.

Capacity, weather related – overflow caused by a lack of available capacity in the pipe, pump station or downstream infrastructure caused by rainfall and/or high tides and flooding. It is critical to note the circumstances surrounding this type of event (i.e., rainfall amount, surface flooding, etc.)

Infrastructure - overflow caused by equipment and/or pipe failure. This would include pump/motor failure in pump stations, pipe collapses, etc. Overflows caused by maintenance related circumstances (see below) should not be reported in this group. Identifying these causes sometimes requires internal inspection.

<u>Maintenance (maintenance-grease; maintenance-roots; maintenance-debris)</u> – overflow caused by maintenance related issue including grease, roots and/or debris build up. Identifying these causes sometimes requires internal inspection.

<u>Power Loss</u> – overflow caused by loss of grid power not related to storm conditions including third party actions and failure of grid power in non storm conditions.

<u>Power Loss, storm</u> – overflow caused by a loss of grid power or lightning strikes to facilities directly attributable to a storm.

<u>Damage by others</u> – overflow caused by third parties including boring/excavation contractor hits and vandalism. Information should be referenced regarding the nature of the damage and measures taken prior (i.e., utility locate activities, locks, fences, etc.) to prevent the damage.

<u>Other</u> – overflows caused by circumstances not fitting one of the above. This cause should be used rarely.

SSORS generates a unique event ID number that is tracked on the RRF and in the SSO Database.

This section assumes that the first responder has confirmed that an SSO has occurred and that the regulatory notification procedure is required. Section 2 describes the procedures for handling first communications of a possible SSO and subsequent procedures for the appropriate response.

Reporting procedures differ depending on whether the event takes place during normal business hours (7:00 am to 3:30 pm Monday through Friday) or during non-business hours.

1.3.6 SSO Tracking

SSOs will be tracked and documented for regulatory reporting and system operation and planning purposes. HRSD maintains a database of documented SSO events that is used for storing additional information on SSO resolution beyond the basic information recorded on the RRF or SSORS. SSO occurrences are also tracked and documented in the HRSD Geographic Information System (GIS), with links to details in the SSO Database. This is useful in determining situations where problems are recurring, with priority given for additional maintenance or condition assessment to be conducted.

The SSO Database is compared to HRSD's SSORS information on a regular basis to provide data consistency between the two data storage systems. The SSO Database is also used for verifying that each SSO is resolved by the use of system reports identifying incomplete documentation.

1.3.7 SSO Resolution

Resolution of an SSO involves a multi-step process to evaluate the incident and determine what follow-up actions are necessary. A business process workflow diagram is provided at the end of Section 2 of this Plan that details the HRSD approach to SSO response, tracking and resolution.

The following materials may be utilized in the resolution of SSOs:

- Regulatory Reporting Forms (RRFs) completed by Interceptor Systems staff;
- SSO Database;
- SSORS database (See Appendix B);
- Non-HRSD System Reporting Form;

- Flow, Pressure, and Rainfall data;
- GIS;
- Closed-circuit television (CCTV) information and other system information records;
- Capital Improvements Program (CIP) project list; and
- Rehabilitation projects list.

SSO resolution can take many different forms. Some SSOs may be evaluated and found to be one-time events with little chance of recurrence, while others may be found to be recurring capacity related SSOs that require a CIP project to address. HRSD will coordinate between its Operations and Engineering Divisions to evaluate the SSOs and determine what action should be taken. This output of this process is Action Plans with specific schedules that are tracked using data management tools to ensure completion. This process is explained in detail in Section 2.

1.4 Locality System SSOs

In some instances, an SSO occurs in a Localities' sanitary sewer system that is attributable to failures or problems in the HRSD SS System, including but not limited to force main failures, pump station outages or failures, or pressure reducing station outages or failures. These events are rare and HRSD will notify affected Localities prior to making changes (e.g., valve changes to divert flow) where system pressures could increase and hinder the Localities' ability to discharge to the system. In the event that an unforeseen situation occurs that creates an SSO in a Locality's system, HRSD will offer assistance to alleviate and mitigate the SSO in the form of pump and haul operations, installation of bypass pumps, and coordinating with the Locality to reroute flow.

1.5 Private Property

Events causing backups into buildings or discharges into a private building, require additional investigations to determine if the problem relates to an issue in the HRSD system, the Locality's system, or are the result of failure on the private customer's side. Very few private connections tie directly to the HRSD system. To determine responsibility for a backup, the first responder typically identifies the cause of the backup in conjunction with the Locality.

If the first responder inspects the HRSD system, and if no evidence of a problem is found, HRSD will advise the Locality to investigate its system or the customer to contact a plumber to resolve the disruption on private property.

If HRSD's system failure contributes to the backup, then HRSD will work with the Locality or private property owner to coordinate cleanup as appropriate.

1.6 Public Information

The Chief of Public Information is responsible for contacting the media, the public, or other communications outlets as needed. The Chief of Public Information will answer questions from the public and/or the media about HRSD's response to SSOs, when necessary. See Section 2.5.5 for specifics on Public Notification for SSOs.

2. STANDARD OPERATING PROCEDURES

The following Standard Operating Procedures will be followed by HRSD staff in responding to information related to a possible SSO in the HRSD service area. A workflow process diagram is included at the end of this section to help illustrate the lines of responsibility.

2.1 Receipt of Information

The first step in the process of responding to a possible SSO is becoming aware of the incident. HRSD, a locality, or the public may detect an SSO, or report suspicious circumstances (foul odors, unusual flooding, etc.) which indicate the possibility of an SSO. SOP 2.1.1, 2.1.2, or 2.1.4 should be followed depending on the way the incident is identified.

2.1.1 Business Hours Phone Call

During the day, the calls will normally come through the switchboard or customer service and will be forwarded to the appropriate Operations Coordinator (North Shore or South Shore). Proceed to SOP 2.1.3 for logging the call.

2.1.2 Non-Business Hours Phone Call

During non-business hours, calls are taken by the contract answering service. The answering service then reports any possible SSOs to the Duty Supervisor. The Duty Supervisor shall obtain all relevant information available regarding the incident and record in their log. Proceed to SOP 2.1.3 for logging the call.

2.1.3 Customer Log

The Operations Coordinator shall obtain all relevant information available regarding the incident and record it in the Customer Log. During non-business hours, the Standby Duty Personnel shall obtain all relevant information available regarding the incident and record in their log. This information should include:

a. Time and date call was received.

b. Location of problem;

c. Description of problem;

d. Caller's name, address, and phone number;

e. Observations of the caller (e.g., odor, back or front of property); and

f. Other relevant information that will enable the responding investigator and crews, if required, to quickly locate, assess and stop the SSO.

During business hours, the Operations Coordinator will inform the appropriate Supervisor of a possible SSO. The appropriate Supervisor will take appropriate action to investigate and determine the extent of the problem. Proceed to SOP 2.2 for Field Staff Response.

During non-business hours, the Duty Supervisor will take appropriate action to investigate and determine the extent of the problem. Proceed to SOP 2.2 for Field Staff Response.

2.1.4 Detection by HRSD

Possible SSOs detected by any personnel in the course of their normal duties shall be reported immediately to the appropriate Supervisor or the Operations Coordinator (North Shore or South Shore). If the Operations Coordinator is contacted, they will contact the appropriate Supervisor to dispatch HRSD personnel. Proceed to SOP 2.2 for Field Staff Response.

System alarms (including pump station failures) are monitored and received by the SCADA system. During business hours, the Operations Coordinator shall notify the appropriate Supervisor of the alarm so HRSD personnel can be dispatched to the pump station location. During non-business hours, Standby Duty personnel will respond to the alarm location. Proceed to SOP 2.2 for Field Staff Response.

2.2 Field Staff Response

During business hours, the Operations Coordinator will notify the appropriate Supervisor so HRSD personnel can be dispatched to the site. During non-business hours, Standby Duty Personnel will respond to the site. In either case, the following steps should be taken:

1. Appropriate HRSD personnel shall respond to a possible SSO in a timely manner.
2. Appropriate HRSD personnel shall locate the problem and record the arrival time.
3. Appropriate HRSD personnel shall assess the situation and confirm that an SSO exists. First responders carry chlorine residual test kits to attempt to confirm whether the water being discharged is wastewater (vs. potable water). The first responder begins to determine the source and cause of the discharge.
4. If no SSO is found, the appropriate HRSD personnel shall document or notify the Operations Coordinator (North Shore or South Shore) immediately, who completes the Customer Log as a non-SSO. This ends the SOP.
5. If an SSO is found, the appropriate HRSD personnel shall make an initial assessment of jurisdiction. If the SSO appears to be discharging from a non-HRSD facility, proceed to SOP 2.2.1. If the SSO appears to be discharging from an HRSD facility, proceed to SOP 2.2.2.

2.2.1 Non-HRSD Incident Response

If the SSO appears to be discharging from a non-HRSD facility, the first responder would contact the Operations Coordinator and have them report a discharge to the appropriate Locality or private system owner. HRSD may assist in the alleviation of the problem by making changes within the HRSD system, if possible. The Locality/private system owner is expected to address the SSO. HRSD can provide equipment, if requested, as well as spare pipe/valves and personnel. HRSD can also assist with operation of pump stations, isolate valves and provide guidance and expertise. If requested, HRSD may also isolate the SSO point from the system and to contain and control the SSO to minimize public impact. Proceed to SOP 2.4 for Documentation of the incident.

2.2.2 HRSD SSO Response

If an HRSD SSO is confirmed, the first responder contacts the appropriate Supervisor. Three actions are taken as follows:

1. The appropriate Supervisor (or Duty Supervisor if during non-business hours) dispatches a crew to immediately address the SSO. Proceed to SOP 2.3 for SSO Containment, Repair, and Clean Up.
2. The appropriate Supervisor notifies the Permits Manager in the Water Quality Division in accordance with Regulatory Reporting procedures as described in SOP 2.5.
3. The appropriate Supervisor will determine if immediate notification to HRSD's Chief of Public Information is required. General criteria for this determination include the size and scope of the SSO, potential for human contact, and likely traffic disruptions. See Section 2.5.5 of this Plan for specifics on Public Notification of SSOs. Proceed to SOP 2.3.

2.3 SSO Containment, Repair, and Clean Up

2.3.1 Assess the Impacted Area

After locating the SSO, the next step is to identify the total impacted area. The first responder will canvass the area to determine what potential impacts are present to the environment and/or the public and will identify the appropriate steps to minimize/mitigate those potential impacts. This process is assisted by the appropriate Interceptor Systems personnel using maps of the service area to determine possible impacted areas.

The Virginia Department of Health operates through a network of Local Health Districts, including Virginia Beach, Hampton, Chesapeake, Peninsula, Norfolk, Portsmouth, and Western Tidewater. HRSD reports SSOs to the Local Health Districts in addition to the VDEQ, and it is the responsibility of the Local Health Districts to determine the public health impact, closure of shellfish harvesting and/or recreational activity, or other precautions following an SSO.

For SSOs that have potential for direct human contact or public health impact, the appropriate Supervisor shall immediately notify the Technical Services Division and the Chief of Interceptor Systems who shall, in turn, contact the Director of Operations, the General Manager, and Chief of Public Information.

Proceed to SOP 2.3.2.

2.3.2 Establish Control Zone

When the area impacted by the SSO has been identified, the next step is to develop and implement a control zone around the impacted area. The control zone will help limit public access to the affected surface area using appropriate barricading practices. If the control zone includes roadways, then appropriate traffic control measures are taken to protect the public and HRSD personnel.

Where warranted, HRSD may use a pre-printed door hanger which can be completed in the field and left for customers. The door hanger identifies the date and locations of the SSO and provides ways which customers can contact HRSD for more information. See Appendix D for an example. The decision to use door hangers is made on a case by case basis and depends on the extent of the problem area, the expected duration of the incident and other factors. Written public notifications are also used. See Section 2.5.5 for details on Public Notification for SSOs. Proceed to SOP 2.3.3.

2.3.3 Assess the Cause

After the initial control zone is established, the next step is for the Interceptor Systems personnel to assess the site and determine the most appropriate response plan.

HRSD personnel will employ all reasonable means to mitigate the site and promptly restore service to customers. The appropriate Supervisor will determine what resources should be used and request guidance from the Interceptor Systems Chief in the event of any unusual situations or should a consultation be warranted regarding the response plan. Proceed to SOP 2.3.4.

2.3.4 Identify Resources and Technique Requirements

The appropriate Supervisor will identify the necessary resources and techniques based on site accessibility, location of the disruption of service, size of impacted area, the opportunities to minimize any impacts to the environment and the public. Proceed to SOP 2.3.5.

In an emergency situation, HRSD can initiate special procurement or contractual processes to access additional resources from outside contractors or other nearby utilities, as needed. If this situation arises, the appropriate Supervisor will review the SSO with the Interceptor Systems Chief, who will take the appropriate action.

2.3.5 Contain and Control SSO

A physical barrier to control further dispersal of wastewater will be established to help reduce adverse impacts, when feasible. Containment procedures will vary on a case-by-case basis. An appropriately developed and established containment plan will consolidate the wastewater into a defined area. Sand-bagging or other constricting methods may be used when site and weather conditions allow, entry points into the storm water system may be obstructed using various methods that may include sand bags, inflatable plugs, or simply redirecting the flow using construction equipment to “dam up” areas or dig a temporary sump area. The impounded wastewater can then be vacuumed or pumped back into another portion of the system. This collected volume along with the uncollected volume will be estimated and documented for notification to the regulatory agencies.

When possible, flow retrieval and diversion techniques provide an effective means of controlling the SSO and returning it back into the sewer system. It reduces potential impact on the immediate area and the possibility of impacts downstream. The flow retrieval and diversion techniques employed by HRSD when practicable include, but are not limited to, the following:

<u>Bypassing measures</u> – In certain situations, portable bypass pumps can be used to collect pooled/captured wastewater and convey it back to the sanitary sewer system, at a point outside of the influence of the SSO location. This method is most effective with a single identified problem area and when the discharge can be directed to closest available wastewater system that does not contribute to the location where the SSO is present. This bypassing approach can be used in conjunction with other containment measures or independently.

Pump and haul procedures – Pump and haul equipment provides an additional resource for the collection of discharged wastewater and its conveyance back to the sanitary sewer system, beyond the location experiencing the service disruption. This equipment can be used in conjunction with other containment measures or independently. Typical equipment includes vacuum and septic tanker trucks.

Temporary diversion – In some cases, flow may be diverted away from the point of service disruption by the use of valves to redirect flow to another portion of the system.

Once the SSO is controlled and contained, proceed to SOP 2.3.6.

2.3.6 Mitigation / Remediation Solutions

HRSD will mitigate and remediate the SSO depending on the cause of the SSO, as follows.

2.3.6.1 Wet Weather SSOs

Wet weather SSOs are usually caused by significant amounts of inflow and infiltration (I/I) and/or force main system pressures. Mitigation is difficult until the weather event which triggered the SSO subsides. Additional pumping capacity (either bypass pump or pump-and-haul) is the primary solution if other problems are not created down stream or elsewhere in the system. HRSD will utilize an appropriate type of mitigation technique based on the situation and proceed to SSO Clean Up in SOP 2.3.7.

2.3.6.2 Dry Weather SSOs

Dry weather events are addressed using several methods. Field personnel will identify the most effective method or combination of methods to return service to the system. Field crews may use Closed Circuit Television (CCTV) inspection to identify the cause and location of the problem and help determine the necessary techniques needed to eliminate it.

The following common mitigation techniques can be used independently or in combination depending on field conditions:

Pipeline Failure – An emergency pipe repair is required to replace the defective or collapsed pipe. Necessary containment and diversion procedures will be in place until the appropriate repairs are completed.

Pump Station Failure – Bypass pumping or pump and haul will be used until the mechanical, electrical, instrumentation, or other needed repairs are completed at the pump station. In the event of lost electrical power service to a pump station, HRSD has permanent (at some sites) and portable generators available to provide temporary power to the station until service is restored.

HRSD will utilize an appropriate type of mitigation technique based on the situation and proceed to SOP 2.3.7.

2.3.7 SSO Clean Up

The goal of the clean up practice is to restore the site to pre-event conditions using a variety of practices. Methods used in the clean up of impacted areas include vacuuming, disinfecting and other mechanical and manual measures. Each SSO is unique and the clean up required varies from minor to extensive efforts.

HRSD responders employ common practices as appropriate to an individual cleanup situation, including but not limited to:

Manual Practices – Manual cleanup techniques include the use of hand tools, such as rakes, shovels, brooms, etc., to remove and properly dispose of all readily identifiable material (wastewater solids, papers, plastics, etc.) which originate from the sewer system.

Mechanical Practices – Mechanical cleanup techniques utilize vacuum trucks and similar equipment to remove all solids and remaining standing wastewater and properly dispose of them. Flushing trucks may be used to further clean areas, as needed. Flushing water is then vacuumed and removed.

Disinfection Practices – Apply lime or other disinfecting agents, as necessary to disinfect the area.

A follow-up phone call to Water Quality should be made according to SOP 2.5 after stopping the SSO. Documentation of the SSO should be made according to SOP 2.4.

2.4 Documentation

2.4.1 HRSD SSO Documentation

An RRF is completed by the appropriate Supervisor for each SSO event and submitted to the NS/SS Interceptor Chief with the information regarding the SSO. A blank copy of this form is provided in Appendix A. The NS/SS Interceptor Chief will review the form and forward it to Water Quality for review and input in the SSO Database and SSORS. Proceed to SOP 2.5 for Regulatory Reporting.

2.4.2 Non-HRSD System Documentation

HRSD records information on wastewater problems outside of HRSD's system in a Non-HRSD System Reporting Form (see Appendix C). This form is filled out by the appropriate Supervisor and forwarded to the NS or SS Interceptor Systems Chief as well as the Water Quality Permits Manager for review. Water Quality creates a new record in the separate database for the Non-HRSD System RF. Interceptor Systems will coordinate with HRSD's Special Assistant for Compliance Assurance to provide a copy of the approved Reporting Form to the Locality where the event has occurred. If the event is related to a private sewer facility, HRSD will make a good faith attempt to provide a copy of the Reporting Form to the private owner; however, in some instances the owner may not be easily determined. Unless action is required by HRSD in SOP 2.3 to protect the public, the environment, or property, this step concludes HRSD's SOP.

2.5 Regulatory Reporting

Data collection for reporting to regulatory agencies is accomplished by transfer of information from Interceptor Systems Field Staff to Water Quality through an initial phone call, change-in-status phone call, final phone call, and written report as follows. The procedures differ depending on if the reporting is during normal business hours or non-business hours.

2.5.1 First Telephone Report

2.5.1.1 First Telephone Report During Normal Business Hours

Upon confirmation that an HRSD SSO has occurred, the appropriate Supervisor will contact the Permits Manager and provide information (see bulleted list below) to the degree it is available. In this or any subsequent contacts, if the Permits Manager is unavailable, then the reporting Supervisor will notify a Technical Services Division (TSD) Environmental Scientist (see Technical Services Telephone list in Appendix F). The reporting supervisor is instructed to not leave a voicemail message but rather to talk directly to a member of the TSD. If the TSD Environmental Scientists are not available, the reporting Supervisor dials the TSD emergency cell phone (see Technical Services Division Telephone list in Appendix F).

Based on the information from the reporting Supervisor, the Permits Manager (in consultation with Interceptor Systems) will determine if the incident is reportable as a Sanitary Sewer Overflow (SSO). See Section 1 for distinction in the difference between "reportable" and "non-reportable." If the SSO is determined to not meet the criteria for reporting, proceed to SOP 2.6 for SSO Tracking. Otherwise, the SSO is reported to VDEQ as follows.

The Permits Manager or TSD Environmental Scientist's contacts VDEQ either by telephone or SSORS initial notification (see SOP 2.5.4) and relays the following information, if available, to them as soon as possible but not later than 24 hours of HRSD becoming aware of the SSO:

- Site Name and Type (i.e., force main, gravity main, manhole, pump station, pressure reducing station, etc.)
- Location: Street Address, City
- Date and Time SSO was discovered
- Description of SSO
- Planned Action to Stop and/or Contain SSO
- Estimated Flow Rate (gph or gpm)
- Where is the SSO going? (i.e., storm sewer, stream, ground, etc.)
- Is it reaching or does it have the potential to reach State waters? If so, name receiving waters.

The Permits Manager will record who was notified at VDEQ (or if SSORS was used) along with the time for documentation in the RRF. If the Permits Manager determines that it is necessary, they will continue to call in an effort to reach a responsible VDEQ official. General criteria for this determination include the size and scope of the SSO, potential for human contact, and likely traffic disruptions. The Permits Manager will record and act on, as appropriate, any instructions from the VDEQ official notified. VDEQ is typically responsible for notifying the Virginia Department of Health (VDH) of any SSO. VDH is also notified via email as a part of SSORS.

Following the initial report to the VDEQ, the Permits Manager should proceed with follow-up reporting to VDEQ in SOP 2.5.2, 2.5.3, and 2.5.4.

2.5.1.2 First Telephone Report During Non-Business Hours

During non-business hours, the first responder is responsible for making the first telephone report to VDEQ as soon as possible, but in no event later than 24 hours of the initial SSO confirmation. The Duty Supervisor is responsible for making the initial judgment whether the SSO is a reportable SSO. If the decision is not clear, the Duty Supervisor should proceed with the initial report to the VDEQ. If the SSO is clearly not a reportable event, the Duty Supervisor should provide the details of the SSO to the Interceptor Systems Supervisor and proceed with SOP 2.6 for SSO Tracking.

The information to be relayed to the VDEQ during non-business hours is the same as the information lists in SOP 2.5.1.1. The first responder also contacts the Interceptor Systems Supervisor and the Permits Manager. After normal business hours, the Duty Supervisor may leave a voicemail with the Permits Manager. HRSD should continue the reporting process with SOPs 2.5.2, 2.5.3, and 2.5.4.

2.5.2 Change in Status Telephone Report

The Interceptor Systems Supervisor shall report to the Permits Manager any significant changes in status from the information previously reported. During non-business hours, the Duty Supervisor shall report directly to the VDEQ any significant changes in status of the information previously reported.

If the SSO becomes a reportable SSO, the Permits Manager (or Duty Supervisor) should follow SOP 2.5.1 for VDEQ notification.

The Permits Manager may contact VDEQ and relay information that has changed significantly from the first telephone report. HRSD should continue the reporting process with SOPs 2.5.3 and 2.5.4.

2.5.3 Final Telephone Report

After the SSO has been stopped, the Interceptor Systems Supervisor will report the updated information to the Permits Manager, including:

- SSO Location: Street Address, City
- Date and Time SSO was Discovered
- Description of SSO (force main leak, air vent, etc.)
- Cause of SSO, if known
- Action Taken to Stop and/or Contain SSO
- Time SSO was Stopped
- Estimated Quantity of SSO
- Did the SSO enter the storm drain or State waters? If so, name receiving waters.

If the SSO is stopped during non-business hours, the Permits Manager should be notified on the next business day. HRSD will continue the reporting process with SOP 2.5.4.

2.5.4 SSORS

The Permits Manager will enter the information on all HRSD system SSOs into the Sanitary Sewer Overflow Reporting System (SSORS) database. This online web-based computer application electronically submits the required reporting information to VDEQ and VDH Local Health Districts. Appendix B includes example screen shots and information on the SSORS computer application. The Permits Manager may enter an initial report into the SSORS database shortly after the initial telephone notification to VDEQ or as the initial notification if sufficient information is available. The SSORS database entry for an SSO is expected to be finalized in most cases by a final report within 5 days of the initial identification of the SSO, as well as any update to the final report as described below. Information for the SSO is provided on the RRF as described in SOP 2.6.

2.5.4.1 The 5-Day SSORS Report

The final SSORS report is completed within five days of the initial confirmation of the SSO. This update to the SSORS record is supplemented by the completed RRF provided to Water Quality by the Interceptor Systems Division. The Permits Manager will record the SSORS ID automatically generated by the system and enter it into the SSO Database and onto the RRF. Unless all SSO Tracking and Resolution has been completed in SOP 2.6 and 2.7, proceed to SOP 2.6.

2.5.4.2 Update to the SSORS Report

If information on the SSO is gathered following completion of the final report in SSORS and resolution of the SSO, the entry in the SSORS database may be updated using the procedures detailed in Appendix B. Unless follow up tracking and resolution is required in SOP 2.6 and 2.7, this concludes the SOP for an SSO.

2.5.5 Public Notification of SSOs

Determining the severity of an SSO is a complex matter that is not taken lightly by HRSD staff. All SSOs demand the attention and dedicated response of HRSD. It is clear though that some SSOs have the potential greater public exposure than others and the determination of this potential must be left to the judgment of the experienced wastewater system operators. With the relative infrequency of SSOs from HRSD's system, these decisions are made at the management level in the organization. HRSD has a number of methods as discussed in earlier sections for notifying the public in the event of an SSO that may impact them. The potential for direct human contact, impact to environmentally sensitive areas, and traffic disruption are general criteria that used in the determination of public notification of an SSO.

The following scenarios provide examples of where HRSD has and will provide various levels of public notification for an SSO:

1. A small volume SSO in a remote area of the system with little chance for direct human contact required no extra public notification other than the regulatory reporting which includes the Local Health Districts (this regulatory notification is required and performed for all examples).
2. An SSO adjacent to a single property owner was addressed by direct face-to-face notification by HRSD staff to discuss the situation and provide details on clean-up and schedule for mitigation.
3. An SSO that may lead to traffic disruption on major roads is handled with a traffic advisory. The HRSD Traffic Advisor provides details on the impacted area, specifics on the work being performed, and the timetable to complete the work. Each advisory is distributed to the local radio and print media outlets.
4. An SSO in a neighborhood with discharge to a local pond was addressed with a media news release, a written notice distributed to all affected residences, and personal follow-up discussions with the most affected neighbors.
5. An SSO from a 42-inch force main in a neighborhood with a discharge to a nearby waterway precipitated a news release (picked up by the local daily newspaper and TV station), a written notice distributed to all affected residences, a partial road closure, and personal follow-up discussions with the most affected neighbors. The Local Health District made the determination whether swimming or other recreational uses of the waterway was affected and made their public notification.
6. An SSO occurred in a marsh area from an 18-inch force main that was in a difficult point to access for repair. Although the discharge of wastewater was contained quickly after discovery, a long-term repair required more than 6 months of public interaction and notifications. Upon discovery, a joint news release was issued with the affected locality which was covered by the local daily newspaper. A

written notice was distributed to all affected residences, with follow-up notices issued every two weeks until a public meeting was held. Local community liaisons were identified and communication on the SSO repair was provided through email routinely until the repair and restoration was complete. Many personal meetings were held with the affected residents to provide information concerning the SSO response.

2.6 SSO Tracking

The Interceptors System Division will forward the RRF to the Permits Manager within 3 days of the event. The Permits Manager will review the Interceptor System Regulatory Reporting Form (see Appendix A) for accuracy and completeness. This form will include documentation of diversion techniques, mitigation techniques, and clean-up practices that were used. If any additional information is needed, the Permits Manager will contact the Interceptor Systems Supervisor to obtain it. A copy of the RRF for each SSO is maintained by the Permits Manager for a period of at least five years with the information also stored in the SSO Database described below.

The Permits Manager will create a new record in the SSO Database and transfer data from the RRF along with SSORS ID. The data fields in the SSO Database and SSORS regarding cause, duration, and volumes must match. There may be additional information tracked in the HRSD SSO database which is not necessary to include in SSORS.

Via the SSORS email function, appropriate HRSD staff (including the Data Analysis Manger) is notified of the SSO. Water Quality notifies other HRSD staff at their discretion. Water Quality notifies the Data Analysis Manager of any confirmed HRSD SSO that is not reportable through SSORS. Proceed to SOP 2.7.

2.7 SSO Resolution

Each confirmed SSO is subject to an evaluation process shown in the workflow diagram (see the figure following this section). The SSO evaluation process will consider at each step if the cause was a result of a wet weather event beyond the maximum level of service or if the timeframe between SSOs was sufficiently long enough to be considered unrelated. The following tasks will be completed in accordance with the workflow diagram:

1. The SSO point is loaded by the Planning and Analysis Division into the GIS system which assists with determination if the SSO is a recurring event. If the SSO is in the same location and has a similar cause of a previous SSO, Planning and Analysis will convene an Ad hoc Action Committee (AAC) to meet regarding this specific SSO. Proceed to SOP 2.7.1.
2. System pressures, flows, rainfall, groundwater conditions, and modeling results are evaluated by the Data Analysis Manager (DAM), Interceptor Operations and the Hydraulic Analysis Manager (HAM). If the team determines that a potential capacity issue exists, Planning and Analysis will convene an Ad hoc Action Committee (AAC) to meet regarding this specific SSO. Proceed to SOP 2.7.1.
3. Planning and Analysis will review system data (including CCTV records) and facility data with Interceptor Operations to determine if recurrence of the SSO is likely. If the team determines that recurrence of the SSO is likely, Planning and Analysis will convene an Ad hoc Action Committee (AAC) to meet regarding this specific SSO. Proceed to SOP 2.7.1.

4. Planning and Analysis shall update the SSO Database with the information gathered in the evaluation process.

5. Planning and Analysis will notify Water Quality of completion of the SSO investigation for updating SSORS. Depending on the complexity of the resolution, this notification may occur before or after the 5-day notification to DEQ is required. Proceed to SOP 2.5.4.

2.7.1 Ad hoc Action Committee

The AAC will review the data, existing CIP, and existing rehabilitation projects, and generate an Action Plan (and schedule) for resolution of any SSO that meets the criteria in SOP 2.7. Each Action Plan will include a list of stakeholders within HRSD that are either responsible for implementing or tracking the SSO resolution. The Action Plan will be distributed to the stakeholders by Planning and Analysis for implementation. Summary information on the Action Plan will be entered into the SSO Database along with a planned completion date and actual completion date. Once the Action Plan is generated, Planning and Analysis will continue with the evaluation process of SOP 2.7.

Planning and Analysis will track completion of the Action Plan using periodic reports generated from the SSO Database that shows outstanding Action Plans, and convene the AAC on a periodic basis (quarterly) to review the status of the outstanding Action Plans. If an Action Plan identifies that long-term rehabilitation, a major repair or replacement is the appropriate solution, the project will be included in the Capital Improvement Program (CIP). The CIP is developed on an annual basis and is reviewed and prioritized using the most recent operations and maintenance data. During the periodic CIP reviews, existing project status is reviewed, compared to the outstanding Action Plans, and potential new CIP needs are identified.

2.8 System Pressure Monitoring and Record Keeping

As part of the Special Order by Consent and the Consent Decree, HRSD has developed an implemented a wide-scale Flow, Pressure, and Rainfall Monitoring Program. System pressure is monitored at more than one hundred locations throughout the HRSD service area and the data is continuously uploaded to a centralized data server. The details on this program are provided in the Flow, Pressure, and Rainfall Monitoring Plan submitted in April 2009 and approved by the VDEQ and EPA on February 23, 2010.

All Localities in the HRSD service area have been provided access to the data server and therefore have complete access to monitor pressures in HRSD's system within their Locality. This information will be maintained as required by the Consent Decree for a period no shorter than 5 years.

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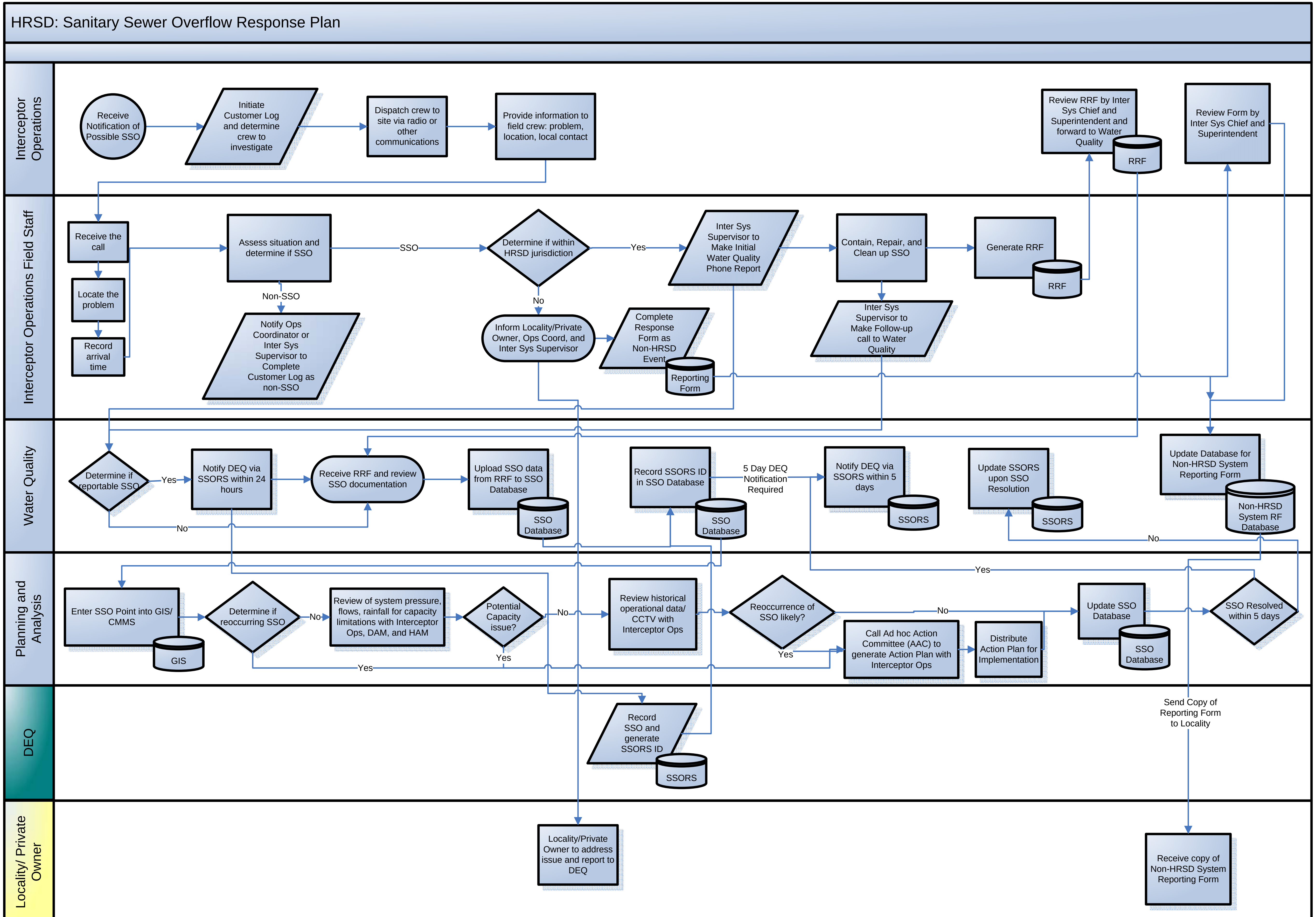

HRSD: Sanitary Sewer Overflow Response Plan
Interceptor Operations
Interceptor Operations Field Staff
Water Quality
Planning and Analysis
DEQ
Locality/ Private Owner
Receive Notification of Possible SSO
Initiate Customer Log and determine crew to investigate
Dispatch crew to site via radio or other communications
Provide information to field crew: problem, location, local contact
Review RRF by Inter Sys Chief and Superintendent and forward to Water Quality
RRF
Review Form by Inter Sys Chief and Superintendent
Receive the call
Locate the problem
Record arrival time
Assess situation and determine if SSO
SSO
Non-SSO
Notify Ops Coordinator or Inter Sys Supervisor to Complete Customer Log as non-SSO
Determine if within HRSD jurisdiction
Yes
No
Inform Locality/Private Owner, Ops Coord, and Inter Sys Supervisor
Complete Response Form as Non-HRSD Event
Reporting Form
Inter Sys Supervisor to Make Initial Water Quality Phone Report
Contain, Repair, and Clean up SSO
Inter Sys Supervisor to Make Follow-up call to Water Quality
Generate RRF
RRF
Determine if reportable SSO
Yes
No
Notify DEQ via SSORS within 24 hours
Receive RRF and review SSO documentation
Upload SSO data from RRF to SSO Database
SSO Database
Record SSORS ID in SSO Database
SSO Database
5 Day DEQ Notification Required
Notify DEQ via SSORS within 5 days
SSORS
Update SSORS upon SSO Resolution
SSORS
Update Database for Non-HRSD System Reporting Form
Non-HRSD System RF Database
No
Yes
Enter SSO Point into GIS/ CMMS
GIS
Determine if reoccurring SSO
No
Yes
Review of system pressure, flows, rainfall for capacity limitations with Interceptor Ops, DAM, and HAM
Potential Capacity issue?
No
Yes
Review historical operational data/ CCTV with Interceptor Ops
Reoccurrence of SSO likely?
No
Yes
Call Ad hoc Action Committee (AAC) to generate Action Plan with Interceptor Ops
Distribute Action Plan for Implementation
Update SSO Database
SSO Database
SSO Resolved within 5 days
Send Copy of Reporting Form to Locality
Record SSO and generate SSORS ID
SSORS
Locality/Private Owner to address issue and report to DEQ
Receive copy of Non-HRSD System Reporting Form

3. TRAINING AND MAINTENANCE OF PLAN

This section of the document describes the plan review, approval and update process, and the training program.

3.1 Plan Review, Approval, and Update

The SSO RP document will be reviewed as people, processes and systems change. Review of the plan will typically be on an annual basis, unless a significant change in wastewater system staff, internal and external contacts, or roles and responsibilities occurs. The plan revision will be dated for a specific publishing date with an increasing revision number. Minor revisions are indicated with an increase in the decimal place (e.g., 1.1, 1.2, and 1.3) and major revisions are indicated with an increase in the integer place (e.g., 1.0, 2.0, and 3.0).

3.2 Safety Training for all Interceptor System Personnel

Equally important as the creation of the plan, is training of personnel on its content and how to use it. The safety hazards in the collection systems are many and varied. HRSD personnel that have occasion to respond to an SSO receive the following training:

3.2.1 Confined Space Entry Safety Training

This training is supplied by the Safety Division and is designed to instruct employees on proper procedures as defined in OSHA 29 CFR 1910.146. The training includes:

- Identifying permit and non-permit required confined spaces
- The roles of the confined space supervisor, attendant, and entrant
- Gas detection systems
- Ventilation systems
- Personal Protective Equipment (PPE)
- Non-entry rescue equipment and procedures

3.2.2 Excavation and Trenching Safety Training

This training is supplied by the Safety Division and trains employees on methods and standards as defined in OSHA 29 CFR 1926.650. The training includes:

- Competent person responsibilities
- Protective systems
- Sloping and benching
- Soil classification
- PPE

3.2.3 Hazard Communication Training (Hazcom)

Hazcom training is supplied to all HRSD employees when first hired. Refresher training is supplied to all employees that may encounter hazardous chemicals.

3.2.4 AED/CPR/First Aid Training

AED/CPR/First Aid certification training is given to all Operations employees. Retraining is performed every two years.

The Safety Division performs supplemental safety trainings throughout the year on various topics such as:

- Back Safety
- Heat Stress
- PPE
- Work Zone Design and Awareness
- Fire Training
- Asbestos

Monthly safety training sessions are performed each month by Operations supervisors covering safety issues pertaining to their job activities. Regular safety briefs are also done by supervisors and crew leaders.

3.3 HRSD Apprenticeship Program

In addition to safety training, HRSD has also established an Apprenticeship Program. HRSD created the nation's first wastewater industry apprenticeship program to perpetuate excellence in our workforce. Our apprenticeship programs (Plant Operator, Maintenance Operator, Interceptor Technician, Instrument Specialist, Electrician, Equipment Technician, and Carpenter) are custom-designed to help individuals achieve the training and experience needed for a successful HRSD career. Apprentices can receive a training increase and a merit increase each year. Operator apprentices obtain the skills and credits needed to earn their licenses and the accompanying bonuses. Some positions require successful completion of the apprenticeship program as a condition of continued employment.

HRSD's apprenticeship programs are a combination of on-the-job training and related classroom instruction. All can be completed in four years except the electrician's program, which requires five years. HRSD's programs are recognized and approved by the Virginia Department of Education, the Virginia Department of Labor and Industry, the US EPA and the US Department of Labor.

3.4 Training

Training to implement the SSO Response Plan is separated in to distinct pieces: how to address an SSO in the field, and what are the reporting and record keeping requirements.

3.4.1 SSO Field Response Training

To ensure that the HRSD's personnel are effective and prepared in managing an emergency situation, HRSD provides ongoing training. This training provides the means for those involved in response to SSOs to acquire skills that fulfill their roles. On-going formalized operational training is provided by HRSD's apprenticeship program. This four year accredited program is a combination of formal educational classroom instruction combined with a significant amount of on the job training (OJT). Interceptor Technicians graduate from this program with a VDOR licensed Journeyman's card and gain the experience and knowledge needed to react and respond to the various SSO issues that may arise from a multitude of operational scenarios.

Implementing the SSO RP also helps to determine where enhancements are necessary, so that revisions to the plan can be made accordingly.

3.4.2 Reporting and Record Keeping Training

HRSD has identified personnel that receive training in SSO reporting and record keeping, primarily individuals that are first responders to an incident, and the personnel involved in reporting an SSO to the regulatory agencies. The training (conducted by the Water Quality Permits Manager) includes clarification of responsibility for reporting spills in the system, review of the reporting requirements and timeframes, reporting procedures for both business and non-business hours, required information needed in reporting.

This training will be conducted by HRSD on an annual basis or when the following occurs:

- New hires responsible for reporting or record keeping; or
- Procedures are updated or revised.

APPENDIX A: HRSD INTERCEPTOR SYSTEMS REGULATORY REPORTING FORM

DEQ PREP NUMBER (Assigned by DEQ personnel) ___________________________________

HRSD INTERCEPTOR SYSTEMS REGULATORY REPORTING FORM

SITE NAME (manhole, fm, PS, etc.) ______________________________________

STATION/LINE/MANHOLE # _________________________

GPS COORDINATES NORTHING______________________

EASTING ________________________

ADDRESS ___________________________________

CITY ___________________________

PERSON REPORTING ____

DATE/TIME PROBLEM DISCOVERED __________________________________

PERSON/ORGANIZATION WHO DISCOVERED PROBLEM ____________________________________

DAT/TIME HRSD STAFF ONSITE OF PROBLEM ____

DESCRIPTION AND CAUSE OF PROBLEM ____

____

____

CORRECTIVE ACTION TAKEN____

____

____

____

DATE/TIME RELEASE ENDED ___________________________________

TOTAL QUANTITY RELEASED ______________________________GALLONS

TOTAL QUANTITY RECOVERED (if applicable) ______________________GALLONS

TOTAL QUANTITY NOT RECOVERED ______________________________GALLONS

PATH OF RELEASE (storm drain, ditch, ground, etc.) ____

NAME OF RECEIVING WATERS (if applicable) ____

DISCHARGE CALCULATION (if needed)

INITIAL FLOW RATE (GPM): ________________

START TIME: ____________
END TIME: ____________

ELAPSED TIME: __________________

(1) TIME X GPM = ________________ GAL

FINAL FLOW RATE (GPM):___________

START TIME: ____________
END TIME: ____________

ELAPSED TIME: __________________

(2) TIME X GPM = ________________ GAL

COMMENTS ____

____

____

____

TECHNICAL SERVICES DIVISION NOTIFIED:

NAME ________________________________

DATE _____________ TIME ____________

FILL IN FOLLOWING IF INTERCEPTOR STAFF CALLED REGULATORY AGENCY DIRECTLY:

REGULATORY AGENCY INITIAL NOTIFICATION (DEQ 518-2077 DES 1-800-468-8892)

DEQ_________ DES ___________

NAME: ____

DATE/TIME NOTIFIED: __________________________________

UPDATE REPORTED TO:

DEQ_________ DES ___________

NAME: ____

DATE/TIME NOTIFIED: __________________________________

REGULATORY FINAL NOTIFICATION:

DEQ_________ DES ___________

NAME: ____

DATE/TIME NOTIFIED: __________________________________

TSD Comments

____

____

____

____

APPENDIX B: SSORS SCREEN EXAMPLES

Sanitary Sewer Overflow Reporting System (SSORS)
Introduction

Welcome to SSORS!

SSORS is a web-based spill reporting and tracking system, developed by the Hampton Roads Planning District Commission. It simplifies the initial notification and 5-day letter reporting requirements for sanitary sewer overflows. DEQ, HRSD, HRPDC and participating Hampton Roads municipalities all have privileges and responsibilities within the SSORS system.

The SSORS process and user capabilities are presented in the following diagrams. The basic idea is that when a sanitary sewer overflow (SSO) occurs:

1. HRSD or the local municipalities can enter their initial notification and 5-day letter information using a web browser,
2. SSORS will validate the data and automatically send e-mail notifications to DEQ and other parties,
3. DEQ will assign their Internal Reference number in SSORS, and
4. The organization submitting the initial notification can follow up using the same process to complete their 5-day letter.

Sanitary Sewer Overflow Reporting System (SSORS)
Introduction

New 2008 Version!

SSORS has been upgraded with many new features and under-the-hood code enhancements.

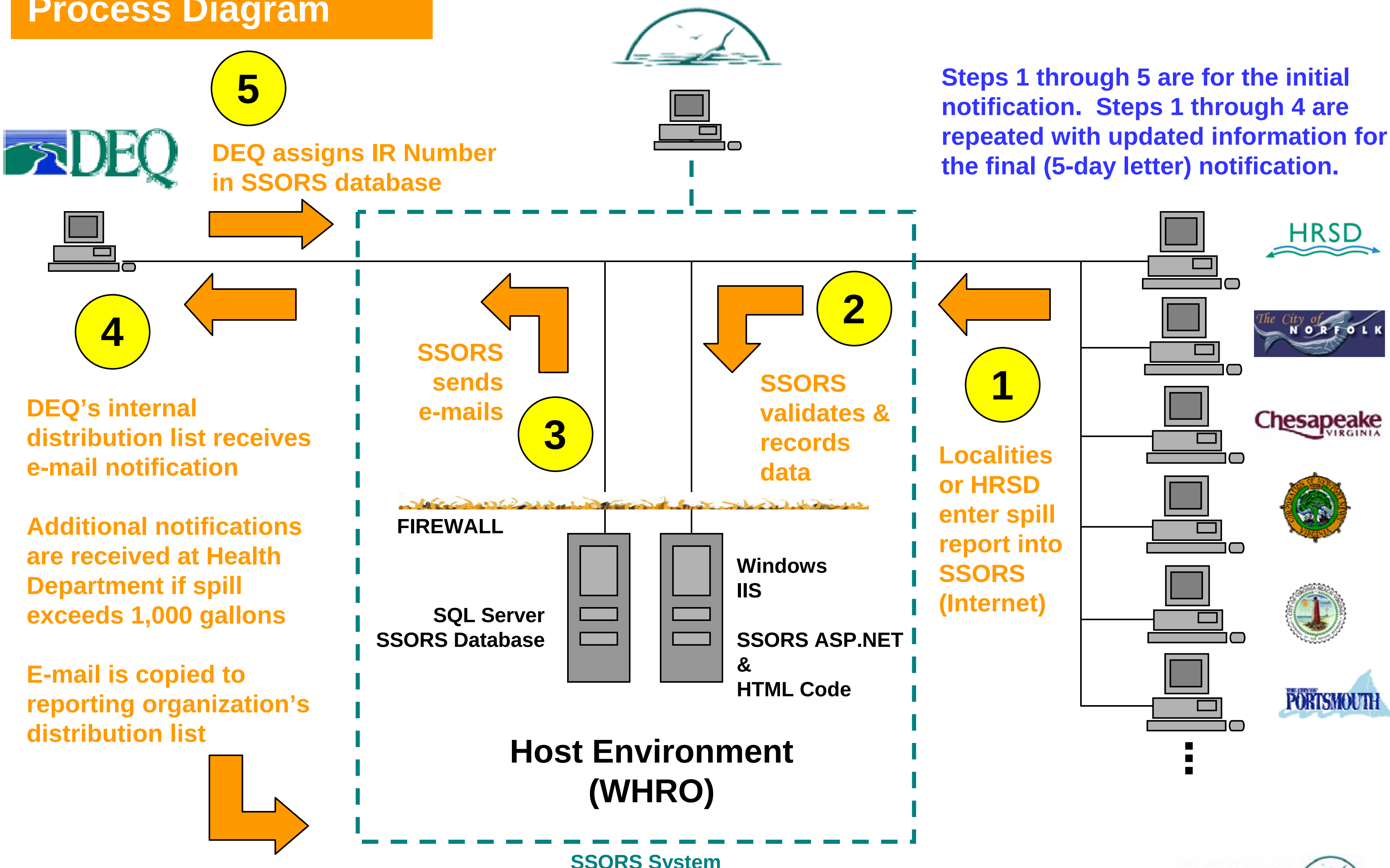
New capabilities include:

- The ability to add file attachments.
- A request procedure and mechanism to strike records from the database.
- Enhanced reporting capabilities, including file attachment icons, and the ability to filter for spills by responsible party within a jurisdiction.
- Character length limitations on data entries have been removed.
- An SSO spill classification capability has been added to comply with consent order requirements.
- A capability for DEQ to add comments when assigning IR numbers.
- A capability for DEQ to strike records (due to duplicate entries, private spills, etc.).
- Broadcast e-mail capabilities for DEQ and HRPDC
- A Password retrieval routine.
- A new Contact Us page to report problems.
- “On-the-fly” report generation.
- Many code, platform and environment enhancements.

Sanitary Sewer Overflow Reporting System (SSORS)

Introduction

Process Diagram



2008 Update

Sanitary Sewer Overflow Reporting System (SSORS)

Introduction

Capabilities Diagram

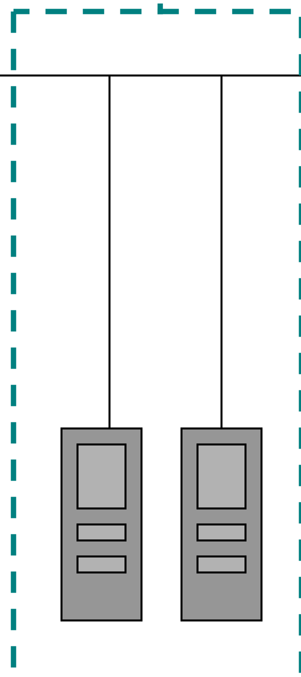
Within HRPDC

- **Administer:**
  - **SSORS Code**
  - **SSORS Database**
  - **Distribution List (not used currently)**
- **View Reports**
- **Post Regional News Items**

Within DEQ

- **Administer:**
  - **Users & Permissions**
  - **Distribution List**
- **View Reports**
- **Post DEQ News Items**
- **Assign IR Numbers**
- **Make Comments in response to spill notification.**
- **Strike records from SSORS**

DEQ cannot edit spill report data entered by HRSD or the municipality.



SSORS System

Within HRSD or Municipality

- **Administer:**
  - **Users & Permissions**
  - **Distribution List**
- **Enter Data**
- **Correct/Revise Data**
- **View Reports**
- **Submit Initial Notification**
- **Submit 5-Day Letter**
- **Post Local News Items (Local to HRSD or Municipality)**
- **Request record(s) to be Stricken**

2008 Update

Sanitary Sewer Overflow Reporting System (SSORS)
Introduction

SSORS Benefits

- Simplifies and standardizes the SSO reporting process
- Keeps all spill report information in a central database
- Reduces reporting errors through simple data validation
- Provides flexibility in user privileges
- Allows local administrators to manage their own users and data
- Provides direct data export for ad-hoc analyses
- Provides data to verify that reporting requirements were met
- Permanently archives all spill report information
- Provides complete incident reporting history (nothing is erased)
- Reduces the current paperwork burden
- Allows for future expansion of capabilities, such as georeferencing
- Solves problems for regulators and system operators

Sanitary Sewer Overflow Reporting System (SSORS)
Introduction

Getting Started

- Each participating municipality and HRSD is given an account on the system with local administrative privileges.
- Before any individual can use SSORS, the local administrator must first create a user account for them in the system.
- Users must log into the system (there is no guest or anonymous access).

- HRPDC will offer SSORS training periodically.
- The SSORS Help page contains self-guided tutorials in the form of PowerPoint presentations.

Sanitary Sewer Overflow Reporting System (SSORS)
Creating a Spill Report (Initial Notification)

Spill Report, Create

Regular users and administrators can create, edit and submit spill report information.

Fields that are not marked as 'Optional' are required. If you don't know the information in a required field, enter text such as a question mark, 'TBD', or 'Unknown'. The point is you must enter something in all the required fields. Unknown information can be filled in later. For required date fields, you must enter a valid date (if unknown, make your best guess).

Your user information is automatically pulled from the SSORS database when you log in.

'Active' text boxes and controls can be written in or changed. If the text box or control is 'inactive' you cannot input or change the value.

There are several sets of optional data, including: zip code, 'phoned in' time and date, and state plane northing and easting coordinates. The phoned in fields simply allow you to record the date and time that you phoned in the initial notification to DEQ (if you did). If you didn't phone in the report to DEQ, leave these fields blank.

Sanitary Sewer Overflow Reporting System (SSORS)
Creating a Spill Report (Initial Notification)

(Cont.)

All of the data fields have validation on them, so they should prompt you immediately if you mis-enter any data. For example, if you enter state plane coordinates, the northing must be in the range 3,336,100 to 4,441,000 and the easting must be in the range from 9,936,600 to 12,466,600.

Once the units (gallons or cubic feet) are set on this (create spill report) form, they cannot be changed later. This stipulation is to prevent mixed units from being entered in the subsequent reporting. (For example, we wouldn't want to see that 1,200 gallons were spilled, 110 cubic feet were recovered, and 20 gallons reached state waters.)

When the spill report is created, a SSORS ID number is automatically generated. That number will stay with the report forever, and will not change.

Sanitary Sewer Overflow Reporting System (SSORS)
Creating a Spill Report (Initial Notification)

(Cont.)

DEQ will receive the report notification by e-mail, and will assign an IR number. Until they do so, the IR number will be blank. Only DEQ can assign or edit the IR number.

E-mail notifications will be sent to DEQ's distribution list when the initial report is submitted through SSORS. E-mail copies will be sent to the sending party's distribution list. These distribution lists now include Health Department contacts. Previously there was a separate procedure where the Health Department would be notified if the spill quantity was larger than 1,000 gallons (or 133.7 cubic feet), but now the Health Department is receiving copies of the e-mail notifications for all spills, regardless of quantity.

Note that none of the spill report information entered into the SSORS database will ever be over-written or erased. It is possible to track all of the edits made to a report over time by requesting a history in the printouts process.

Sanitary Sewer Overflow Reporting System (SSORS)
Creating a Spill Report (Initial Notification) (Cont.)

DEQ has decided to adopt the convention that if a quantity is truly unknown, and cannot be reasonably estimated, enter a negative one ("-1" without the quotes) for the 'amount' value on the form. Entering a -1 quantity should only be used in extreme situations where the quantity is truly unknown. In almost all cases, DEQ strongly prefers that you make a reasonable guess than use a -1. If a quantity is reported as unknown (i.e. it is entered as a -1), an alert will be included in the e-mail subject line.

USERS may now (beginning with the 2008 version) attach electronic files and documents to the spill reports. These items are not transmitted with any e-mails or reports, but remain on the SSORS server and can be accessed by clicking on the corresponding icon embedded in the report. ATTACHMENTS CAN ONLY BE ADDED AFTER THE INITIAL REPORT HAS BEEN PROCESSED. (Tip: after submitting the initial report, you can immediately edit the report and add the attachment.)

DEQ can provide comments on the specific spill reports when they assign their DEQ IR Number; comments will be e-mailed to your distribution list (and to DEQ's distribution list).

Sanitary Sewer Overflow Reporting System (SSORS)

Creating a Spill Report (Initial Notification) (Cont.)

USERS must now choose an SSO Classification for the spill incident (to help achieve compliance with applicable consent order requirements).

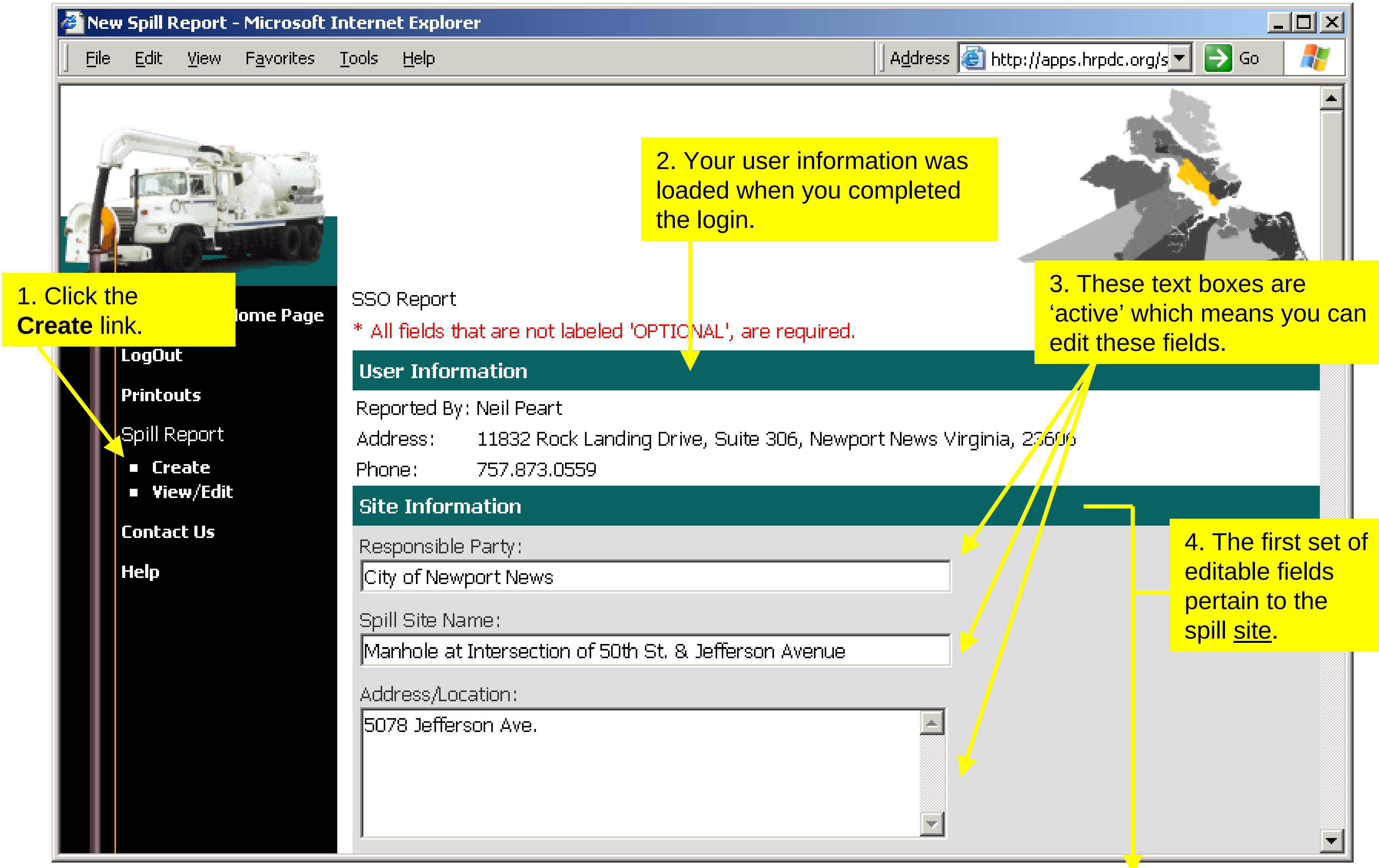
Please note that the "Date/Time Incident was Under Control" is an optional item for the initial report, but is required for the final report.

Some overflow events are of unknown responsibility when the event occurs. SSORS is NOT Intended to be used to track private spills. If you have a private spill incident, report it to DEQ through other channels (phone call, e-mail or fax). Do NOT use SSORS to create a spill report when you know the incident is a private spill. But…

…If you enter an incident in SSORS, and later discover that the responsibility is private, you may request that DEQ strike the record, and note that the incident is a "Private Spill" in your strike request. Private spills will not show up in ordinary reports (after DEQ strikes the record). There is a separate report option for stricken records.

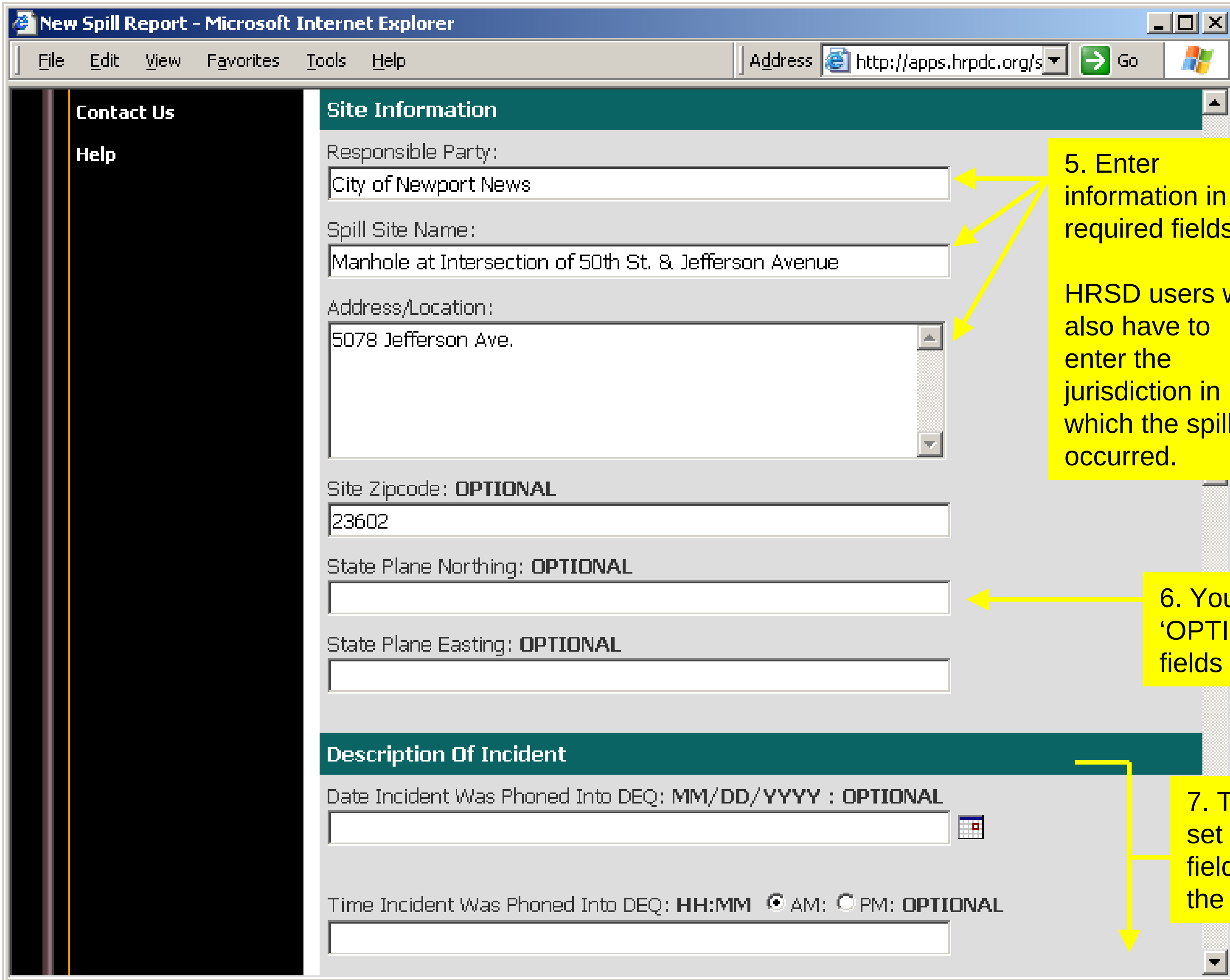
Sanitary Sewer Overflow Reporting System (SSORS)

Creating a Spill Report (Initial Notification)



Sanitary Sewer Overflow Reporting System (SSORS)

Creating a Spill Report (Initial Notification)



5. Enter information in all required fields.

HRSD users will also have to enter the jurisdiction in which the spill occurred.

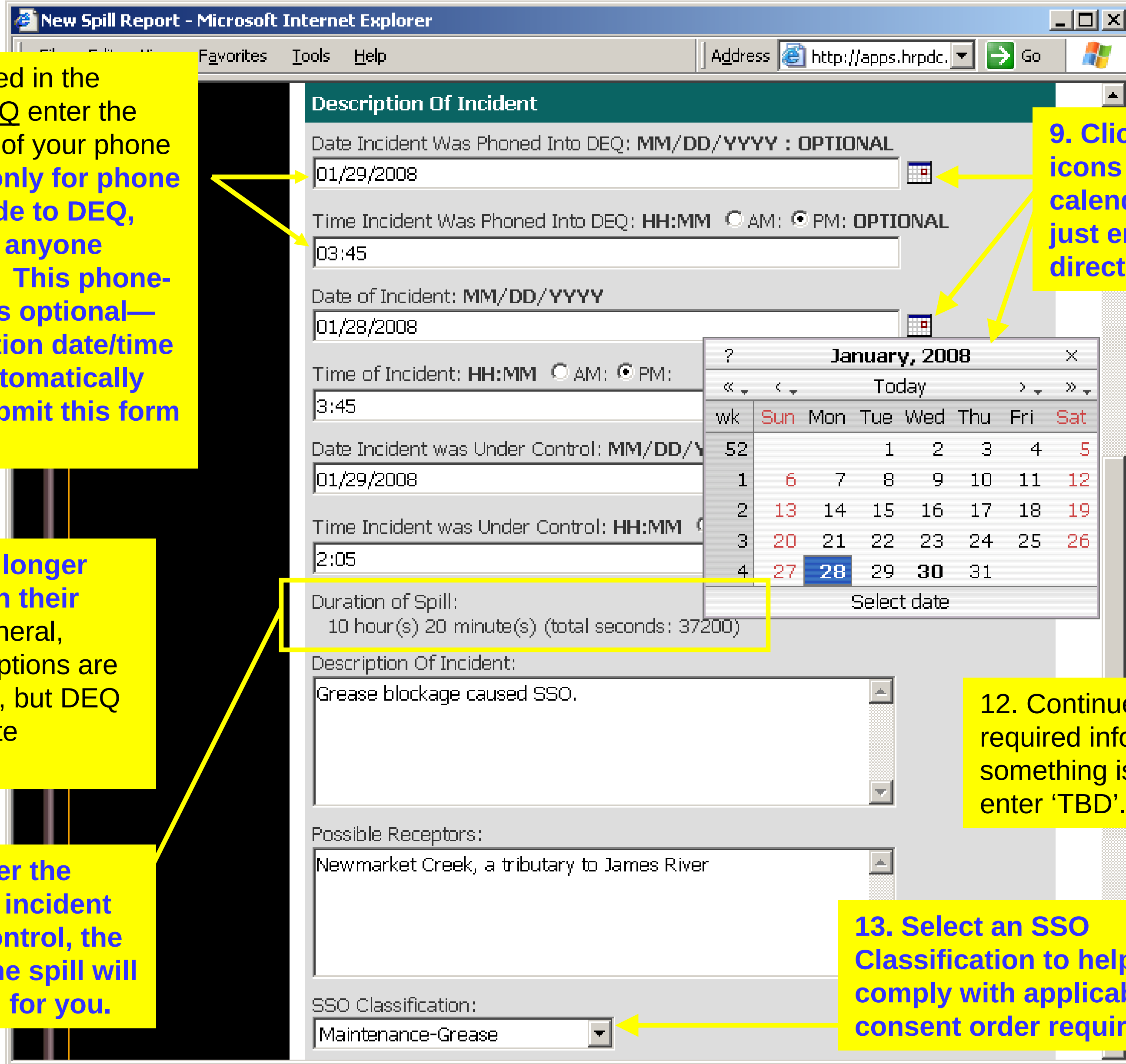
6. You may leave 'OPTIONAL' fields blank.

7. The second set of editable fields pertain to the spill <u>incident</u>.

Sanitary Sewer Overflow Reporting System (SSORS)

Creating a Spill Report (Initial Notification)

8. If you phoned in the incident to DEQ enter the date and time of your phone call. **This is only for phone calls you made to DEQ, not calls that anyone made to you. This phone-in date/time is optional—your notification date/time will be set automatically when you submit this form to DEQ.**



9. Click on the calendar icons to bring up a calendar control (or just enter the date directly).

10. **Fields no longer have limits on their length.** In general, lengthy descriptions are not necessary, but DEQ wants complete information.

11. If you enter the date/time the incident was under control, the duration of the spill will be calculated for you.

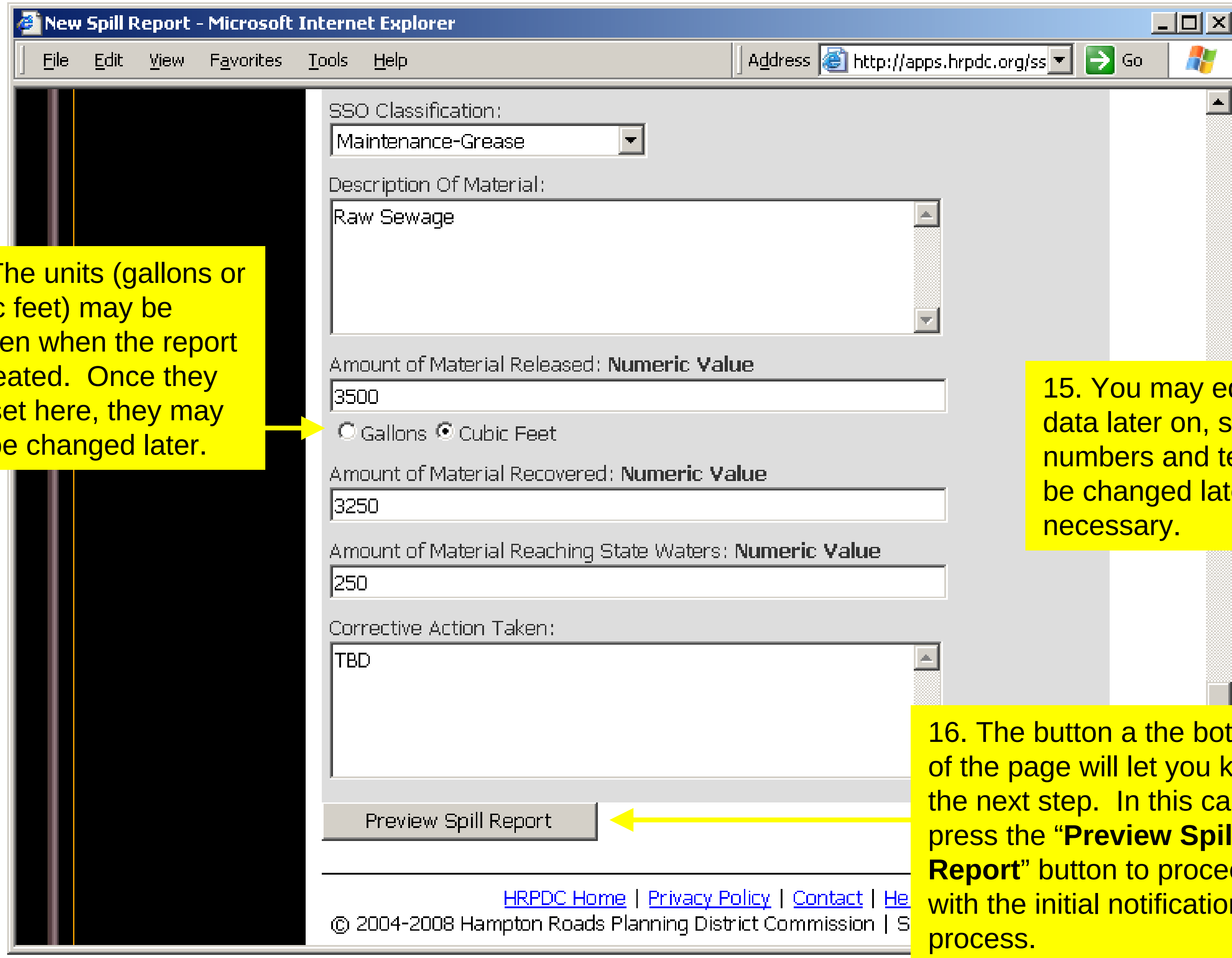
12. Continue entering the required information. If something is unknown, enter 'TBD'.

13. Select an SSO Classification to help comply with applicable consent order requirements.

2008 Update

Sanitary Sewer Overflow Reporting System (SSORS)

Creating a Spill Report (Initial Notification)



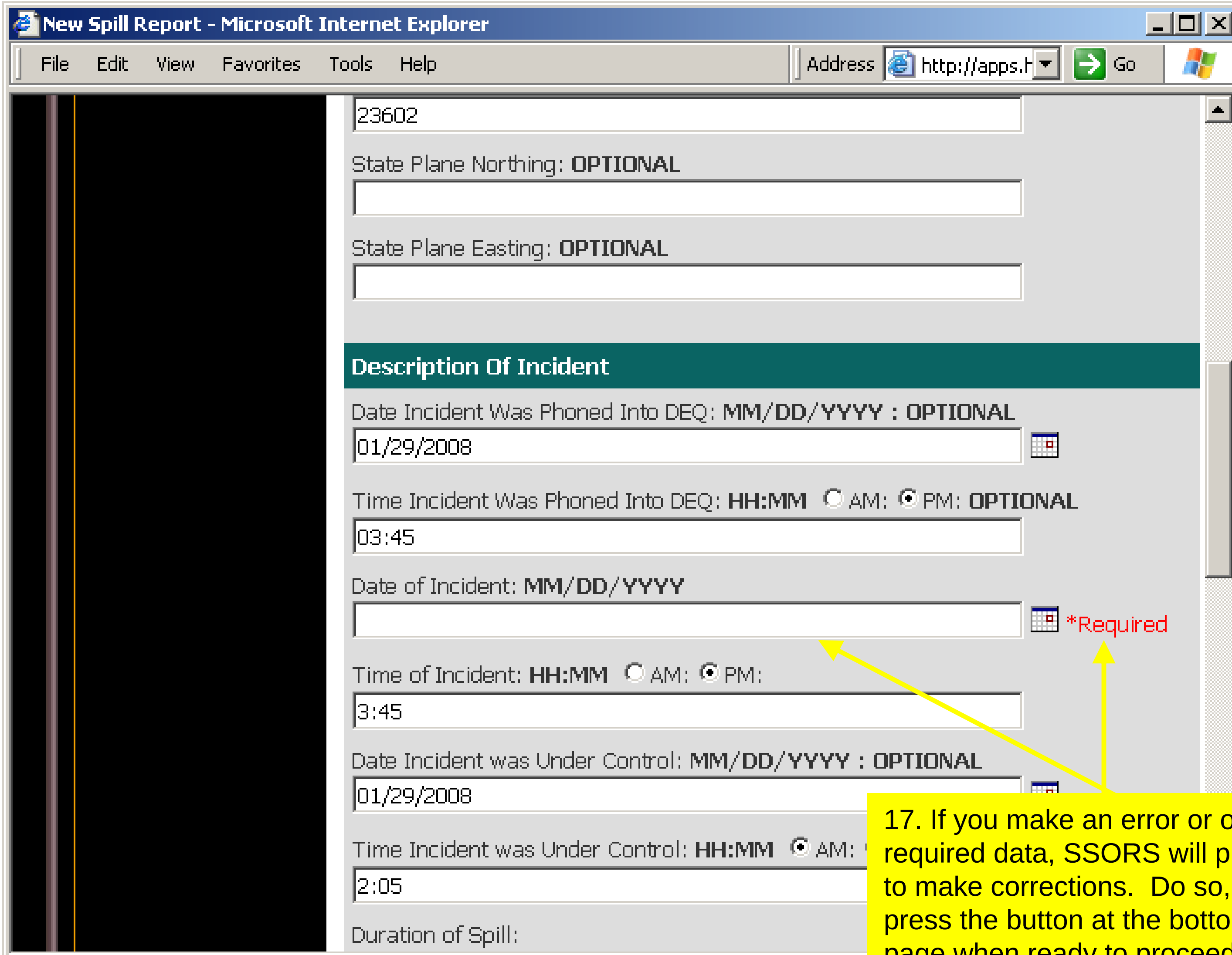
14. The units (gallons or cubic feet) may be chosen when the report is created. Once they are set here, they may not be changed later.

15. You may edit this data later on, so numbers and text can be changed later if necessary.

16. The button a the bottom of the page will let you know the next step. In this case, press the "**Preview Spill Report**" button to proceed with the initial notification process.

If the quantity is truly unknown and cannot be reasonably estimated, enter "-1" (without the quotes) for the amount. DEQ strongly prefers a "good guess" to a "-1" entry. An alert will be added to the outgoing e-mail subject line If a "-1" is entered.

Sanitary Sewer Overflow Reporting System (SSORS)
Creating a Spill Report (Initial Notification)



17. If you make an error or omit required data, SSORS will prompt you to make corrections. Do so, then press the button at the bottom of the page when ready to proceed.

Sanitary Sewer Overflow Reporting System (SSORS)

Creating a Spill Report (Initial Notification)

New Spill Report - Microsoft Internet Explorer

File Edit View Favorites Tools Help | Address http://apps.hrpdc.org/ssorsdev/CreateSpillReport.aspx | Go

- **Jurisdiction Home Page**
- **LogOut**
- **Printouts**
- Spill Report
  - **Create**
  - **View/Edit**
- **Contact Us**
- **Help**

SSORS Report

Preview Prior To Submittal

This is a preview page. Please review this information, then press the appropriate button at the bottom of this page.

SSORS ID Number: Not yet Assigned.

User Information

Reported By: Neil Peart

Address: 11832 Rock Landing Drive, Suite 306, Newport News Virginia, 23606

Phone: 757.873.0559

...ormation

Responsible Party:	City of Newport News
Spill Site Name:	Manhole at Intersection of 50th St. & Jefferson Avenue
Address/Location:	5078 Jefferson Ave.
Site Zipcode:	23602
State Plane Northing:	
State Plane Easting:	

...tion Of Incident

Date Incident Was Phoned Into DEQ:	01/29/2008 03:45 PM
Date of Incident:	01/28/2008 03:45 PM
Date Incident Under Control:	01/29/2008 2:05 AM
Spill Duration:	10 hour(s) 20 minute(s).
SSO Classification:	Maintenance-Grease
Description Of Incident:	Grease Blockage Caused SSO.
Possible Receptors / Affected Water Body:	Newmarket Creek, a tributary to James River
Description Of Material:	Raw Sewage
Amount Of Material Released:	3500
Amount of Material Recovered:	3250
Amount of Material Reaching State Waters:	250
Corrective Action Taken:	TBD

[Submit Spill Report] [I Need To Correct This Data First]

HRPDC Home | Privacy Policy | Contact | Help

18. If your data is valid, SSORS will present you with this preview screen.

At this point nothing has been submitted to the system, and no e-mails have been sent.

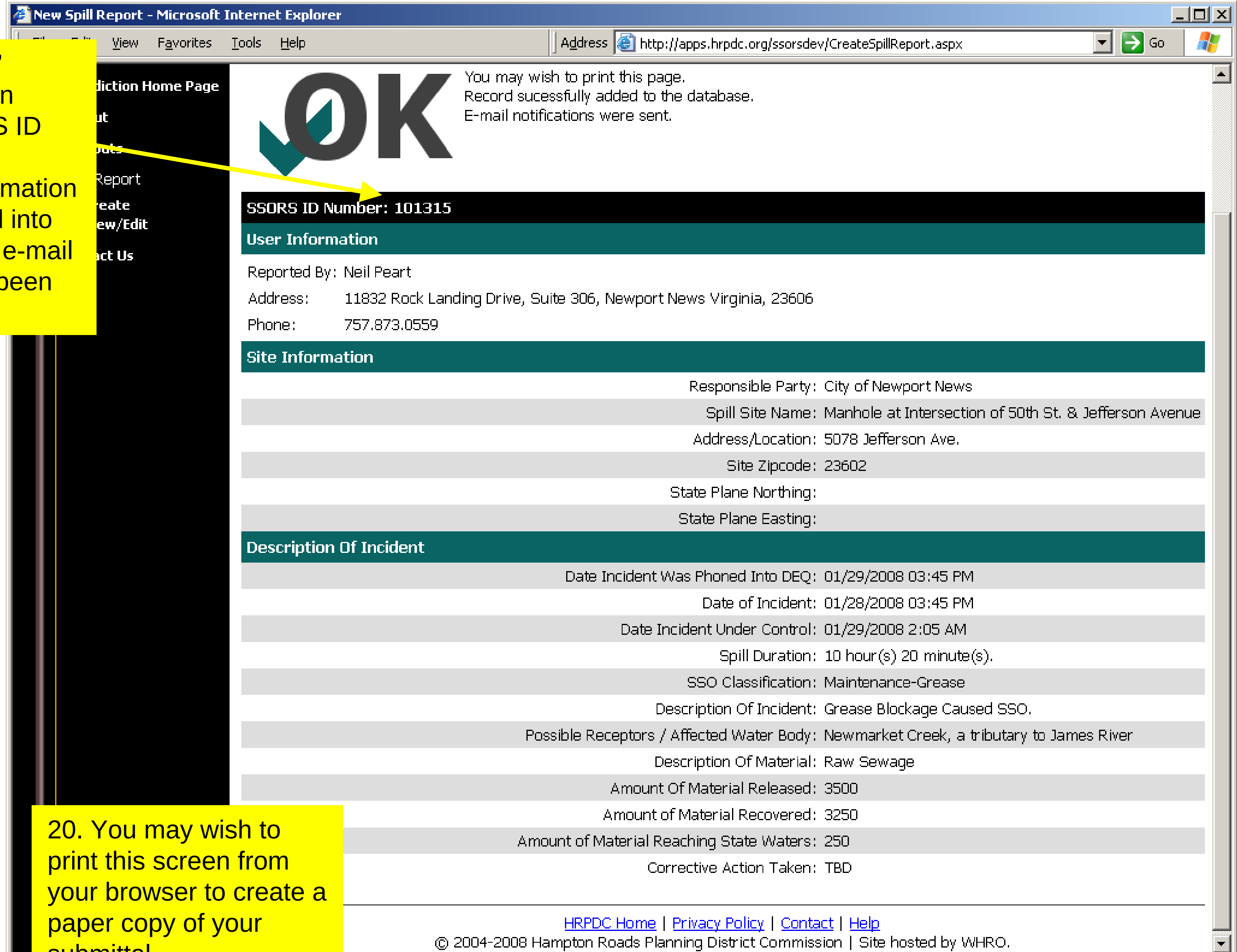
Simply review this data and click on the appropriate button to either submit the information as is, or to go back and correct the data.

Note that attachments cannot be filed with this initial report, but can be added any time after the initial report has been submitted.

Sanitary Sewer Overflow Reporting System (SSORS)

Creating a Spill Report (Initial Notification)

19. When this 'OK' confirmation screen appears, a SSORS ID Number has been assigned, the information has been recorded into the database, and e-mail notifications have been sent.



If you do not reach this 'OK' screen, your Initial or 5-Day Final submittal has not been recorded or transmitted to DEQ. Make sure you see this OK screen!

20. You may wish to print this screen from your browser to create a paper copy of your submittal.

Sanitary Sewer Overflow Reporting System (SSORS)

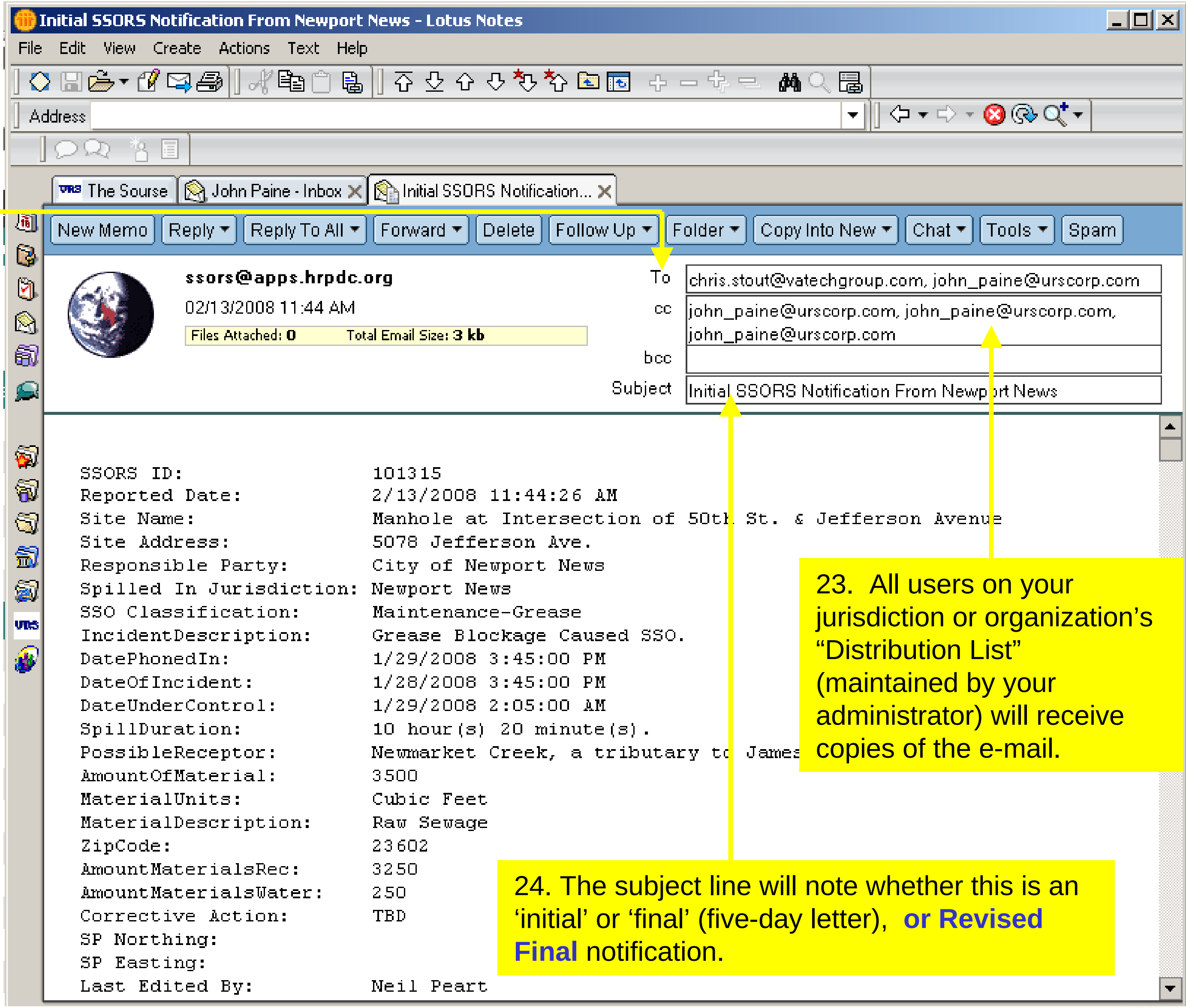
Creating a Spill Report (Initial Notification)

21. This is what a SSORS e-mail notification looks like.

22. The e-mail is sent to a list of recipients on DEQ's "Distribution List."

Only DEQ controls "To:" whom the e-mails are sent.

DEQ's distribution list includes Health Department contacts.



23. All users on your jurisdiction or organization's "Distribution List" (maintained by your administrator) will receive copies of the e-mail.

24. The subject line will note whether this is an 'initial' or 'final' (five-day letter), **or Revised Final** notification.

2008 Update

SSORS HAMPTON ROADS

Sanitary Sewer Overflow Reporting System (SSORS)
Editing a Spill Report (Updates and 5-Day Letter)

Spill Report, View/Edit

(This document explains how to submit a "Final Notification," which satisfies your 5-Day Letter requirement.)

After the initial spill report notification has been created and submitted to DEQ, users may edit the report information and save it to the SSORS database. This capability allows users to add or correct information, without submitting the information every time it is updated. In 2008 the capability to attach files (photos, PDF files, etc.) was also added to the View/Edit form.

When all the information is complete, edit the report one last time, and submit it as a final (5-day letter) report. At the time of final submittal (or upon revising a report that has already been submitted as 'Final'), e-mail notifications will be sent. Also, if you change the "Date Phoned Into DEQ," e-mails will be sent to DEQ's distribution list.

For any given incident, the SSORS ID number remains the same throughout the process.

DEQ's edit process allows them to assign or edit the IR number.

An 'Open' report is one which has not yet been submitted as 'Final'.

Sanitary Sewer Overflow Reporting System (SSORS)
Editing a Spill Report (Updates and 5-Day Letter)
(Cont.)

The "Save this Update (but do NOT Submit) " option is to merely save the updated data that you just edited. If you only save the update, the information is saved to the SSORS database <u>without sending any notifications to anyone</u> (i.e. no e-mails will go out). This option allows you to revise data until you are ready to submit a final (5-day) notification. <u>However, if you change the "Phoned Into DEQ Date" from a date/time to a different date/time, or revise a record that has already been submitted as 'Final', e-mails will be sent to DEQ's distribution list.</u>

The "Submit As Final" option submits the data as a final (5-day letter) report. When the data is processed as 'Final', a date stamp is added to the SSORS database indicating the time and date of the final submittal, and final e-mail notifications are sent out by SSORS.

DEQ or the Health Department may have some follow-up questions for you, but this process is intended to fulfill your reporting requirements. If you need to change something <u>after</u> you have sent a final submittal, simply re-edit the spill report , and re-submit it as a Final document.

Sanitary Sewer Overflow Reporting System (SSORS)
Editing a Spill Report (Updates and 5-Day Letter)

(Cont.)

Users may request that a record be stricken from the SSORS database (for example to eliminate duplicate or problematic reports, such as when a spill turns out to be a private party responsibility).

E-mail notifications will be sent to DEQ's distribution list when the final report is submitted through SSORS. E-mail copies will be sent to the sending jurisdiction/organization's distribution list. These distribution lists now include Health Department contacts. Previously there was a separate procedure where the Health Department would be notified if the spill quantity was larger than 1,000 gallons (or 133.7 cubic feet), but now the Health Department is receiving copies of the e-mail notifications for all spills, regardless of quantity.

Nothing is erased when spill report information is updated in SSORS. Every time someone updates the information, a new record is written to the SSORS database. You can use the "Printouts" features to review the complete editing history of each spill report. In other words, by requesting the history to be included in the printout, you can review who edited what, and when they did so.

Sanitary Sewer Overflow Reporting System (SSORS)
Editing a Spill Report (Updates and 5-Day Letter)

(Cont.)

To summarize, E-Mail notifications <u>will</u> be sent when:

- **User submits Initial Notification**
- **User submits Final Notification**
- **User changes "Phoned Into DEQ Date" (from a date to another date)**
- **User edits a report that has previously been submitted as 'Final'**

E-Mail notifications will <u>NOT</u> be sent when:

- **User updates information on a spill incident that has already been submitted in an "Initial Notification," but has not yet submitted as the "Final Notification"**

If a quantity is reported as a "-1" value (indicating that the user cannot make a reasonable guess as to the quantity), the subject line of the e-mail notification will include a warning to that effect.

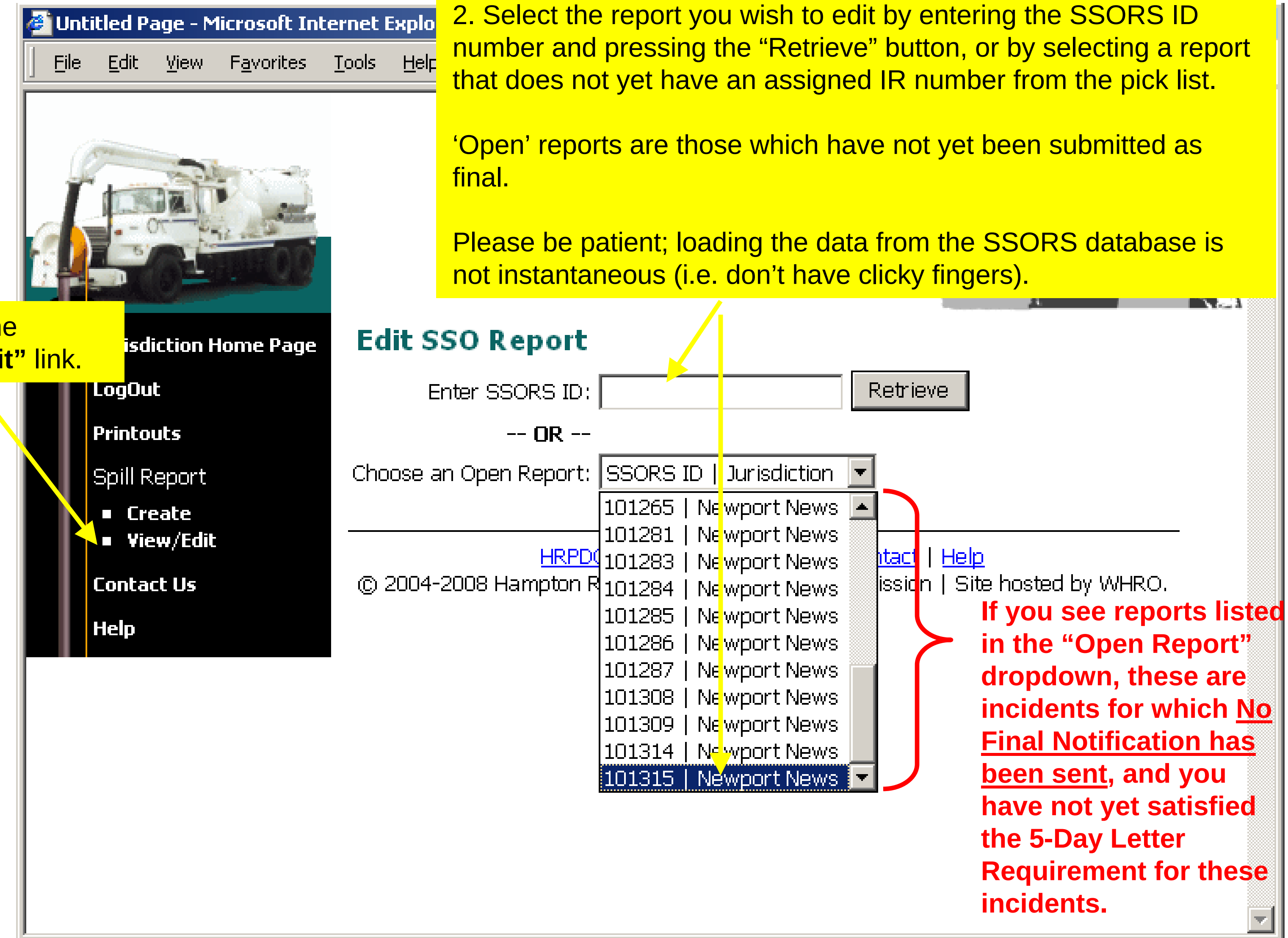
Spill Report, View/Edit

2. Select the report you wish to edit by entering the SSORS ID number and pressing the “Retrieve” button, or by selecting a report that does not yet have an assigned IR number from the pick list.

‘Open’ reports are those which have not yet been submitted as final.

Please be patient; loading the data from the SSORS database is not instantaneous (i.e. don’t have clicky fingers).

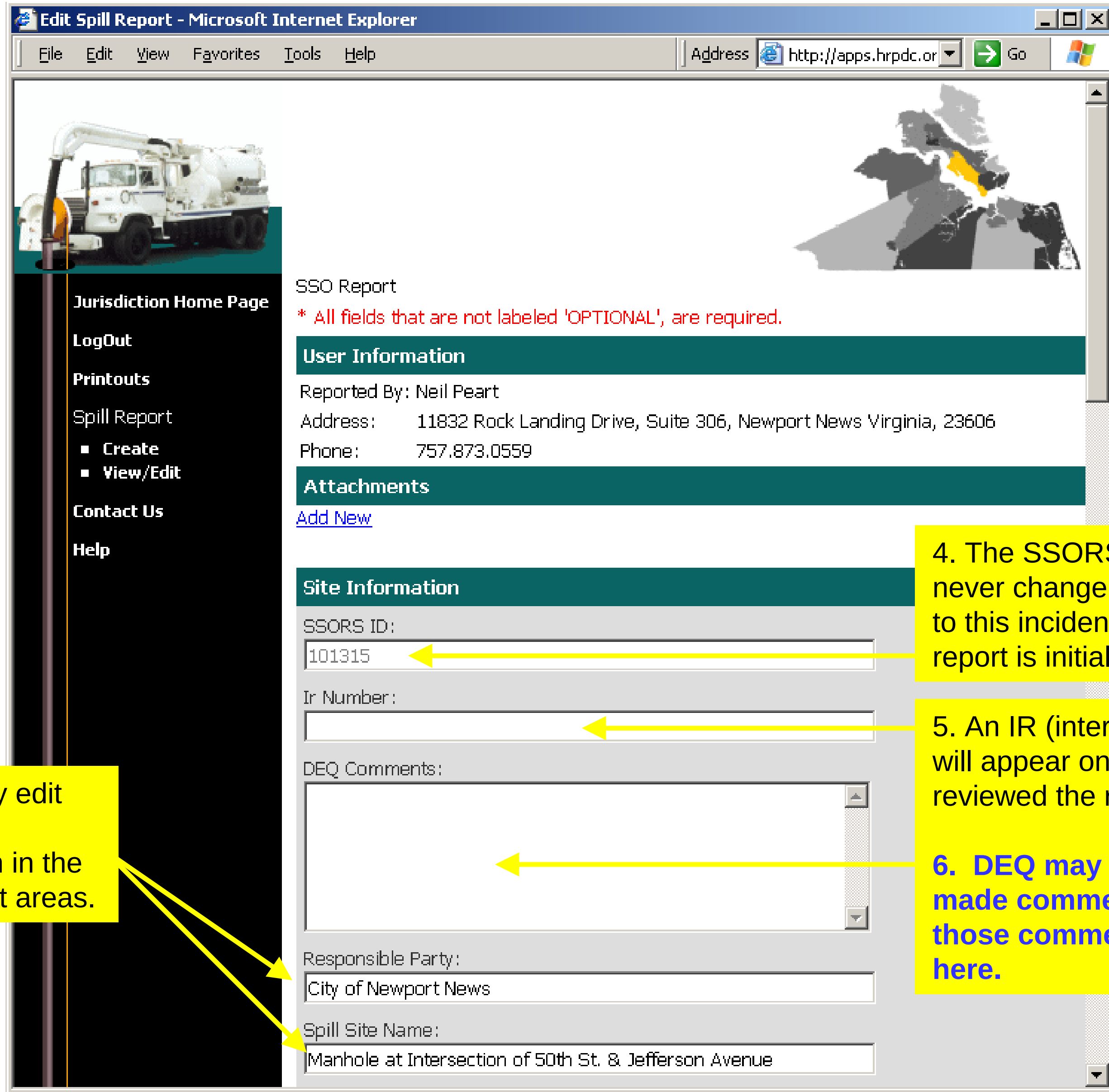
1. Click the “**View/Edit”** link.



If you see reports listed in the “Open Report” dropdown, these are incidents for which <u>No Final Notification has been sent</u>, and you have not yet satisfied the 5-Day Letter Requirement for these incidents.

Sanitary Sewer Overflow Reporting System (SSORS)

Editing a Spill Report (Updates and 5-Day Letter)



4. The SSORS ID number will never change once it is assigned to this incident (when the spill report is initially submitted).

5. An IR (internal record) number will appear only if DEQ has reviewed the report.

6. DEQ may or may not have made comments. If they have, those comments will appear here.

3. You may edit any of the information in the 'Active' text areas.

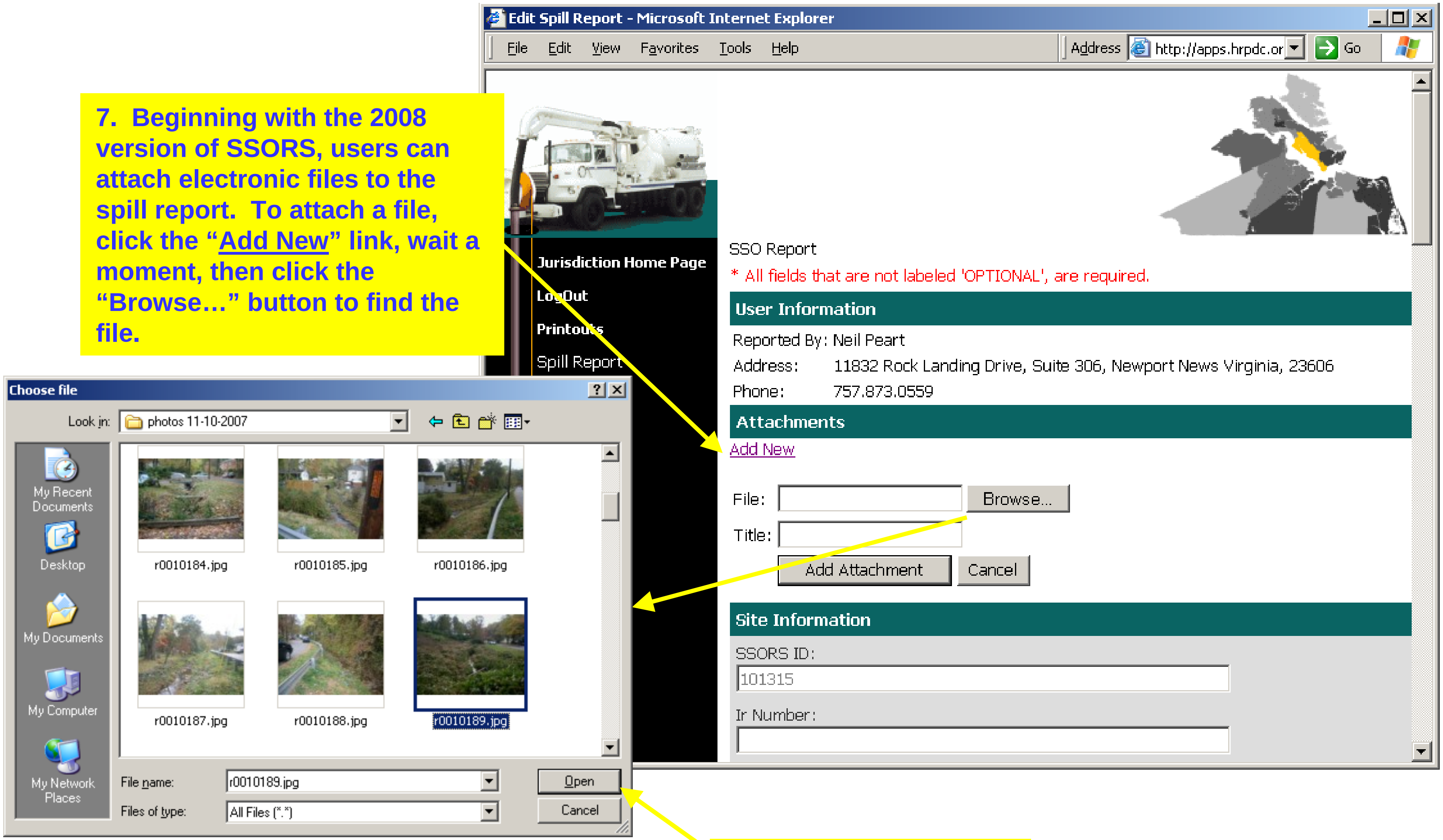
2008 Update

SSORS

Sanitary Sewer Overflow Reporting System (SSORS)

Editing a Spill Report (Updates and 5-Day Letter)

7. Beginning with the 2008 version of SSORS, users can attach electronic files to the spill report. To attach a file, click the "Add New" link, wait a moment, then click the "Browse…" button to find the file.

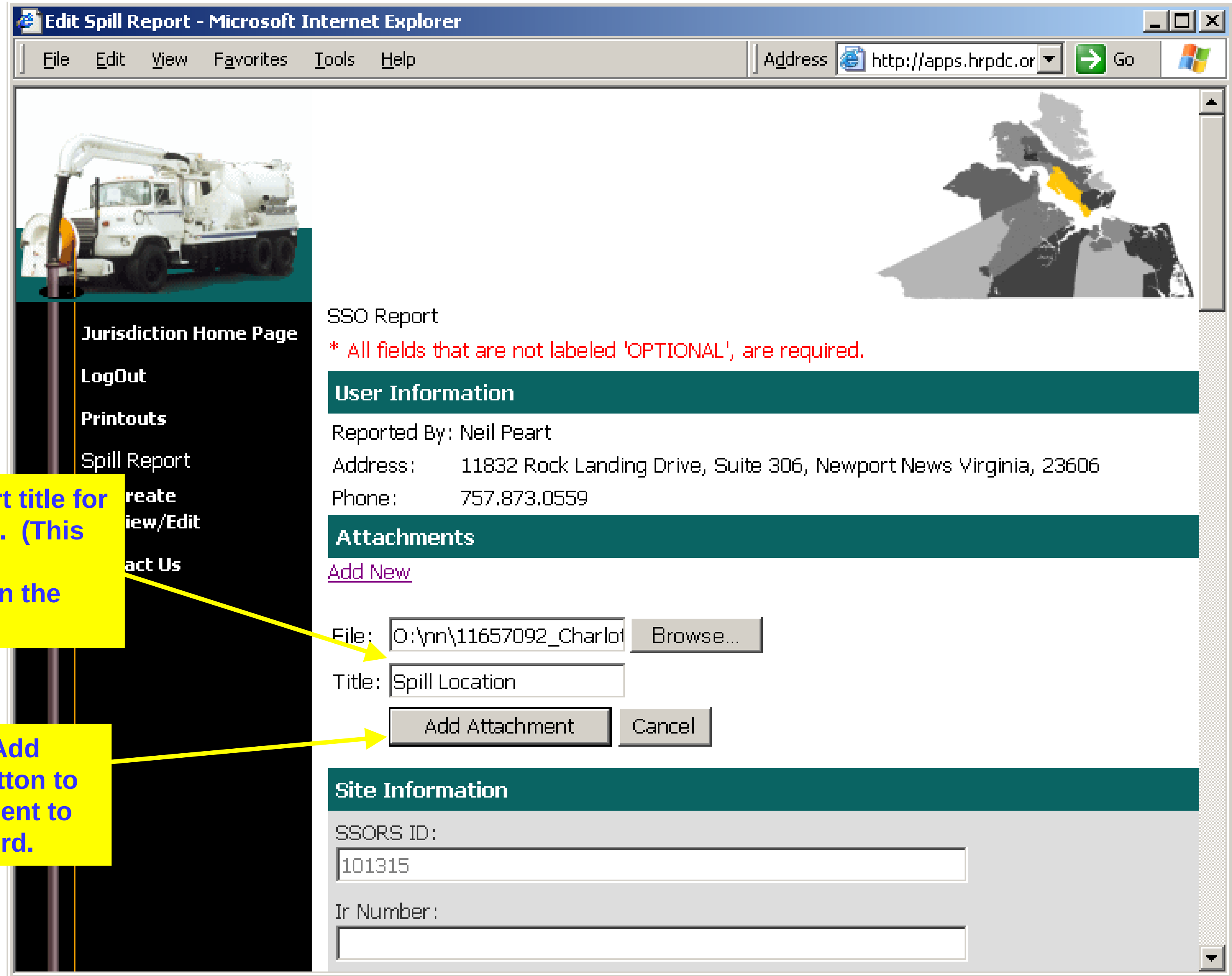


8. Press this button to reference the file.

2008 Update

Sanitary Sewer Overflow Reporting System (SSORS)

Editing a Spill Report (Updates and 5-Day Letter)

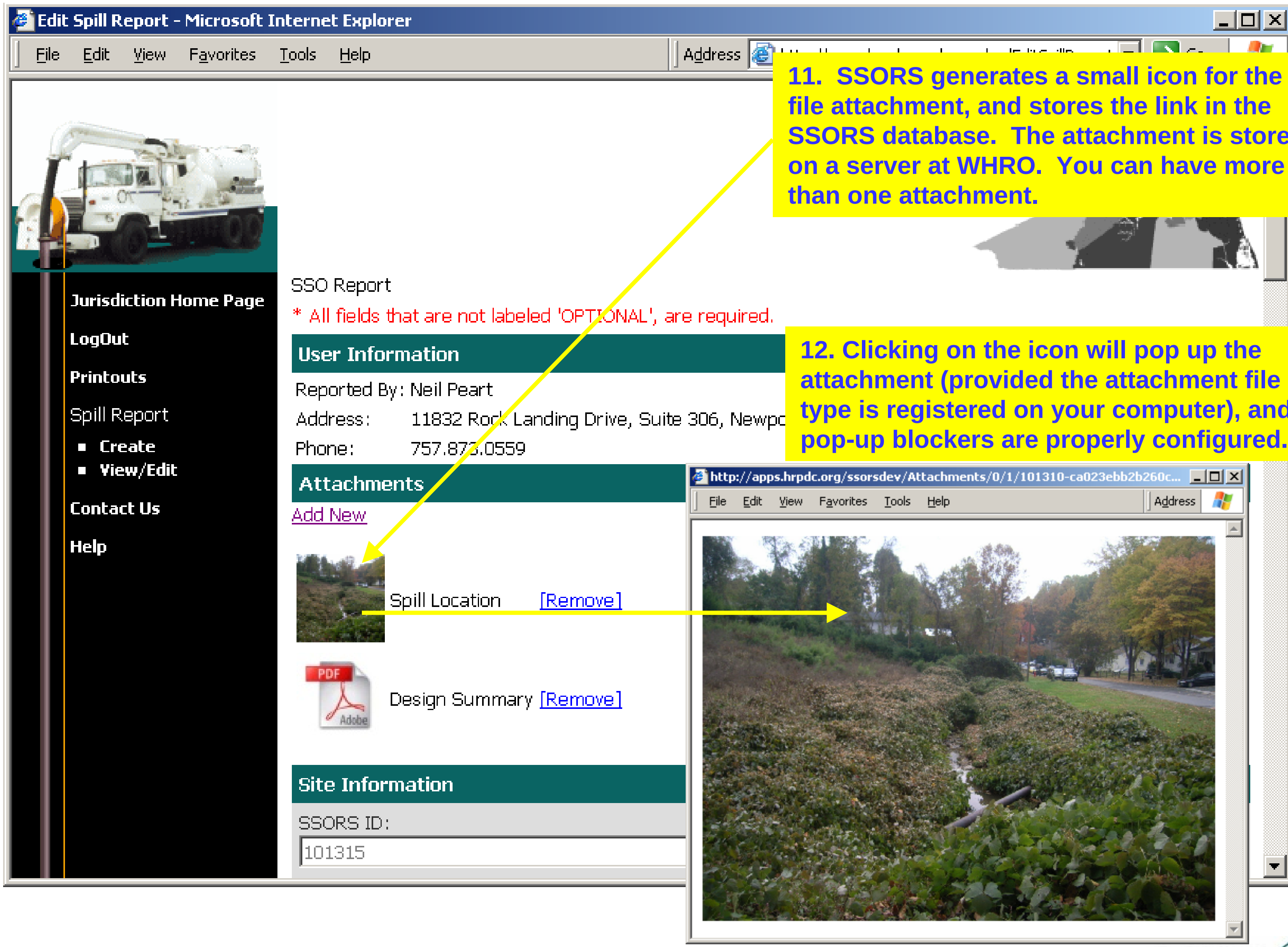


9. Enter a short title for the attachment. (This title will be the hypertext link in the printouts.)

10. Press the "Add Attachment" button to add the attachment to the SSORS record.

Sanitary Sewer Overflow Reporting System (SSORS)

Editing a Spill Report (Updates and 5-Day Letter)



11. SSORS generates a small icon for the file attachment, and stores the link in the SSORS database. The attachment is stored on a server at WHRO. You can have more than one attachment.

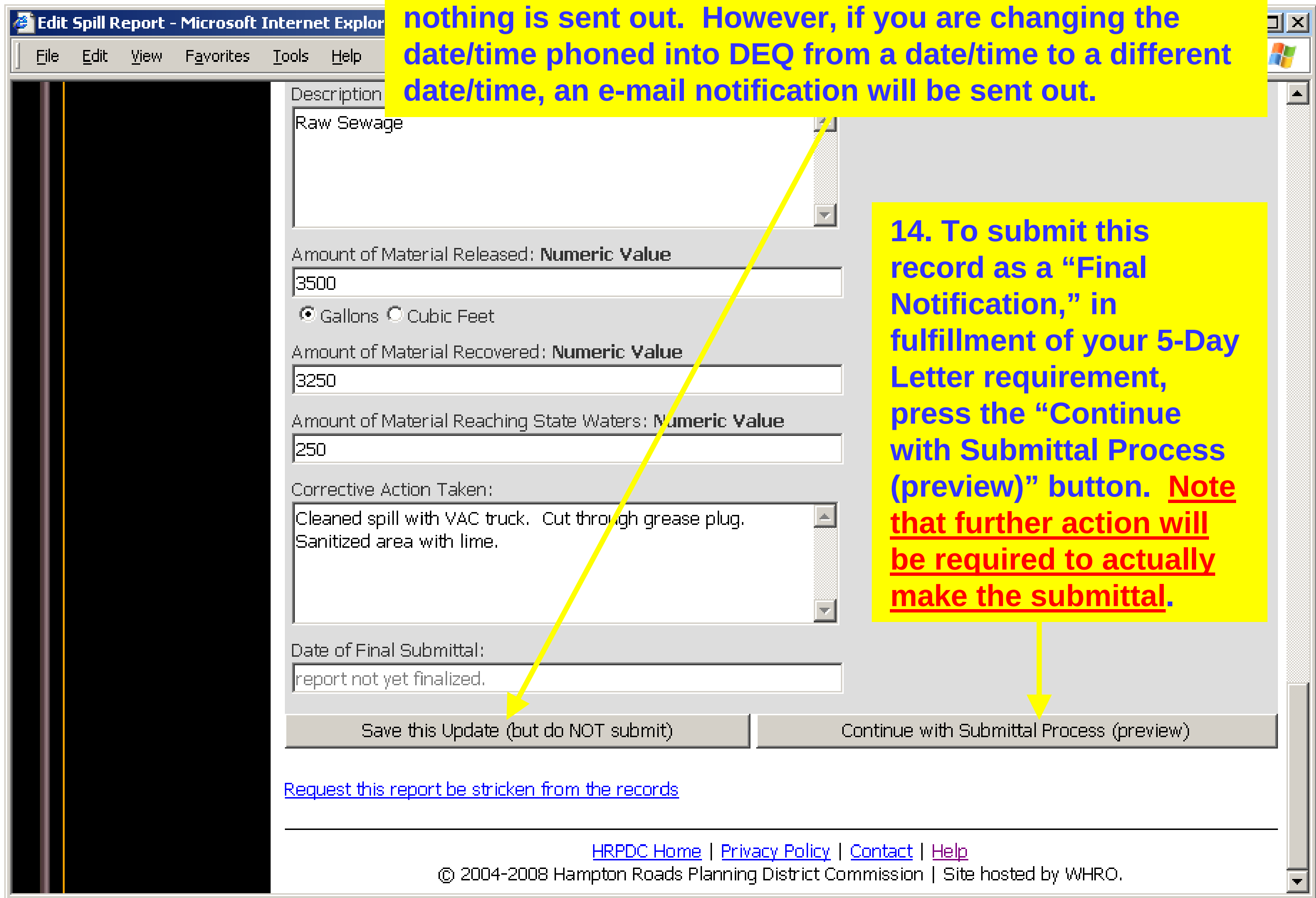
12. Clicking on the icon will pop up the attachment (provided the attachment file type is registered on your computer), and pop-up blockers are properly configured.

Sanitary Sewer Overflow Reporting System (SSORS)
Editing a Spill Report (Updates and 5-Day Letter)

<u>Save this Update (but do NOT Submit)</u> allows you to save the information to the SSORS database without submitting e-mail notifications **(unless you are revising a record previously submitted as 'Final', or changing the date/time phoned into DEQ from a date/time to a different date/time)**. The status of the incident report remains as before, unless you are revising a report that was previously submitted as 'Final'.

<u>Continue with Submittal Process (preview)</u> takes you to a preview page from which you may submit this data to fulfill your 5-day letter requirement.

13. After editing any active data, press the "Save this Update (but do NOT Submit)" button to save the edits. If the incident has previously been submitted to DEQ as 'Final', you will be taken to a preview page. Otherwise the data is merely updated in the SSORS database and nothing is sent out. However, if you are changing the date/time phoned into DEQ from a date/time to a different date/time, an e-mail notification will be sent out.

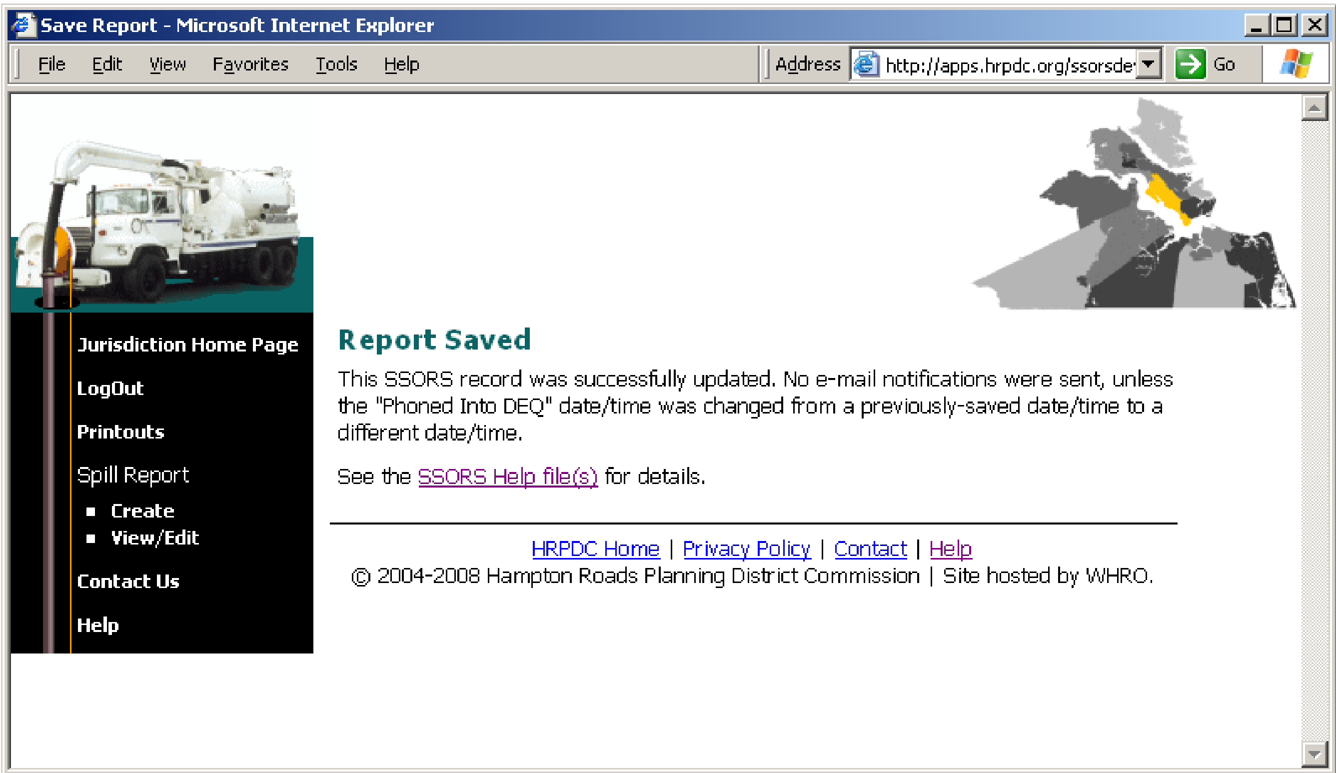


14. To submit this record as a "Final Notification," in fulfillment of your 5-Day Letter requirement, press the "Continue with Submittal Process (preview)" button. <u>Note that further action will be required to actually make the submittal</u>.

2008 Update

Sanitary Sewer Overflow Reporting System (SSORS)
Editing a Spill Report (Updates and 5-Day Letter)

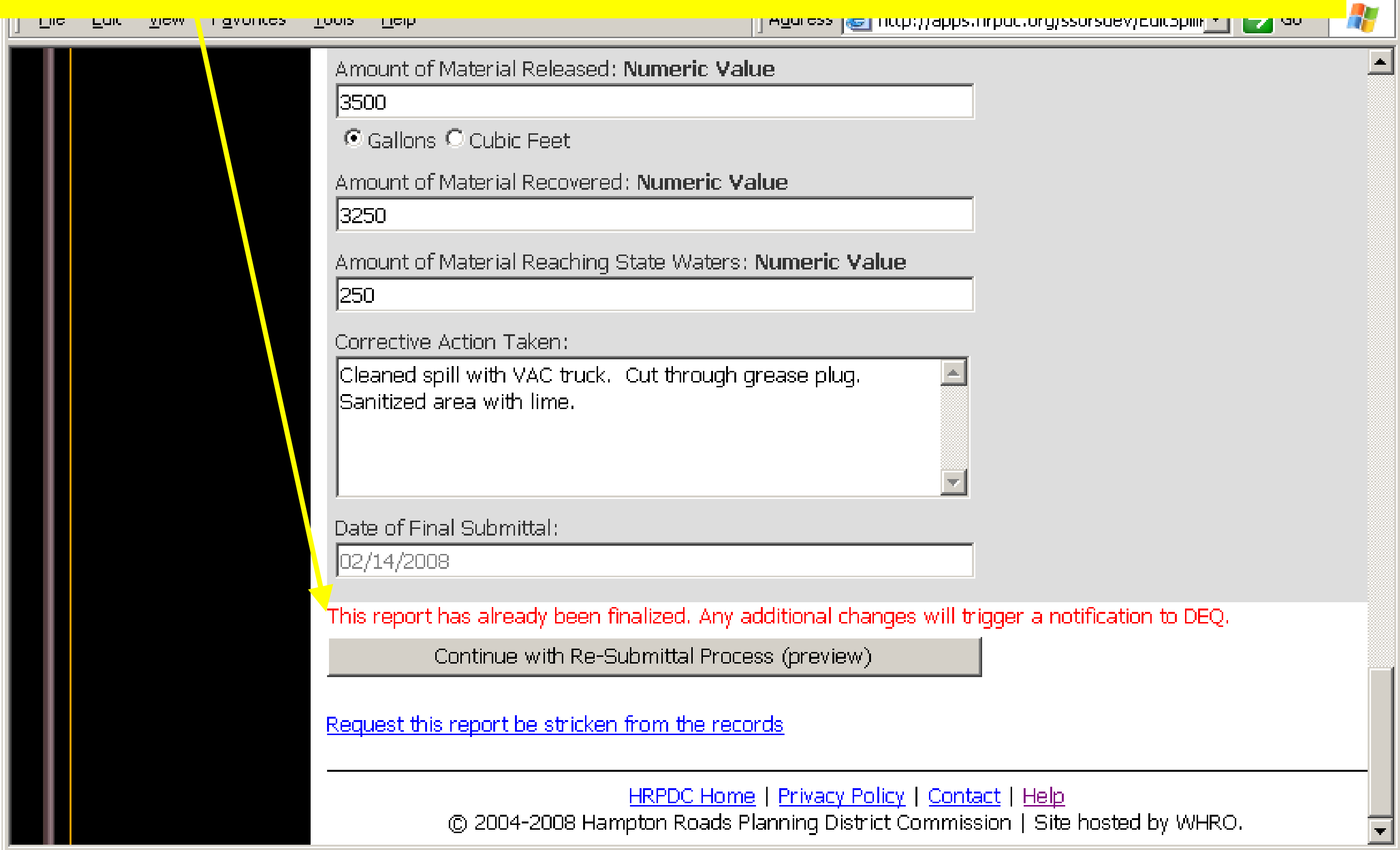
15. If you are just updating this incident record—and it has not yet been submitted as 'Final' to DEQ—this is the confirmation page you will receive after pressing the "Save this Update (but do NOT Submit)" button. (If it has been previously submitted as a Final record, you will be taken instead to a preview screen.)



Sanitary Sewer Overflow Reporting System (SSORS)

Editing a Spill Report (Updates and 5-Day Letter)

16. _If_ you were updating a record that had previously been submitted as 'Final', the bottom of your edit page would note that situation. Press the "Continue with Re-Submittal Process (preview)" button to proceed to the preview screen. This message is not intended to discourage you from re-submitting the record. There are times when you should re-submit, such as when you find out that previously submitted information was incorrect or deficient.

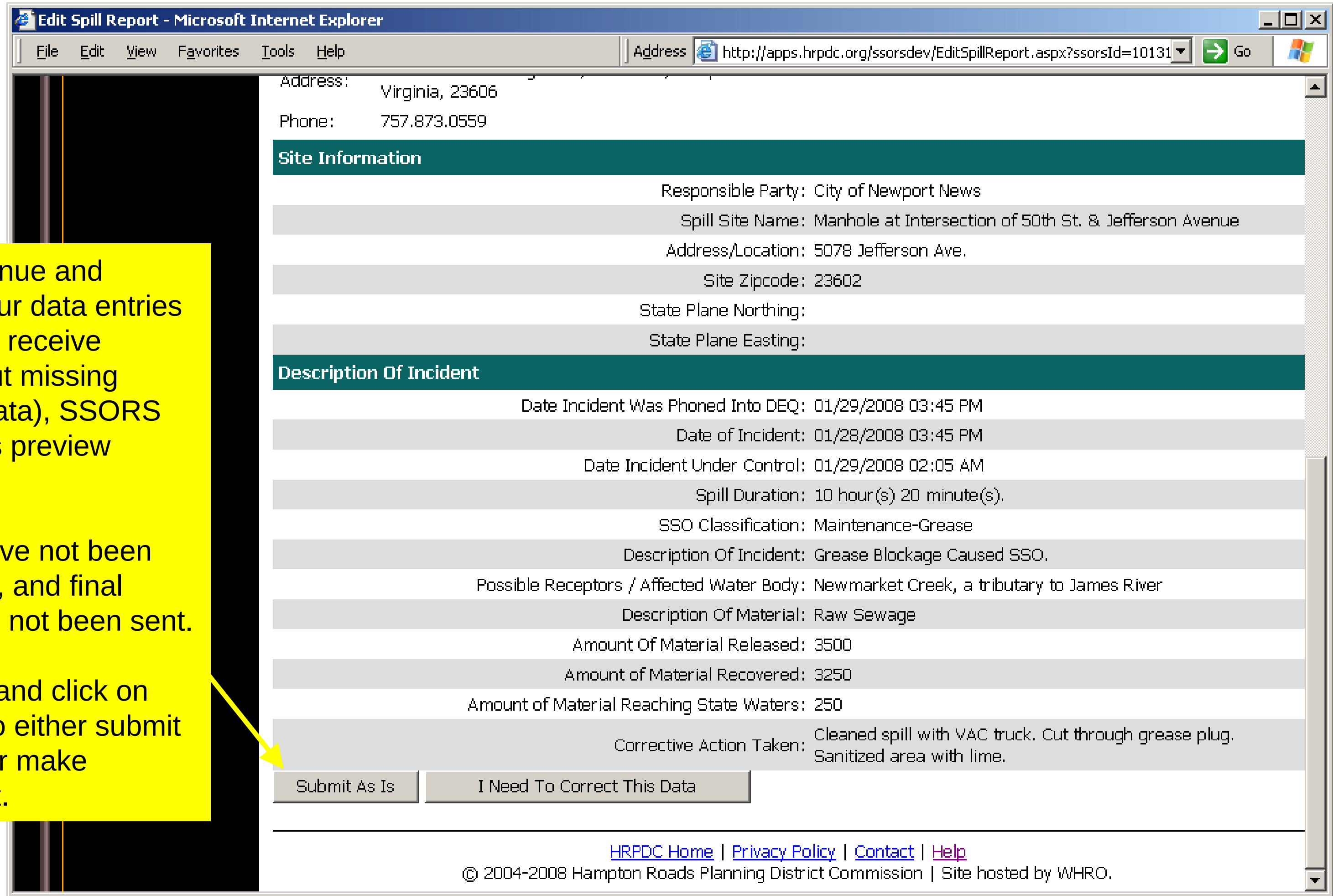


Sanitary Sewer Overflow Reporting System (SSORS)
Editing a Spill Report (Updates and 5-Day Letter)

17. If you intend to continue and submit this data, and your data entries are valid (i.e. you do not receive warning messages about missing required or erroneous data), SSORS will present you with this preview screen.

At this point the edits have not been submitted to the system, and final notification e-mails have not been sent.

Simply review this data and click on the appropriate button to either submit the information "As Is" or make corrections to this report.



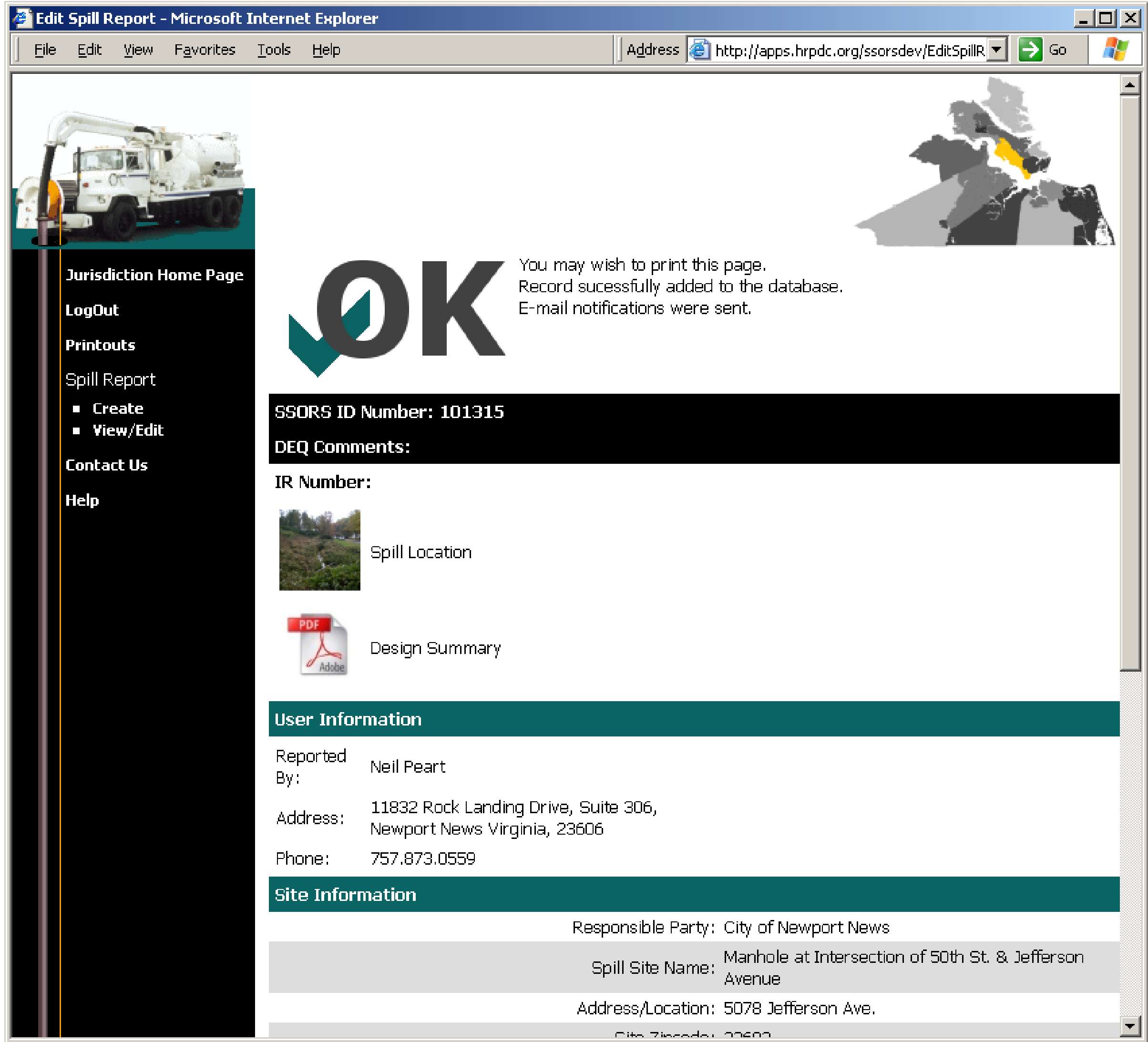
Sanitary Sewer Overflow Reporting System (SSORS)

Editing a Spill Report (Updates and 5-Day Letter)

18. When this 'OK' confirmation screen appears, the edited information has been recorded into the database, and final e-mail notifications have been sent.

If you do not reach this 'OK' screen, your Initial or 5-Day Final submittal has not been recorded or transmitted to DEQ. Make sure you see this OK screen!

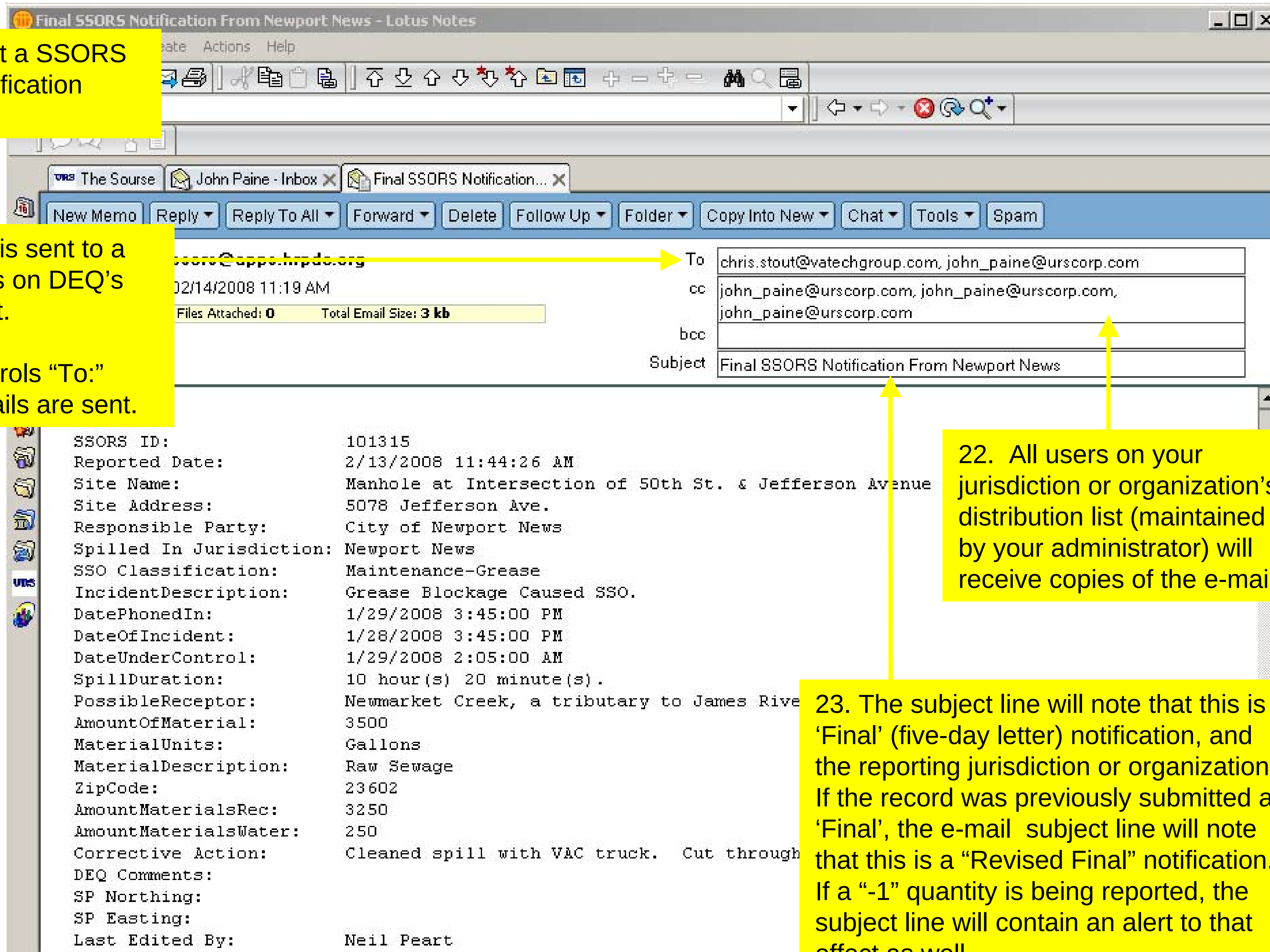
19. You may wish to print this screen from your browser to create a paper copy of your final submittal.



Sanitary Sewer Overflow Reporting System (SSORS)

Editing a Spill Report (Updates and 5-Day Letter)

20. This is what a SSORS final e-mail notification looks like.



21. The e-mail is sent to a list of recipients on DEQ's Distribution List.

Only DEQ controls "To:" whom the e-mails are sent.

22. All users on your jurisdiction or organization's distribution list (maintained by your administrator) will receive copies of the e-mail.

23. The subject line will note that this is a 'Final' (five-day letter) notification, and the reporting jurisdiction or organization. If the record was previously submitted as 'Final', the e-mail subject line will note that this is a "Revised Final" notification. If a "-1" quantity is being reported, the subject line will contain an alert to that effect as well.

Sanitary Sewer Overflow Reporting System (SSORS)

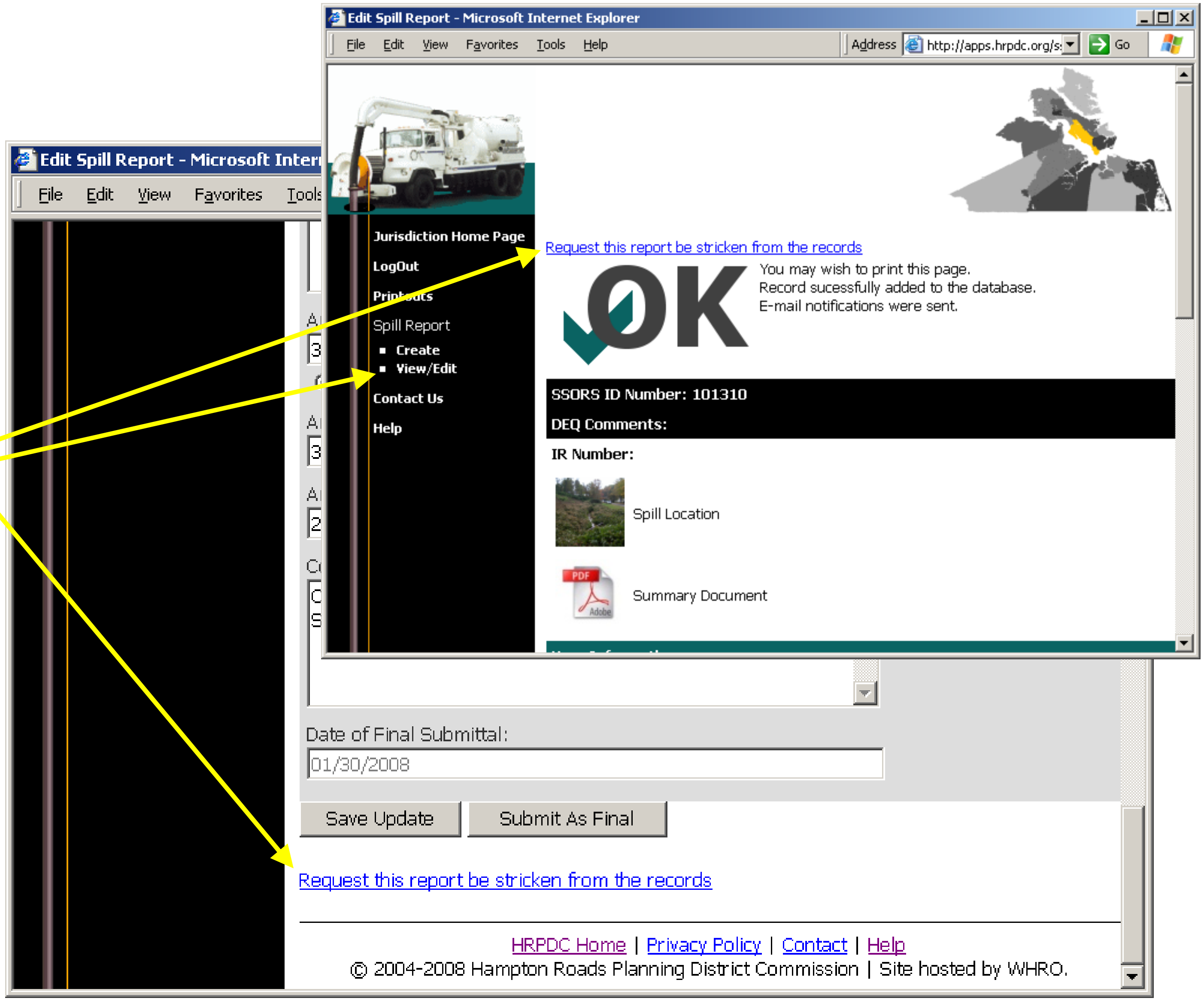
Editing a Spill Report (Updates and 5-Day Letter)

24. Users may request that a record be stricken from the SSORS database (for example to eliminate duplicate or problematic reports, such as when a spill turns out to be a private party responsibility).

To make such a request, click on the "<u>Request this report to be stricken from the records</u>" link. This link may appear in several different places. One easy way to find it is to click the "View/Edi" menu link, and scroll to the bottom of the page.

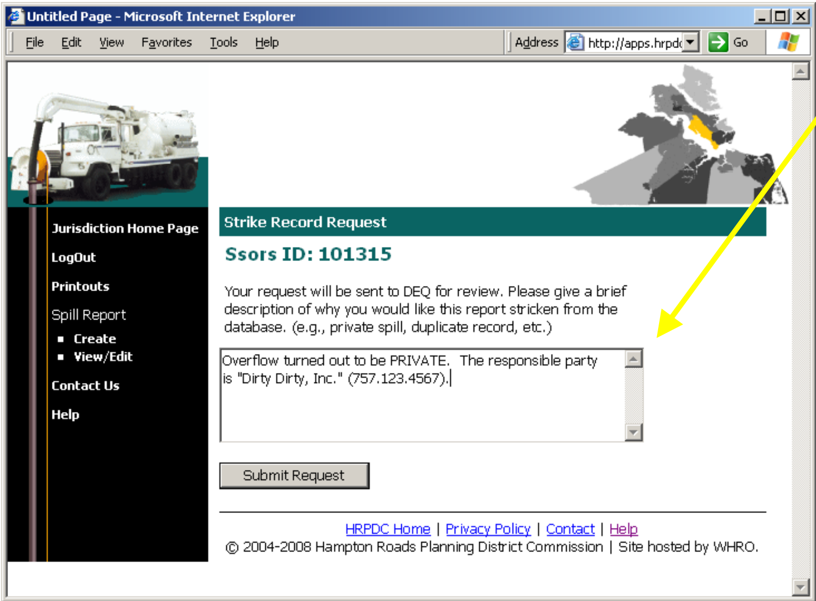
Stricken records do not show up in future printouts, unless specifically requested.

Only DEQ can strike a record.



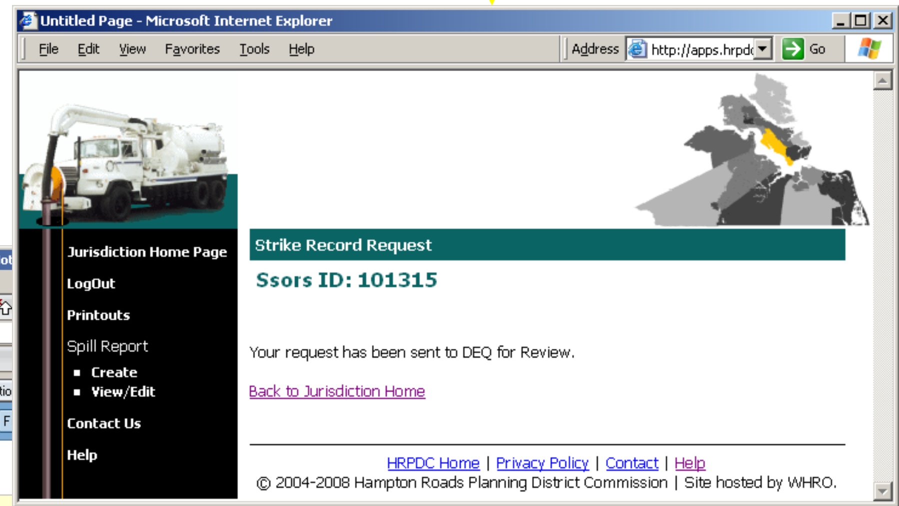
Sanitary Sewer Overflow Reporting System (SSORS)

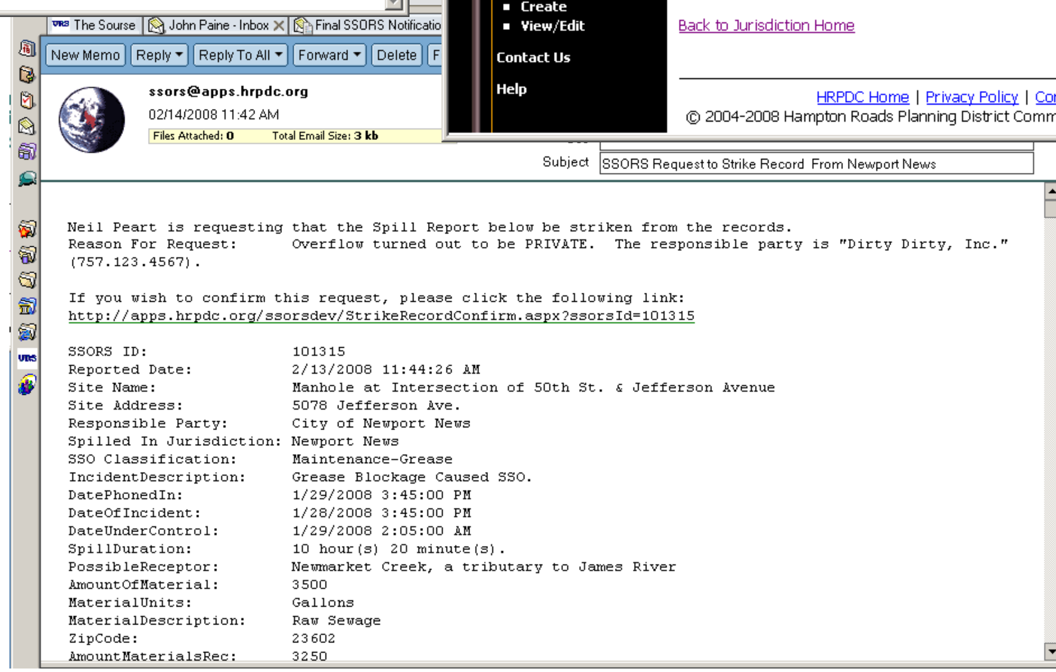
Editing a Spill Report (Updates and 5-Day Letter)



25. A Strike Record Request screen will appear. Simply state the reason for the request, and press the "Submit Request" button to send the request by e-mail to DEQ.

A confirmation screen will appear after the e-mail has been sent to DEQ.





2008 Update

SSORS

APPENDIX C: NON-HRSD SSO REPORTING PROCEDURES

Reporting Procedures for Non-HRSD SSOs during Business Hours

When an HRSD employee observes a possible SSO that does not involve the HRSD system, the following must be done:

- HRSD's Responsible Person shall contact the appropriate Operations Center and report.
- The Interceptors Operations Center shall make every reasonable attempt to contact the owner of the sewer facility where the event is occurring.
- When an HRSD employee observes a possible SSO that does not involve the HRSD system, the following must be recorded:
    - Location of Release: Street Address, City, Map page and Grid number
    - Type of Problem (manhole overflow, air vent, etc.)
    - Date and Time Potential SSO was discovered
    - Owner of the sewer facility, if known.

Reporting Procedures for Non-HRSD SSOs during Non-Business Hours

- HRSD's Responsible Person shall make every attempt to determine the owner of the sewer facility at the site of the possible SSO and contact them.

NON-HRSD SYSTEM REPORTING FORM

A. ADDRESS ____

CITY ____

MAP PAGE ______ GRID NUMBER ______________

B. PERSON REPORTING ____

C. TYPE OF PROBLEM

____

____

____

D. DATE AND TIME PROBLEM DISCOVERED __________________________

E. WAS THE CITY OR THE LINE OWNER NOTIFIED? ____________________________

IF YES, GIVE DATE & TIME OF NOTIFICATION ________________________

PERSON CONTACTED ____

CONTACT PHONE NUMBER ____

CONTACT EMAIL ____

COMMENTS ____

____

____

____

____

APPENDIX D: DOOR HANGER

Our HRSD professionals have responded to a release of wastewater that occurred on or near your property. They have removed as much of the release as possible and cleaned the area. A small amount of lime, a natural soil conditioner, has been placed on the soil to reduce odors.

We are often asked if precautions are necessary after we complete our work. Here are a few general guidelines:

- Children and pets should avoid the spill area until it has dried.
- Practice good hygiene. It's always a good idea to wash your hands with clean water and soap before handling food and after playing or working in your yard.
- If you have a garden, over the next few days thoroughly wash any fruits or vegetables you pick before eating them.
- Wastewater is not corrosive and will not cause damage to property such as cars, buildings, fences, shrubs, or lawns.
- If your home uses a well for drinking water, please call the number below so we can determine whether precautions are necessary.

Our professionals have attended to the failure in the sewer system, and your normal household activities such as laundry and bathing may continue uninterrupted.

If you have any questions, please call us at 757-460-7056.

TO BETTER SERVE YOU

Date______________________________

HAMPTON ROADS SANITATION DISTRICT

HRSD employees will be working in your neighborhood within the next few days. We may need to enter your property to:

- ☐ Inspect sewer lines
- ☐ Clean sewer lines
- ☐ Repair sewer lines
- ☐ Other

____

____

____

____

We will do our best to accomplish our work quickly and with as little disruption as possible. If you have any questions or concerns please call:

____

____

____

APPENDIX E: EQUIPMENT LIST

The following table provides a typical listing of equipment that HRSD maintains available for responding to SSOs. The list is not inclusive or expected to be required, but is the typical equipment available.

Emergency Response Equipment List

Emergency Equipment Available	Equipment
Jet flushing unit	Television camera unit
Vactor Unit	Truck with hoist
Standard disinfectants	Vactor unit
Truck with hoist	Power saw (circular)
	Pipe cutter (hydraulic)
Safety Equipment	Caution tape
Air blower with hose	Bucket with rope
Safety cones/barricades	Portable pumps
Air Detector – for oxygen deficient, explosive or toxic gases	Assorted hand tools (i.e., screwdrivers, wrenches, hammers, brooms)
Confined space entry tripod and associated equipment	Portable generators
Personal Protective Equipment (PPE)	Power vacuum
Safety harness and lifeline if applicable	Bypass pumping equipment
Flashlight	Assorted hand mirrors
	Aluminum ladder
	Trash pumps may be required

APPENDIX F: COMPREHENSIVE PHONE DIRECTORY

The following phone directories are included in this Appendix:
HRSD's Emergency Notification
Locality Emergency Notification
DEQ Emergency Notification

PUBLIC INFORMATION TELEPHONE LIST

Name	Title	Contact Information	
Nancy Munnikhuysen	Chief of Public Information	Office Cell Phone	757-460-7058 757-642-1321

INTERCEPTOR SYSTEMS TELEPHONE LIST

Name	Title	Contact Information	
David Waltrip	Director of Operations	Office	757-460-4223
Karen Harr	Chief of South Shore Interceptors	Office Cell Phone	757-360-4211 757-374-9238
Chris Stephan	Chief of North Shore Interceptors	Office Cell Phone	757-833-1739 757-777-7511
Jay Bernas	Chief of Planning and Analysis	Office Cell Phone	757-318-4335 757-374-9236
Gene Rutledge	Interceptor Engineer, South Shore	Office Cell Phone	757-318-4338 757-284-7222
Bambos Charalambous	Interceptor Engineer, South Shore	Office Cell Phone	757-460-7015 757-374-1758
Ryan Brewster	Interceptor Engineer, North Shore	Office Cell Phone	757-833-1729 757-284-5771

NORTH SHORE INTERCEPTORS TELEPHONE LIST

Name	Title	Contact Information	
Don Butler	Superintendent Interceptor	Office Cell phone	833-1723 613-6596
Eric Jackson	Chief Foreman System	Office Cell phone	833-1724 613-6597
Stan Saunders	Pump Station Supervisor	Office Cell phone	833-1725 613-6598
Kenny Pierce	System Supervisor	Office Cell phone	833-1726 613-6599
	Duty Supervisor	Office	613-6600
	Operations Coordinator	Office	833-1720

SOUTH SHORE INTERCEPTORS TELEPHONE LIST

Name	Title	Contact Information	
John Wade	Superintendent Mentor	Office Cell phone	460-7070 284-8101
Mike Mundy	Superintendent Interceptors	Office Cell phone	460-7077 284-8102
Ron Corby	Superintendent Collections	Office Cell phone	460-7071 284-8103
	Duty Supervisor	Office	284-8118
	Operations Coordinator	Office	460-7072

TECHNICAL SERVICES TELEPHONE LIST

Name	Title	Contact Information	
Dan Barker	Environmental Scientist	Office Home	460-4247 412-7212
Mark Feltner	Environmental Scientist	Office Home	460-4254 410-3180
Will Hunley	Environmental Scientist	Office Home	460-4252 482-9917
Kevin Parker	Environmental Scientist	Office Home	460-4244 962-9394
Jamie Mitchell	Environmental Scientist	Office Home	460-4220 538-0553
Sharon Nicklas	Permits Manager	Office Home	460-4245 340-8119
Jim Pletl	Chief of Technical Services	Office Home	460-4246 365-4208

For after-hours emergencies or if you are having trouble locating a member of TSD, call the TSD cell phone:

757-510-8035

If you are not contacted within 15 minutes of leaving a Voicemail message, then use the phone list. It is important that you talk directly with someone on the list. **Do not leave a message on their answering machine or with a relative/roommate!** Continue calling numbers on the list until you reach a TSD person.

REGULATORY AGENCY TELEPHONE LIST

DEQ-Virginia Beach Office.....................757-518-2077

Department of Emergency Services

Use for reporting during non-business hours......1-800-468-8892

NORTH SHORE LOCALITIES EMERGENCY TELEPHONE LIST

LOCALITY	OFFICE	CELL	OTHER
YORK COUNTY			
ON CALL (PS & F/M)		876-8807	
ON CALL (GRAVITY LINES)		876-8817	
Bret Cowan (Ops Sup)	890-3797	876-8806	
Daryl Ballard (GRAVITY LINES)	890-3895	876-8815	
Brian Woodward (CHIEF OF UTILITIES)	890-3241	592-6776	
EMERGENCY DISPATCH	890-3603		
WORK HOUR DISPATCH	890-3752		
GLOUCESTER COUNTY			
Arnie Francis (SUPT.)	804-693-4044	804-815-1618	
AFTER HOURS DISPATCH (SHERIFF)	804-693-3890		
CITY OF POQUOSON			
Bob Speechley (SUPERVISOR)	868-3594	876-0463	872-1432
Mike Snapp	868-3505	812-5381	872-1894
Public Works	868-3590		
AFTER HOURS DISPATCH (POLICE)	868-3501		
CITY OF NEWPORT NEWS			
Steve Land (Administrator)	269-2751	592-7352	
Chris Alston (Retired Consultant)	269-2753		
Marc Kuykendell (Ops Supt.)	269-2766	592-7353	
Andy Belvin (PS Ops Supv.)	269-2768	592-3966	
Wastewater Dispatch	269-2750		
ON CALL CELL PHONE		592-2771	
AFTER HOURS	269-2700		
CITY OF HAMPTON			
Jason Mitchell (Ops Manager)	726-2950	876-2120	
Donnel Gray (Construction Manager)	726-2901	810-9330	
Barry Dobbins (I & I Manager)	726-2944	810-4397	
Jerry Surrett	726-8408	876-7709	
ON CALL PS MECHANIC		810-4502	931-0220
COLLEGE OF WILLIAM & MARY			

LOCALITY	OFFICE	CELL	OTHER
Facilities Management Office	757-221-2270		
EMERGENCY & AFTER HOURS - CAMPUS POLICE	757-221-4596		
VIMS GLOUCESTER			
Mike Kershner (ENGINEER)	804-684-7013	804-642-7912	757-877-0409
EMERGENCY / AFTER HOURS (Security)		804-694-7300	
CITY OF WILLIAMSBURG			
Paul Reiser (SUPERVISOR)	757-220-6233	757-846-8531	
John Stevens (LOCATOR)	757-220-6233	757-810-7716	757-870-3167
Moe Pruneau (PS SUPVR)	757-220-6232	757-814-1405	757-882-0324
Emergency Number	757-220-6196		
JAMES CITY SERVICE AUTHORITY			
George Adams (OPERATIONS)	757-259-4100	757-592-0081	
Bill Harris (PS SUPV.)	757-259-4095	757-592-6785	
Danny Poe	757-253-6810	757-592-2321	
Tom Ebert (Underground)	757-259-4097	757-592-6791	
DISPATCH (DAY)	757-229-7421		
DISPATCH (NIGHT)	757-566-0112		
LANGLEY AFB			
Carmicheal Patton - Manager Erosion Environment	764-3987/ 3906	846-3688	
Jeree Grimes - Water Program Manager	764-3987/ 3906		
Service Call	764-5342 / 5343		
Emergency - Fire Station	764-4222		
Mr. Franken (Waste Water Foreman)	757-764-2877 / 764-6168		
NAVAL WEAPONS STATIONS			
Public Works Dept. (Dispatch)	445-6868		
James Michener-Water/Sewer Eng	887-4291	636-4084	
FORT EUSTIS			
Susan Miller	878-4123 Ext 302	757-880-6749	
AFTER HOURS EMERGENCY	878-4357		
CAMP PEARY			
Jennifer Davis (Environmental Manager)	757-229-2121 Ext 4263		
Scott Florence (Public Works Dept.)	757-229-2121 Ext 2200		
AFTER HOURS	757-229-2121		
CHEATHAM ANNEX			

LOCALITY	OFFICE	CELL	OTHER
Public Works Duty Desk	757-887-7373		
YORK RIVER COAST GUARD BASE			
Mr. Rodriguez (Facilities Engineering)	856-2215		
OFFICER OF THE DAY (24 hrs.)	856-2354		
BASE SECURITY (24 hrs.)	856-2314		
VIRGINIA POWER			
FORT EUSTIS	878-5225		
VERIZON			
DISPATCH (LOW WIRES, POLES)	757-875-2710		
VERIZON UTILITIES (Bob Huffman)	757-810-1595	757-810-9051	
ANHEUSER BUSCH INC.			
Jeff Osterloh (Resident Eng)	253-3691		
BUSCH GARDENS			
Greg Thacker (Maintenance)	757-253-3406	757-897-6387	
Larry Vaughn	757-253-3426	757-897-3426	
John Vaughn (Utilities)	757-253-3429	757-897-6388	
Patrick Henry Market Shopping Center			
Main Office	249-2338		
Security	249-9107	810-6201	
GREAT WOLF LODGE			
Tom Nealey - Operations Supervisor	757-229-9700	757-784-0647	

SOUTH SHORE LOCALITIES EMERGENCY TELEPHONE LIST

Locality	Phone	Hours/Comments
Miss Utility		
Chesapeake	382-6352	normal working hours 8:30 a.m. through 5 p.m.
Norfolk	823-1000	normal working hours 7 a.m. through 3:30 p.m.
Portsmouth	393-8561	normal working hours 7:30 a.m. through 4 p.m.
Suffolk	514-7000	normal working hours 8:30 a.m. through 5 p.m.
Virginia Beach	385-1409	normal working hours 7 a.m. through 5 p.m.
Permits		
Chesapeake	382-6018	normal working hours 8:30 a.m. through 5 p.m.
Norfolk	664-6565	normal working hours 7 a.m. through 3:30 p.m.
Portsmouth	393-8531	normal working hours 7:30 a.m. through 4 p.m.
Suffolk	514-4150	normal working hours 8:30 a.m. through 5 p.m.
Virginia Beach	385-4211	normal working hours 7 a.m. through 5 p.m.
Public Utilities - Sewer/Water		
Chesapeake	382-3400	normal working hours 8:30 a.m. through 5 p.m. after hours 382-3550
Norfolk	823-1000	normal working hours 7 a.m. through 3:30 p.m. 24 hour #
Portsmouth	393-8561	normal working hours 7:30 a.m. through 4 p.m. 24 hour #
Suffolk	514-7000	normal working hours 8:30 a.m. through 5 p.m. after hours 514-7034
Virginia Beach	385-4631	normal working hours 7 a.m. through 5 p.m. 24 hour #
Traffic		
Chesapeake	382-6177	normal working hours 8:30 a.m. through 5 p.m.
Norfolk	441-5818	normal working hours 7 a.m. through 3:30 p.m.
Portsmouth	393-8594	normal working hours 7:30 a.m. through 4 p.m.
Suffolk	925-1654	normal working hours 8:30 a.m. through 5 p.m./ Signals 238-2834, Signs 925-2665
Virginia Beach	385-1409	normal working hours 7 a.m. through 5 p.m.
Miscellaneous Numbers		
Little Creek Amp Base		cell 462-7071, pager 682-6787
Dominion Virginia Power		866-591-0157 - remember to give station acct # when reporting power outage
Colonial Pipeline		800-926-2728
Columbia Gas		800-835-7191, 800-543-8911
Virginia Natural Gas		466-5500
Cox Communications		224-1111, MU 222-6566, Evenings/Weekends 222-3530

APPENDIX G: DEFINITIONS

This section includes basic definitions of a sanitary sewer system and sanitary sewer overflow, which gives readers an overview to help understand the sections of this document.

Ad hoc Action Committee (AAC) shall mean a selection of HRSD staff identified by the HRSD Directors to address SSOs and generate action plans. Representatives on the AAC will likely be from Interceptor Systems (Operations and Interceptor Engineers), Engineering (Planning and Analysis), and Water Quality.

Building/Private Property Backups shall mean any release of wastewater from HRSD's sanitary sewer system into buildings or onto private property, except a release that: (1) is the result of blockages, flow conditions, or malfunctions of a building lateral or other piping/conveyance system that is not owned or operated by HRSD, or (2) is the result of overland, surface flooding not emanating from HRSD's Sanitary Sewer System.

Capacity related overflow shall mean an SSO that occurs when the actual wastewater flow exceeds the hydraulic capacity of the collection system. Capacity related overflows **cannot** be resolved through modified maintenance activities. Capacity related overflows are SSOs **not** caused by grease, roots, structural defects (i.e., sags, off-set joints, loss of round, etc.), debris, and equipment or power failures.

CCTV shall mean closed-circuit television.

Collection System shall mean the sewage collection and transmission system (including all pipes, force mains, gravity sewer lines, lift stations, pumping stations, manholes, and appurtenances thereto) owned or operated by HRSD and designed to convey wastewater to any treatment plant (TP).

Force Main shall mean any pipe that receives and conveys, under pressure, wastewater from the discharge side of a pump. A Force Main is intended to convey wastewater under pressure.

GIS shall mean Geographic Information System.

Gravity Sewer Line shall mean a pipe that receives, contains and conveys wastewater not normally under pressure, but is intended to flow under the influence of gravity.

Locality or Localities is typically defined in the ongoing regulatory actions as the cities of Chesapeake, Hampton, Newport News, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg; the counties of Gloucester, Isle of Wight, James City, and York; and the town of Smithfield. For the purposes of this document, the term shall include any city, county, town, or other municipal wastewater service provider in the HRSD service area.

HRSD shall mean Hampton Roads Sanitation District, a political subdivision created by a 1940 Act of the General Assembly of Virginia and charged with the responsibility to provide sewage collection, conveyance, and treatment services for the communities in the Hampton Roads metropolitan area.

Infiltration shall mean water other than wastewater that enters a sewer system (including sewer service connections) from the ground through such means as defective pipes, pipe joints, connections, or manhole walls. Infiltration does not include, and is distinguished from, inflow.

Inflow shall mean water other than wastewater that enters a sewer system (including sewer service connections) from sources such as, but not limited to, roof leaders, cellar drains, yard drains, area drains, drains from springs and swampy areas, manhole covers, cleanouts, cross connections between storm sewers and sanitary sewers, catch basins, cooling towers, storm waters, surface runoff, street wash waters, or drainage. Inflow does not include, and is distinguished from, infiltration.

Inflow/Infiltration (I/I) shall mean the total quantity of water from Inflow, Infiltration, and Rainfall-Induced Infiltration without distinguishing the source.

Interceptor Sewer shall mean a sewer, typically without individual sewer customer connections, that is used to collect and carry flows from main and trunk sewers to a central point for treatment and discharge.

Non-District SSO is defined as an SSO which the discharge is from facilities privately owned or owned by a Locality.

Private Property shall mean land that is owned by a private entity.

Private Service Connection/Lateral shall mean that portion of the collection system used to convey wastewater from a building or buildings to that portion of the sanitary sewer system owned by the Locality or HRSD.

Pumping Station shall mean facilities comprised of pumps that lift wastewater to a point physically higher than the wastewater elevation in the wet well or into a pressurized force main, including all related electrical, mechanical, and structural systems necessary to the operation of that pumping station.

Recurring SSO shall mean an SSO that occurs more than once within the previous 5 years at the same location caused by the same problem.

Regional Sanitary Sewer System shall mean the collective sanitary sewer systems owned and operated by the localities, as well as the HRSD sanitary sewer system including gravity sewer lines, manholes, pump stations, lift stations, pressure reducing stations, force mains, wastewater treatment plants, and all associated appurtenances.

Regulatory Reporting Form (RRF) shall mean the initial document used by HRSD to record information related to SSOs. This information is largely stored in HRSD's SSO Database.

Reportable Sanitary Sewer Overflow (SSO) shall mean the unauthorized intentional or unintentional spill, release, or discharge to waters of the State or United States of untreated wastewater from any portion of a sanitary sewer system before the headworks of a wastewater treatment facility.

Resolved SSO shall mean an SSO that has a distinct solution which has been implemented, so as to limit the possibility of a Recurring SSO.

Sanitary Sewer Overflow (SSO) shall mean an overflow, spill, diversion, or release of wastewater from or caused by the Regional Sanitary Sewer (SS) System. This term shall include: (i) discharges to waters of the State or United States from the Regional SS System and (ii) any release of wastewater from the Regional SS System to public or private property that does not reach waters of the United States or the State, including Building/Private Property Backups.

Sanitary Sewer Discharge (SSD) shall mean any discharge to waters of the State or the United States from the HRSD Sanitary Sewer System through a point source not authorized in any Permit.

SSORS shall mean the Sanitary Sewer Overflow Reporting System administered by the Hampton Roads Planning District Commission for SSOs in the Tidewater Region. This is an online database system accessible through the Internet.

Sanitary Sewer System shall mean the wastewater collection and transmission system that is comprised of all portions of the individual Hampton Roads locality or HRSD collection systems, including manholes, gravity sewers and force mains, lift stations, pump stations, and associated appurtenances. Building sewer laterals are not considered part of the Locality's sanitary sewer system.

Sewer Basin shall mean all portions of the sanitary sewer system tributary to an interceptor sewer or pump station (also referred to as a pump station service area). Generally, the sewers within a sewer basin are hydraulically linked.

Supervisory Control and Data Acquisition (SCADA) shall mean a computer system for gathering and analyzing real time data.

Surface Water shall mean waters of the State and United States as defined in 40 CFR 122.2.

VDEQ shall mean the Department of Environmental Quality, an agency of the Commonwealth of Virginia as described in Code § 10.1-1183.

HRSD
Cleaning wastewater every day for a better Bay.

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