

**City of Baltimore**  
Department of Public Works (DPW)

**Modified Consent Decree (MCD)  
Revised Emergency Response Plan (ERP)**

Sanitary Sewer Overflow Consent Decree  
Civil Action No. JFM-02-1524

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## 1.0 INTRODUCTION AND OVERVIEW

### 1.1 Introduction

#### 1.1.1 Purpose

The City of Baltimore (“the City” or “Baltimore City”) is operating its Wastewater Collection System under the terms of an MCD with the U.S. Environmental Protection Agency (EPA) and the Maryland Department of the Environment (MDE). Paragraph 16, Revised ERP, of the MCD requires the City to submit a revised ERP to adequately protect the health and welfare of persons in the event of an unpermitted release, spill, or discharge of pollutants from the Collection System or in the event of a reported Building Backup.

The ERP is a reference tool to be used by City personnel during a wastewater emergency situation or reported Building Backup. It describes procedures to be followed in response to wastewater overflows within the Collection System. Pertinent response and notification procedures are outlined in this ERP, which has been developed to meet the MCD’s Paragraph 16 requirements. Based on the sensitivity of utility operations and impact of providing critical infrastructure information available to the public, supplemental information will be developed for City personnel use during a wastewater emergency.

#### 1.1.2 Goals

The primary goal of the ERP is to protect the health and welfare of City residents in the event of a discharge of pollutants from the Collection System. Other goals include minimization of adverse effects on the environment and protection of public health and private property. It is the intent of this ERP to provide clear guidance for:

- Locating and eliminating the source of the overflow in a timely manner
- Notifying impacted City agencies and departments, the general public, media outlets, and regulatory agencies

The City will review the ERP on an annual basis and update the Plan as necessary. Each annual update of the ERP will be subject to EPA and MDE approval as specified in Paragraph 20, and upon EPA and MDE approval, will be incorporated into, and become enforceable under, the MCD. The City will maintain a copy of the ERP required by this Paragraph on its intranet and provide a hard copy to City managers at each location designated in Section 8.0, Document Control.

Table A provides a checklist for the MCD requirements along with a reference for where in this document the requirement is met.

**Table A: ERP MCD Requirement Checklist**

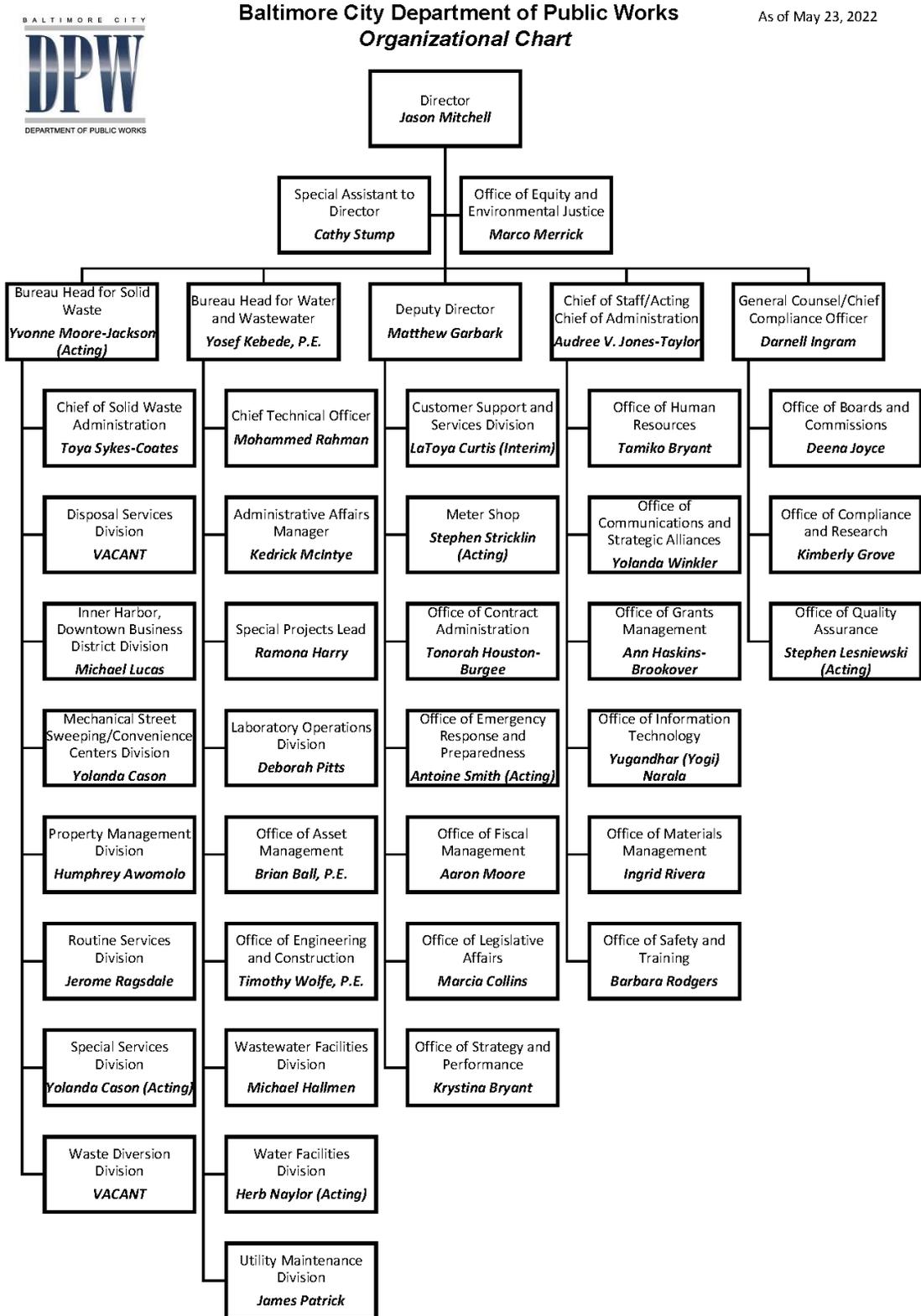
| MCD Ref.    | MCD Requirement   | ERP Plan Discussion Location                       |
|-------------|---|--|
| 16.a.(i)    | A detailed description of the actions the City will undertake to immediately provide notice to the public (through the local news media, online, and/or through other means) of the unpermitted discharge of pollutants from the wastewater treatment and Collection System | Section 4.0, Collection System SSOs                |
| 16.a.(ii)   | A detailed description of the actions Baltimore will undertake to provide notice to the public of Sanitary Discharges of Unknown Origin (SDUOs), including information on location, volumes, affected water bodies, and the impact on water quality.                        | Section 3.0, SDUO Notification                     |
| 16.a.(iii)  | A detailed description of the actions the City will undertake to provide notice to EPA, MDE, state and local public health services, and other appropriate federal, state, and local agencies   | Section 4.0, Collection System SSOs                |
| 16.a.(iv)   | A detailed plan (including the development of response standard operating procedures) to minimize the volume of untreated wastewater discharged to surface waters and to minimize overflow volumes  | Section 4.0, Collection System SSOs                |
| 16.a.(v)    | Identification of the personnel and resources that will be made available by the City to correct or repair the condition causing or contributing to the unpermitted release, spill, or discharge  | Section 4.0, Collection System SSOs                |
| 16.a.(vi)   | A plan to ensure the preparedness, including responsiveness training of City employees, contractors, and personnel of other affected City agencies necessary for the effective implementation of the ERP  | Section 7.0, Preparedness Training                 |
| 16.a.(vii)  | A detailed monitoring, sampling, analysis and reporting plan to determine if receiving water bodies have been adversely impacted by the discharge of wastewater associated with an overflow event   | Section 6.0, Water Quality Sampling and Monitoring |
| 16.a.(viii) | A plan for the implementation of institutional controls and actions to advise the public of, and limit access to and contact with, waterways, ground surfaces and resources affected by overflows from the City's Collection System   | Section 4.0, Collection System SSOs                |

| MCD Ref.    | MCD Requirement  | ERP Plan Discussion Location   |
|-------------|--|--|
| 16.a.(ix)   | Identification of overflow locations within the sewershed served by each Pumping Station and those locations at which an SSO is likely to occur first in the event of failure for each Pumping Station                                     | Section 5.0, Pumping Station Overflows                               |
| 16.a.(x)    | A list of locations that overflow regularly during wet weather events and of chronic SDUOs, and procedures for posting of temporary Sanitary Sewer Overflow (SSO) notification signs to advise the public of such overflows and discharges | Section 3.0, SDUO Notification<br>Section 4.0 Collection System SSOs |
| 16.a. (xi)  | A detailed plan describing the standard operating procedures the City will have in place and follow in order to track, identify, respond to and relieve Building Backups as soon as possible   | Section 2.0, Building Backups  |
| 16.a. (xii) | Detailed description of actions the City will take to educate public through various media regarding Building Backups  | Section 2.0, Building Backups  |
| 16.c.       | The City will maintain a copy of the revised ERP at each of its Pumping Stations   | Section 8.0, Document Control  |

### 1.1.3 Organization

The City DPW oversees the implementation of the MCD. Within DPW are 18 separate administrative divisions, offices, and bureaus. Figure 1-1 presents an organizational chart for the DPW.

**Figure 1-1: DPW Organizational Chart**



## 2.0 BUILDING BACKUPS

The DPW Utility Maintenance Division (UMD) is the first responder to investigate and address sewage backups that are reported to the City. Sewage backups may have multiple causes, including, but not limited to, blockages, defects, or flow conditions in private plumbing, private laterals, Collection System laterals, or Collection System mainlines. The City investigates all reported sewage backups, but the City's responsibility is limited to addressing Building Backups caused by verified issues in the Collection System. These issues are addressed by internal resources or through on-call contracts with outside contractors to handle emergency projects and overflow activities. These contracts are administered by the DPW Office of Engineering and Construction (OEC) and Office of Asset Management (OAM), and may be used to supplement UMD's resources and capabilities, as needed. In addition to addressing Building Backups, the City performs education and outreach services to customers regarding sewage backups.

### 2.1 Investigation Procedures

The City investigates reported sewage backups through UMD, which is under the Bureau of Water and Wastewater (BWW). Sewage backups may be reported to the City through the 311 non-emergency system ("311 System"). The 311 System is a central call network that is available via telephone (311) and online 24 hours a day, seven days a week for customers to initiate sewer-related Service Requests (SRs). Each complaint in the 311 System is assigned an SR number to track the complaint from entry into the 311 System until the SR is resolved.

Sewage backup SRs are automatically forwarded from the 311 System to the Cityworks Computerized Maintenance Management System (CMMS). Upon receipt of the SR through CMMS, DPW's Control One Office ("Control One") reviews the SR and contacts a UMD supervisor to assign a UMD Investigator ("Investigator") to investigate the SR. Once assigned, the SR is investigated as soon as possible, but in no case later than 48 hours after receipt of the SR by CMMS. The City's normal response time should be within 24 hours. Response times may vary due to the personnel/resources available, distance from the complaint site, offsite emergencies, or unforeseen field conditions.

Upon arrival at the location of the complaint(s), the Investigator will provide the City's Sewage Backup Guide ("Guide") to the affected premises identified in the SR, or if the resident prefers, provide information on how to access the Guide on the DPW website. The Investigator will also verify if the sewage backup is a Building Backup. To qualify as a Building Backup, a sewage backup must be caused by blockages, flow conditions, or other malfunctions in the Collection System. If the investigation determines that the sanitary sewer system serving the affected premises is owned by a third party, the customer will be notified, and the SR will be referred to the appropriate entity. For example, if UMD is called to investigate a sewage backup caused by a sanitary sewer pipe owned by Baltimore County ("the County"), the City will notify the County to take appropriate action.

The Investigator will examine the Collection System mainline by checking the first downstream manhole that is closest to the affected premises. If the manhole is inaccessible or the flow is obstructed based on visual inspection, the Investigator will inspect the next downstream manhole and observe the flow. If the downstream Collection System manhole is holding water, the Investigator will check each subsequent, accessible downstream manhole until a manhole is located where the mainline is flowing freely. The area between the first manhole where the mainline is flowing freely and the closest upstream manhole holding water is the likely location of the blockage or malfunction. Once the location of the suspected mainline issue is verified, the Investigator will contact Control One to create a Work Order and notify a UMD supervisor. The Work Order will be assigned to the appropriate crew by the UMD supervisor. Mainline Work Orders are executed according to the procedures listed in Section 2.2.

If it is determined that there is no mainline blockage, the lateral of the premises identified in the SR will be inspected through the external cleanout<sup>1</sup> according to procedures listed in Section 2.3. If the external cleanout is holding water, the Investigator will contact Control One to create a Work Order and notify a UMD supervisor, who will assign the Work Order to the appropriate UMD crew. If the property does not have an external cleanout, the external cleanout is not accessible, or the external cleanout is not holding water, the Investigator will advise the customer to contact a licensed plumber to locate or install an external cleanout and clean the lateral from the building to the mainline. Once the customer has been notified, the SR will be closed.

Work Orders are generated for specific, verified issues that arise from the Collection System. Notably, multiple SRs may arise from a single, discrete issue in the Collection System. For example, a mainline blockage may result in multiple complaints in the 311 System, but only one Work Order may be generated to address the mainline blockage. If an investigation determines that multiple SRs arise from the same issue(s), the SRs will be linked with the corresponding Work Order. An SR is resolved when the problem has been corrected and all related Work Orders have been updated and closed in Cityworks.

## 2.2 Procedures for Addressing Mainline Blockages

The City implements the following procedures to address Building Backups arising from mainline blockages in the Collection System:

1. A Work Order for mainline blockage is created by Control One, received by the UMD supervisor, and assigned to the appropriate UMD crew. Once a Work Order has been assigned, the City typically responds within five hours after assignment to the appropriate crew. The response timeframe may vary depending on availability of resources, offsite emergencies, distance to the location, or extreme weather events.

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<sup>1</sup> The external cleanout is a private plumbing fixture regulated by the Building, Fire, and Related Codes of Baltimore City (Building Code). Pursuant to Section 6-101 of the Building Code, the City has adopted the International Plumbing Code (2015 Edition), including but not limited to Section 708, *et seq.*

2. Once the crew arrives at the location listed on the Work Order, an attempt will be made to inform the customer that the City has arrived to address the complaint.
3. After identifying the first downstream manhole where water is flowing freely, the crew will attempt to alleviate the upstream blockage with a jet truck and/or other resources, as necessary.
4. If the crew is unable to relieve the blockage through these methods, the crew will notify Control One to create a separate, linked (child) Work Order. This may include a Work Order to implement bypass pumping. The referral will be documented, and the new Work Order(s) will be assigned by a UMD supervisor to the appropriate UMD crew or transmitted to OEC for assignment to an on-call contractor.
5. If possible, the crew(s) will capture the debris once the blockage is removed and document the type of blockage (e.g., roots, rags, grease). The crew(s) will also document the equipment/resources used in the response.
6. Once the blockage is resolved, the crew will notify Control One to record the necessary information and create a Work Order for a Closed-Circuit Television (CCTV) inspection of the mainline. Control One will generate a Work Order for the CCTV inspection that is tagged to the original Work Order.
7. Once the CCTV crew is assigned the Work Order, the CCTV inspection will be typically conducted within 10 business days. The relevant findings from the CCTV inspection will be documented. If the CCTV inspection identifies issues that must be addressed, the CCTV crew will notify Control One to create a Work Order to address the issue(s) identified during the CCTV inspection. A UMD supervisor will assign the Work Order to the appropriate UMD crew or transmit the Work Order to OEC for assignment to an on-call contractor for resolution.
8. If the customer(s) listed in the SR(s) associated with the mainline blockage are available, the crew will notify the customer(s) that work is complete and ask the customer(s) to test the drainage by running the water.
9. Once the mainline blockage is resolved and all associated Work Orders have been performed, the Work Order(s) and associated SR(s) will be closed.

### **2.3 Procedures for Addressing Collection System Lateral Blockages**

If the Investigator determines that a Collection System lateral is experiencing a blockage, the Investigator will notify Control One to create a Work Order to address the Collection System lateral. The Work Order will be assigned to the appropriate UMD crew by a UMD supervisor. The City typically responds within five hours after the Work Order is assigned. Response times may vary based on availability of personnel/resources, offsite emergencies, distance to the location, or extreme weather events.

In the event that an acute or catastrophic failure in a Collection System lateral has caused a Building Backup, UMD will create a child Work Order and refer to a UMD construction crew or transmit it to OEC for repair and/or replacement of the laterals by the on-call contractor. An

acute or catastrophic failure is defined as “a material, structural failure of a Collection System lateral that cannot be remedied through ordinary maintenance procedures (e.g., clearing the ladder with a rod like apparatus called a “sewer rodder”, etc.), typically requiring excavation and/or construction to remediate.”

UMD implements the following procedures to address blockages in Collection System laterals:

1. Upon arrival, the crew will search for the customer’s external cleanout. If the external cleanout cannot be found, the customer must direct the crew to its location. If the customer is not home or is unavailable, the crew will leave a notice for the customer to locate the external cleanout and call Control One; or, alternatively, to contact a licensed plumber to locate/install an external cleanout and clean the lateral from the house to the mainline.
2. Once the external cleanout has been accessed, the crew will work from the cleanout using an electric machine or sewer rodder to clear any significant blockage(s) between the cleanout and the mainline. If a cutter is needed, the crew will use the small cutter head attachment until it can pass freely from the cleanout to the mainline, increasing the size of the cutter attachments until the maximum size cutter attachment for that pipe is able to pass freely to the mainline.
3. If possible, the crew will capture the debris from the blockage and document its contents.
4. After the crew has removed the blockage, the crew will insert a Mini-Camera Unit (MCU) into the external cleanout and inspect the lateral to the mainline. If the Collection System lateral is clear, the Work Order and the SR will be closed and the customer will be notified.
5. If the MCU goes underwater during the CCTV inspection or an acute or catastrophic failure is observed, the crew will continue the CCTV as far as possible and document any relevant observations. If the failure is due to an issue in the private lateral, the crew will notify the customer to address the situation in the private lateral by hiring a licensed plumber.
6. If the inspection reveals an acute or catastrophic failure in the Collection System lateral, the crew will either address the issue or notify Control One to create a child Work Order. This may include a Work Order to implement bypass pumping. The referral will be documented and the new Work Order(s) will be assigned by a UMD supervisor to the appropriate UMD crew or transmitted to OEC for assignment to an on-call contractor for resolution as soon as possible.
7. Once the Collection System lateral has been repaired, the crew will inspect the upstream and downstream portions of the lateral to ensure there are no identifiable blockages or malfunctions before connecting the replaced lateral segment to complete the repair.
8. If the customer is available, the crew will notify the customer that work is complete and ask the customer to test the drainage by running the water.

9. Once all assigned work regarding the Collection System lateral is performed, the Work Order(s) and associated SR(s) will be closed.

## 2.4 Public Education on Building Backups

DPW's Office of Communications and Strategic Alliances (OCSA) performs continuous public education and outreach to help citizens understand how ratepayer funds are invested to maintain and improve the Collection System and wastewater treatment plants. As part of these efforts, the OCSA will disseminate information regarding Building Backups through the DPW website, brochures, and similar methods, including the following:

- News releases
- Press conferences
- Public events
- Flyers, presentations, and related promotional materials distributed at meetings and events
- DPW website and social media accounts (e.g., Facebook, Twitter, Nextdoor, YouTube)
- Media interviews and appearances
- Water bill inserts and messages

The OCSA seeks to augment its educational material by performing outreach through multiple media in order to explain, repeat, and amplify the messaging. In order to supplement current educational resources, DPW has now divided its informational Sewage Backup Guide into three easy-to-read brochures and infographics detailing three distinct topics related to sewage backups:

1. Understanding and Preventing Sewage Backups
2. Handling Sewage Backups
3. The Sewage Backup Expedited Reimbursement Program

These brochures can educate the public about sewage backups and the steps that individuals can take to report, clean up, document, and protect themselves, as well as potential health and safety issues related to contact with sewage. The brochures also cover the General Liability Claims Process administered by the Baltimore City Law Department. This information is available on the DPW website. These materials may also be distributed during community events and other outreach opportunities. Where practical, DPW's messaging regarding Building Backups will be paired with information regarding SSOs to reflect that these events often share similar causes (e.g., inappropriate disposal of fats, oils, and grease [FOG]) and other non-flushable materials, or root intrusion). DPW has initiated a branded information campaign called "Clear the FOG", which is designed to dispel myths around disposal of FOG and encourage the proper disposal of FOG. Additional information explaining the hidden costs of FOG and special

holiday messaging focused on proper FOG disposal while cooking is also being made available. These campaigns are shared via the DPW website and social media channels including Instagram, Facebook, and Twitter, and directly to communities via the Nextdoor community application. The following section provides details on the Pilot Building Backup Expedited Reimbursement Program.

## 2.5 Pilot Building Backup Expedited Reimbursement Program

DPW established a Pilot Building Backup Expedited Reimbursement Program (“The Pilot Program”) pursuant to Appendix E of the MCD. The Pilot Program reimburses City homeowners, renters, and other non-commercial occupants (homeowners) up to \$5,000.00 per dwelling unit, per qualifying event for reasonable, documented expenses arising from Building Backups, if a backup is the result of surcharging in the Collection System caused by wet-weather events (Capacity-Related Building Backups [CRBB]). “Dwelling unit” is defined as provided in Section 1-137 of the Zoning Code of Baltimore City.

The Pilot Program began on April 6, 2018, and ran until April 6, 2021. A Long-Term Building Backup Expedited Reimbursement Program has been transmitted to EPA and MDE for consideration. The Long-Term plan proposes to supersede the expedited reimbursement program with the Sewage Onsite Support (SOS) program, a direct response service that provides proactive cleaning and sanitizing services for a sewer building backup event. During the transition, both the pilot program and the new SOS program are active.

Historical events that occurred prior to April 6, 2018, are ineligible for reimbursement. The Pilot Program’s annual funding for reimbursement of costs was \$2,000,000.00. The DPW BWW administers the Pilot Program on the City’s behalf and makes all written determinations within 60 days of receiving all required information and documentation in support of an application for reimbursement under the Pilot Program. Reimbursements are limited to documented, reasonable expenses for cleanup, and disinfection of interior spaces that result from a verified CRBB. Applications are available online at the DPW website, in the DPW Customer Support and Services Division Walk-In Center in the lobby of the Abel Wolman Municipal Building, and upon request. Applications must be sent to the Bureau at the following address:

Baltimore City Department of Public Works  
Office of Legal and Regulatory Affairs  
Abel Wolman Municipal Building  
200 Holliday Street  
Baltimore, MD 21202

Applications are accepted by email ([reimbursement@baltimorecity.gov](mailto:reimbursement@baltimorecity.gov)), U.S. mail, or an equivalent method of commercial delivery. Applications will be processed in the order they are received, and all applications will be finalized for acceptance or denial, provided that all supporting documentation and information is received from the applicant. If multiple applications are received for the same dwelling unit for expenses arising from the same event, the initial reimbursement (if any) will be subtracted from the aggregate \$5,000.00 limit for all subsequent applications pertaining to the same event for the same dwelling unit. If an application is missing necessary information, BWW will notify the applicant in writing if contact information is

available. The application may be denied if the applicant fails to provide the necessary information within 365 days after notice from BWW. Homeowners with insurance determinations pending may supplement their application as provided below.

The Pilot Program is being advertised through various media, including the DPW website, community outreach events, and billing inserts. Sewage backup informational brochures are distributed to customers when the City responds to sewage backups as described in Section 2.1. In addition to the requirements stated above and provided in Appendix E of the MCD, the homeowner must file an application with BWW, at the address provided above, within 90 days of discovering the CRBB. The City recommends that homeowners promptly notify the City through the 311 System as soon as possible following discovery of the backup.

If a homeowner has an insurance policy that covers Building Backups, the insurance coverage must be used to its limit before the incident may be eligible for reimbursement through the pilot program. Cleanup and disinfection expenses covered by insurance are not eligible for reimbursement. Insurance deductibles may be eligible for reimbursement, provided that BWW receives documentation to demonstrate that the costs incurred were reasonable and related to disinfection and cleanup arising from a CRBB. Although applications must be received by BWW within 90 days after the incident, the homeowner may supplement the application with insurance-related documentation once a final determination is received from the insurance company. Applications with an insurance claim pending will be held in abeyance until the homeowner's insurance company issues a final determination, provided that the insurance documentation be received by BWW within 30 days after the homeowner receives the final determination from the insurance company.<sup>2</sup>

If BWW determines that an application is eligible for reimbursement, the Bureau will provide the homeowner with a final, written determination and include a release for signature and notarization. The release will be for the costs of cleanup and disinfection arising from the CRBB. BWW will not authorize reimbursement for any application until a signed release is received. Upon receipt of a signed release with the appropriate notarization, BWW will initiate the payment process. All payments will be issued by the Baltimore City Department of Finance in accordance with the City's established procedures. BWW will track applications received under the Pilot Program, including:

1. The date of the incident
2. The amount requested
3. The determination and associated rationale
4. The date of each determination.

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<sup>2</sup> Failure to provide any documentation in a timely manner may not extend any applicable notification required by law or any applicable statute of limitations.

This data is reported on in the DPW Quarterly Reports (QRs). BWW will collaborate with the DPW Office of Fiscal Management and the Baltimore City Department of Finance to maintain proper accounting and documentation regarding funds disbursed under the Pilot Program.

### 3.0 SANITARY DISCHARGE OF UNKNOWN ORIGIN (SDUO) NOTIFICATION

The DPW Office of Compliance and Research (OCR) is responsible for investigating and tracking the elimination of illicit discharges to the storm sewer system. If an illicit discharge appears to be related to sewage, based on visual and chemical indicators, but the source(s) cannot be identified, then the discharge is designated as an SDUO for further investigation. The City's investigation and tracking procedures are included in the SDUO Plan, which was submitted to EPA and MDE on February 2, 2018. Within 24 hours of designation of an SDUO, the OCR field personnel shall notify the OCSA Chief.

The notification shall provide the location of the discharge (outfall location), estimated discharge rate, stream name, and eight-digit watershed. Upon receipt, the DPW OCSA Chief (or designee) will post a notice containing this information on the DPW website. The posted notice will also remind the public of the impact on water quality.

Within 48 hours of the SDUO designation, OCR field staff shall post temporary SSO notification signs at the outfall location until the SDUO is abated. OCR will post new temporary signage within a reasonable time after discovery if the signs are damaged or removed by a third party. For outfalls with chronic SDUOs, OCR field staff shall post permanent signage at the outfall until the SDUO is abated. Signs will be placed to maximize public outreach. DPW will notify the Baltimore City Health Department (BCHD) of sign placement. An outfall may be considered as having chronic SDUOs if the following conditions are encountered:

- SDUO lasts more than 90 days, or:
- Multiple SDUOs have been found in the outfall's drainage areas for the last two years.

A list of outfalls with chronic SDUOs shall be maintained and updated in the MCD QR.

## 4.0 COLLECTION SYSTEM SANITARY SEWER OVERFLOWS (SSOS)

### 4.1 Public Notification

In the event of a confirmed SSO, DPW initiates a coordinated effort to respond promptly and appropriately. Internal notification protocols are provided in Attachment B. As provided in Section 4.1 of Attachment B, the City will provide public notice of all confirmed SSOs that reached or are likely to reach surface waters or storm drains. Once an SSO is confirmed, the City will issue public notices on the DPW website, within 24 hours of the SSO occurrence, utilizing an interactive map to identify the location of each SSO. DPW will also notify BCHD so that they may provide notice of confirmed SSOs via social media or other websites where BCHD regularly posts information. Public notices will provide pertinent information regarding each SSO when it becomes available, including the date and time at which the SSO began, the estimated volume of the discharge, and the name of the receiving water(s), if applicable. Notices will include an advisory regarding the adverse impact on water quality. Notifications may also be shared on the DPW website, Twitter feed, and disseminated via other social media tools. The City's procedures for notifying EPA, MDE, BCHD, and others are detailed in Sections 4.1 and 4.2. The presence (or absence) of adverse impact from an SSO does not determine whether surface water is safe for recreational use. MDE has listed all surface waters in the City as impaired for bacteria. As such, receiving water quality may not meet applicable parameters for full-body contact recreation, independent of the impact of a specific SSO event. The City discourages full-body contact with surface water, and there are no designated locations in Baltimore City for full-body contact recreation in surface water. If City recreation programs may involve infrequent water contact, such as kayaking, participants are provided appropriate educational materials. Similar messages are also disseminated on City websites.

### 4.2 List of Overflow Locations

The City has identified seven locations where SSOs are likely to occur during wet-weather events (Table B-1) and has designated these Emergency Notification System (ENS) sites. At the onset of an SSO event at ENS locations, the flow meter will send an email when the flow level reaches the manhole cover ("event has occurred") and when the flow level recedes below the manhole cover ("return to normal"). Eleven structured SSO locations still occasionally activate during wet-weather events (Table B-2). The City monitors flow at SSO structures. If an SSO occurs, DPW will post temporary SSO notification signs, in Spanish and English, to notify the public, and will also notify the BCHD of sign placement. The severity of overflows at these locations depends on factors such as rain event intensity, distribution, footprint, and time of day.

**Table B-1: List of Seven Overflow Locations (Likely Activation)**

|   | Overflow Location  | Asset Identification (ID) | Zip Code | Sewershed   |
|---|--------------------|---------------------------|----------|-------------|
| 1 | 1218 Armistead Way | S611I_025MH               | 21205    | Herring Run |

|   | Overflow Location               | Asset Identification (ID) | Zip Code | Sewershed    |
|---|---------------------------------|---------------------------|----------|--------------|
| 2 | 1124 Armistead Way              | S63GG_013MH               | 21205    | Herring Run  |
| 3 | 2121 Wicomico Rd.               | S23W_001MH                | 21230    | Low Level    |
| 4 | 1731 Chase St.                  | S43EE_034MH               | 21213    | High Level   |
| 5 | 1819 E. Eager St.               | S45CC_007MH               | 21213    | Outfall      |
| 6 | Belair Rd. at Herring Run Trail | S55YY_002MH               | 21206    | Herring Run  |
| 7 | Gwynns Falls at Leon Day Park   | S11A_001MH                | 21216    | Gwynns Falls |

**Table B-2: List of 11 Structured Overflow Locations (Occasional Activation)**

| No  | Overflow Location   | Asset ID    | Zip Code | Sewershed    |
|-----|---|-------------|----------|--------------|
| 67  | Falls Rd., approximately 1,100 feet (ft.) northwest of US-1 bridge intersection | S31MM_013MH | 21211    | Jones Falls  |
| 72  | Rear of 428 East Preston St.  | S37GG_007MH | 21202    | Jones Falls  |
| 135 | 3104 Liberty Heights Ave.   | S11UU_008MH | 21215    | High Level   |
| 138 | W. Cold Spring Ln. & Ayrdale Ave.   | S07EE1023MH | 21215    | High Level   |
| 139 | W. Garrison Ave. & Queensberry Ave.   | S11QQ1002MH | 21215    | High Level   |
| 152 | N. Charles St. & W. Lanvale St.   | S33II_004MH | 21202    | Jones Falls  |
| 154 | N. Charles St. & W. Lafayette Ave.  | S33KK_033MH | 21201    | Jones Falls  |
| 155 | 3404 Glen Ave.  | S03WW1008MH | 21215    | Jones Falls  |
| 156 | Charing Cross Rd. & Greenwich Ave.  | S08G__001MH | 21229    | Gwynns Falls |
| 157 | E. 32nd St. & St. Paul/Hargrove Alley   | S35YY_036MH | 21218    | Jones Falls  |
| 158 | 428 E. Preston St.  | S37GG_040MH | 21202    | Jones Falls  |

### 4.3 Available Resources and Preparedness Training

The City maintains various personnel and resources to respond to SSOs. DPW UMD is the first responder to investigate and address overflows that are reported to the City. UMD maintains various resources to address SSOs, including vacuum trucks, CCTV equipment, jetter trucks, backhoes, dump trucks, bypass pumps, power generators, and numerous vehicles. DPW OEC also has available on-call contractors to supplement UMD's resources as needed. DPW OAM provides technical support to UMD and OEC.

In 2015, DPW implemented a field SSO reporting software application. This application is designed to record the details of an SSO event, capture images, and generate the 5-Day Reports prescribed by Paragraph 17. DPW also monitors response and reporting procedures for SSO events through an internal SSO Compliance Team. The Team coordinates the submittal of 5-Day Reports and provides support and training to First Responders and other staff involved in

SSO response. The Team also performs root-cause analysis of SSO events and determines and coordinates necessary repairs to prevent re-occurrence.

In addition to these duties, the Team coordinates SSO response training every year, which is attended by staff from various offices and divisions within DPW, including DPW OCR, OCSA, UMD, and OAM.

#### **4.4 Minimizing SSO Volume, Implementing Institutional Controls, and Notifying EPA, MDE, and BCHD**

The City's objective is to minimize overflow volume by abating SSOs as soon as possible. If the situation requires additional resources and time to stop the discharge, crews may install bypass pumping to abate the SSO. The City's Standard Operating Procedure (SOP) for SSO events is summarized below, and the City's procedures for SSOs caused by Pumping Stations are prescribed in Section 5. In addition to the reactive procedures detailed in this ERP, the City has implemented numerous proactive maintenance programs and projects to minimize the number and volume of SSO events. These programs include FOG control, root control, cleaning and lining, root cause analysis of SSOs with needed repairs, and capital projects, including those identified in Appendix B of the MCD. These initiatives have yielded favorable results as evidenced by a continued reduction of SSO events over time.

##### **4.4.1 SSO SOP**

The SOP provides general procedures for investigating and abating SSOs to minimize overflow volume and implement institutional controls to advise the public and limit access to SSO sites. In addition, this SOP provides standard procedures to report SSOs to EPA, MDE, and BCHD. See Attachment B for latest SOP text.

## 5.0 PUMPING STATION OVERFLOWS

### 5.1 Introduction

Within DPW, BWW is responsible for the Operation and Maintenance (O&M) of all wastewater collection and treatment assets. Within BWW, the Wastewater Facilities Division oversees the O&M of pumping stations as listed in Table C.

**Table C: Wastewater Pumping Stations**

| Station        | Location              | Maximum Design Pumping Capacity (MGD) <sup>a</sup> | Relevant Section |
|----------------|-----------------------|--|------------------|
| Eastern Avenue | 751 E. Ave.           | 100  | Section 5.4.1    |
| Brooklyn       | 3404 S. Hanover St.   | 18.5   | Section 5.4.2    |
| Dundalk        | 2203 Broening Highway | 33.3   | Section 5.4.3    |
| Jones Falls    | 3600 Ash St.          | 55   | Section 5.4.4    |
| Locust Point   | 2290 E. Fort Ave.     | 3.6  | Section 5.4.5    |
| Quad Avenue    | 701 N. Point Rd.      | 30   | Section 5.4.6    |
| McComas        | 1800 Key Highway      | 1.1  | Section 5.4.7    |
| Westport       | 2911 Waterview Ave.   | 3.5  | Section 5.4.8    |
| Stony Run      | 2840 Sisson St.       | 17   | Section 5.4.9    |

<sup>a</sup> MGD – Million Gallons per Day

In the event of emergencies concerning any of the above-listed pumping stations, an internal communication protocol has been developed. Regardless of the pumping station experiencing the emergency, this communication protocol can be used by all City personnel responding to emergencies. Table D lists the key individuals in the communications protocol.

**Table D: Emergency Contact List (in order of notification)**

| Emergency Contact List |                              |
|------------------------|------------------------------|
| Name:                  | Chris Stielper               |
| Organization:          | Baltimore DPW                |
| Title:                 | Manager of Pump Station O&M  |
| Name:                  | Michael Hallmen              |
| Organization:          | Baltimore DPW                |
| Title:                 | Chief, Wastewater Facilities |
| Name:                  | Yosef Kebede                 |
| Organization:          | Baltimore DPW                |
| Title:                 | Bureau Head, BWW             |

| Emergency Contact List |                   |
|------------------------|-------------------|
| Name:                  | Jason W. Mitchell |
| Organization:          | Baltimore DPW     |
| Title:                 | DPW Director      |

Figure 5-1 depicts a decision flow chart for notification and response in the event of pump station emergencies.

Section 5.2 (Tables E through M) contains station-specific emergency response procedures, and Section 5.3 contains general emergency procedures for force mains.

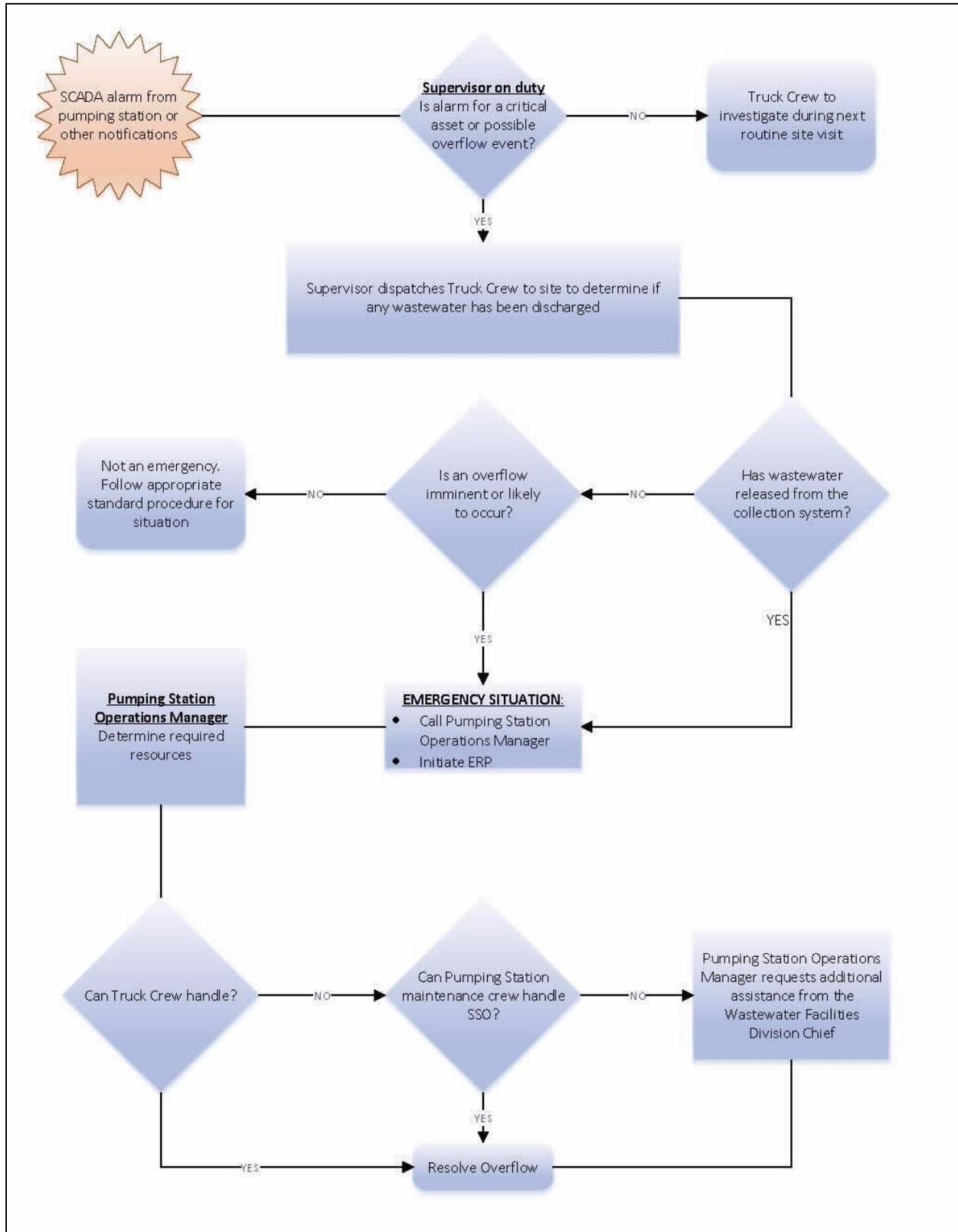


Figure 5-1: Pump Station Emergency Decision Chart

## 5.2 Station-Specific Emergency Response Procedures

### 5.2.1 Eastern Avenue Pumping Station

**Directions for Police/Fire/EMS Dispatch:** 751 Eastern Avenue, Baltimore. Fire/EMS access to Generator Building by gate on Fleet Street opposite the Marriott Hotel. Generator building is on your right.

**Table E: Eastern Avenue Pumping Station Data**

| Eastern Avenue Station     |   |
|----------------------------|---|
| Station Address:           | 751 Eastern Avenue, Baltimore, MD 21225   |
| Station Telephone No.      | (410) 396-4972  |
| First Likely SSO Point     | Manhole on intersection of President St./Eastern Ave. and manholes in the vicinity of the intersection of Aliceanna St. and S. Central Ave. |
| (Channel) Storage Capacity | Approximately 500,000 gallons; limited in-line storage  |
| Est. Generator Run Time:   | Approximately 24 hours, depending on flow   |
| Influent Flow Rate         | Estimated Storage Time  |
| Minimum: 18 MGD            | Approximately 40 minutes  |
| Average: 22 MGD            | Approximately 30 minutes  |
| Maximum: 100 MGD           | Approximately five minutes  |

- **Station:** The station is continuously staffed and is the control point for the Supervisory Control and Data Acquisition (SCADA) system.
- **Redundant power:** Station is equipped with dual utility feeders with automatic transfer switchgear, two 2,000 kilovolt-ampere emergency generators. Duplex emergency generators support full station hydraulic capacity.
- **Portable gas detection:** Portable gas detection equipment is stored in the Electrical Room.
- **Pumps:** Five electric drive sewage pumps available, with sixth diesel drive emergency overboard pump.
- **Force main:** Three force mains in service.
- **Emergency bypass availability:** The nearest structure to bypass into would be the Main Outfall Interceptor several miles west of the station along Eastern Avenue. This will require the use of an on-call pumping contractor.
- **Likely collection system overflow point:** The first indication of an SSO will be within the station as the wet well overflows and floods the boiler room. The structure that is likely to experience an SSO first (outside the pump station) is the sanitary sewer

manhole at the intersection of Eastern Avenue and President Street. Also at risk are low-lying manholes and manholes in the vicinity of the intersection of Aliceanna St. and S. Central Ave.

### Electrical Fault

1. Does the station have power?
  - Verify the station has power on all three phases by checking the metering on the 480-volt switchgear at the pump station. Voltage should read 480 volts +/- on all three phases.
  - If power is not present on all three phases, immediately request an electrician to respond. The station switchgear should only be operated by a qualified electrician.
  - Loss of one of the two utility feeds should automatically transfer load to the energized feeder. If both utility feeders fail, the station generators should start and transfer load. If manual starting of the generators is required, this can only be done by *authorized personnel* at controls in the Generator Building.
2. Do the pumps and auxiliary equipment have power?
  - Check that all circuit breakers are closed at the Motor Control Center (MCC).
  - Check that the motor starters have power on all three phases. In the event of failure of the soft-start control failure, the equipment should automatically revert to auxiliary direct-on-line starters.
  - Check for power to the seal water pumps and vacuum prime pump system. Check for vacuum on the common vacuum header gauge. Remember that the pumps cannot start on bubbler wet well level control unless and until the vacuum prime and seal water pumps are operating.

### Mechanical Fault

1. Is the pump operating deck flooded?
  - Visually check the pump deck. At the Eastern Avenue Station, any leak in the vicinity of the sewage pumps will be readily apparent. Any leak or breakage in the force main header may occur within the force main header structure in front of the station along Eastern Avenue. The first indication of a break within this structure may be surcharging and an SSO in the area.
  - Immediately stop the affected sewage pump. In most cases it should be possible to isolate the leak or break by closing the appropriate valves as described in the station O&M Manual.
2. Is there a high Screening Channel Alarm, with or without a collection system SSO?
  - First, verify this condition by manually inspecting the Screening Channel.

- A high level in the Screening Channel indicates that the sewage pumps are not operating, or are not conveying sufficient flow to the force main. If none of the pumps are operating and three-phase power is available, verify that the seal water and vacuum prime pumps are operating. Attempt manual start of any one electric pump. When starting a pump by “hand” switch at the MCC, remember these pumps start against a closed cone valve. Visually verify the pump cone valve is opening (about 120 seconds travel time) after starting the pump.
  - If the pump motors are running and no/low flow is indicated on the station flowmeter, investigate valve positions, including cone and isolation valves, and verify that the pump couplings are intact. Attempt to return at least one pump to service.
3. Is there a low wet well alarm, with or without a collection system SSO?
- Investigate the bar screens. Both bar screens are normally operated in parallel, and failure/ obstruction of both units would be unlikely. Check the bar screen circuit breakers located in the switchgear room. During normal daytime dry-weather flows, any one screen can accommodate station flow, so isolating one of the two screens is an option. It is not possible to bypass the screening channel entirely at the Eastern Avenue station.

#### **Instrumentation and Control Fault**

Alarm conditions as displayed at the operator’s control station are self-explanatory. See the Eastern Avenue Station O&M Manual for troubleshooting and repair of specific systems.

Eastern Avenue Station local control is provided by the station Programmable Logic Control (PLC). This system has multiple redundant features. In the unlikely event of complete PLC failure, the station will default to operating on the bubbler tube screening channel level control system.

### 5.2.2 Brooklyn Pumping Station

**Directions for Police/Fire/EMS Dispatch:** 3404 South Hanover Street, Baltimore. Brick structure; nearest intersection is South Hanover St. and Frankenfurst Avenue. Enter station from South Hanover driveway.

**Table F: Brooklyn Pumping Station Data**

| Brooklyn Station                |  |
|---------------------------------|--|
| Station Address:                | 3404 S. Hanover Street, Baltimore, MD 21225                          |
| Station Telephone No.           | (410) 396-9497   |
| First Likely SSO Point          | First manhole upstream from the Pumping Station on S. Hanover Street |
| Storage Capacity                | Approximately 80,000 gallons (wet well); limited in-line storage     |
| Est. Generator Run Time:        | Approximately 2 ½ days   |
| Influent Flow Rate              | Estimated Storage Time   |
| Minimum: 1.73 MGD               | Approximately one hour, seven minutes                                |
| Average: 1.93 MGD               | Approximately one hour   |
| Maximum: 15.00 MGD <sup>a</sup> | Approximately eight minutes  |

<sup>a</sup> Highest flow recorded

- **Station:** The station is monitored by SCADA system.
- **Power:** Station is equipped with emergency generator and Automatic Transfer Switch (ATS) for station service.
- **Pumps:** Two pumps with third standby/wet weather pump available.
- **Force main:** Alternate force main available.
- **Emergency bypass availability:** Flow can be diverted by pumping to the nearest gravity sewer manhole located on South Hanover Street, 530 ft. south of the station on the west side of the street.
- **Likely collection system overflow point:** First manhole upstream from the pumping station on South Hanover Street.

#### Electrical Fault

1. Does the station have power?
  - Verify the station has utility power present on all three phases of the three-phase service. This can be done by checking the display on the utility meter located in the station control room. If power is not present on all three phases, immediately request an electrician to respond.

- Loss of one of three phases may, or may not, cause the generator to start and the ATS to transfer load from utility power to generator power. In an emergency situation involving loss of one or more phases of the utility power, *and* the generator not starting automatically, manually start the generator and transfer load using the controls on the ATS.
2. Do the pumps and auxiliary equipment have power?
    - Check that all circuit breakers are closed at the MCC. Remember that the pumps will not start on radar/bubbler wet well level control unless and until the vacuum prime and seal water pumps are operating.

### **Mechanical Fault**

1. Is the dry well flooded?
  - Visually check the pump deck. Any appreciable amount of water indicates a pipe break or equipment leak. If necessary, stop all sewage pumps and allow the sump pump to dewater the dry well. In most cases it should be possible to isolate the leak or break by closing the appropriate valves and re-starting the station.
2. Is there a high wet well alarm, with or without a collection system SSO?
  - This indicates that the sewage pumps are not operating or are not conveying sufficient flow to the force main. If none of the pumps are operating and three-phase power is available, verify that the seal water and vacuum prime pumps are operating.
  - Attempt manual start of the standby/wet weather Pump #3. Check the wet well level control systems: if these are inoperative, sewage pumps may be started manually at the MCC.
  - If the pump motors are running, investigate valve positions, including check valves, and verify that the pump couplings are intact. Investigate suction line obstructions (uncommon, but possible). Attempt to return at least one pump to service.
3. Is there a low wet well alarm, with or without a collection system SSO?
  - Investigate the bar screen. If it is blocked and cannot promptly be returned to service, isolate and bypass screening equipment using the procedure in the Brooklyn Station O&M Manual.
  - If the bar screen is operating and there is low flow in the influent channel, investigate for an upstream gravity sewer break or obstruction.

### **Instrumentation and Control Fault**

Alarm conditions reported via SCADA or station alarm are self-explanatory. See the Brooklyn Station O&M Manual for troubleshooting and repair of specific systems.

The Brooklyn Station operates under local control. Control loop failure will not interrupt the normal operation of the station.

Brooklyn Station local control is provided by the station PLC. This system has multiple redundant features. In the unlikely event of complete PLC failure, the station will operate on a single pump. Pump #3 will operate independently on wet well float control.

If the PLC fails, the station should be staffed continuously until the PLC is returned to service.

### 5.2.3 Dundalk Pumping Station

**Directions for Police/Fire/EMS Dispatch:** 2203 Broening Highway, Baltimore. Driveway is 200' north of the intersection of Broening Highway and Keith Avenue.

**Table G: Dundalk Pumping Station Data**

| Dundalk Station          |   |
|--------------------------|---|
| Station Address:         | 2203 Broening Highway, Baltimore MD 21224                         |
| Station Telephone No.    | (410) 396-7287  |
| First Likely SSO Point   | Manholes, immediate vicinity of the station                       |
| Storage Capacity         | Approximately 150,000 gallons (wet well); limited in-line storage |
| Est. Generator Run Time: | 14 to 15 hours  |
| Influent Flow Rate       | Estimated Storage Time  |
| Minimum: 8.10 MGD        | Between one to 1 ½ hours  |
| Average: 9.82 MGD        | Approximately one hour  |
| Maximum: 33.00 MGD       | Approximately 18 minutes  |

- **Station:** The station is monitored by SCADA system.
- **Power:** Station is equipped with dual utility feeders and emergency generator.
- **Three-gas detection system:** Alarm visible from outside of building near door.
- **Pumps:** Four identical sewage pumps available.
- **Force Main:** Reserve 36-inch (in.) force main available.
- **Emergency bypass availability:** Portable pumps can be used to pump from the wet well to the pump-around connection on the 36-in. force main and will require a manifold and valve installed. An access hatch is located on the south side of the station. One bypass option for this station if the sewage pumps are operable is to return the reserve (old) force main to service by closing the gate valve to the service force main and opening the 24-in. to the reserve (old) force main.
- **Likely collection system overflow point:** Manhole in the Trucking School parking lot, west of Dundalk Station.

## Electrical Fault

1. Does the station have power?
  - Verify the station has power on all three phases by checking the metering on the switchgear. Voltage should read 480 volts +/- on all three phases. If power is not present on all three phases, immediately request an electrician to respond.
  - The station switchgear should only be operated by a qualified electrician. Loss of any or all phases should automatically start the station generator and transfer load. If manual starting of the generator is required, this can only be done by controls on the ATS in the switchgear room.
2. Do the pumps and auxiliary equipment have power?
  - Check that all circuit breakers are closed at the MCC. Single-phase loads have circuit breakers located in Panel L. Remember that the pumps cannot start on radar/bubbler wet well level control unless and until the vacuum prime and seal water pumps are operating. Bypass switches are provided on all Variable Frequency Drives (VFDs).

## Mechanical Fault

1. Is the dry well flooded?
  - Visually check the pump deck. Any appreciable amount of water indicates a pipe break or equipment leak. If necessary, stop all sewage pumps and allow the sump pump to dewater the drywell. In most cases it should be possible to isolate the leak or break by closing the appropriate valves and re-starting the station.
  - The pump drive motors are not submersible. If the drive motors have been submerged, do not attempt to start them until they have been inspected by a qualified electrician. Begin planning for emergency bypass pumping.
  - Any substantial leak caused by pipe breakage may require dewatering the drywell by vacuum truck.
2. Is there a high wet well alarm, with or without a collection system SSO?

**Note:** Dundalk Station is equipped with an auxiliary float system in the wet well to automatically run pumps at high wet well alarm levels.

  - This indicates that the sewage pumps are not operating, are not conveying sufficient flow to the force main, or discharge valve is stuck/closed. If none of the pumps are operating and three-phase power is available, verify that the seal water and vacuum prime pumps are operating by checking the pressure and vacuum gauges, respectively.
  - Attempt manual start of any one pump. When starting a pump by “hand” switch at the MCC, remember these pumps start against a closed cone valve. Visually verify the pump cone valve is opening (about 90 seconds travel time) after

starting the pump. If the pump motors are running and no/low flow is indicated on the station flowmeter, investigate valve positions, including the plug and cone valves, and verify that the pump couplings are intact.

- Attempt to return at least one pump to service.

3. Is there a low wet well alarm, with or without a collection system SSO?

- Investigate the bar screens. Both bar screens are normally operated in parallel, and failure/ obstruction of both units would be unlikely. Check the bar screen circuit breakers located in Panel WW in the switchgear room.
- Any one screen can accommodate station flow, so isolating one of the two screens is an option. As a last resort, the screen channel may be bypassed entirely with flow entering the wet well from the influent bypass structure. This procedure should be undertaken only in an emergency. Unscreened solids entering the wet well will eventually rag and disable the pumps. The screening channel bypass procedure is described in the Dundalk Station O&M Manual.

### **Instrumentation and Control Fault**

Alarm conditions reported via SCADA or station alarm are self-explanatory. See the Dundalk Station O&M Manual for troubleshooting and repair of specific systems.

The Dundalk Station operates under local control. Control loop failure will not interrupt the normal operation of the station.

Dundalk Station local control is provided by the station PLC. This system has multiple redundant features. In the unlikely event of complete PLC failure, the station will default to operating on the float wet well level control system. If the PLC fails, the station should be staffed continuously until the PLC is returned to service.

### 5.2.4 Jones Falls Pumping Station

**Directions for Police/Fire/EMS Dispatch:** 3400 Ash Street, Baltimore. West of the intersection of Clipper Mill Road and Ash Street.

**Table H: Jones Falls Pumping Station Data**

| Jones Falls Station          |   |
|------------------------------|---|
| Station Address:             | 3600 Ash Street, Baltimore MD 21211                               |
| Station Telephone No.        | (410) 396-6579  |
| First Likely SSO Point       | None (station has 27" overflow relief gravity sewer) <sup>a</sup> |
| Storage Capacity             | 51,700 Gallons (wet well); 125,000 gallons (in-line storage)      |
| Est. Generator Run Time:     | Indefinite (natural gas fuel)                                     |
| Influent Flow Rate           | Estimated Storage Time  |
| Minimum: 13.0 MGD            | 20 minutes  |
| Average: 17 MGD              | 15 minutes  |
| Maximum: 42 MGD <sup>b</sup> | Six minutes   |

<sup>a</sup> Low point of the 27-in. relief sewer located at 1911 Falls Road., immediately west of RR overpass

<sup>b</sup> Highest flow recorded

- **Station:** The station is monitored by SCADA system.
- **Power:** Station is equipped with dual primary utility feeders, and emergency natural gas fired generator and ATS for station service.
- **Pump:** Three pumps are available – two in alternating service and the third standby/wet weather.
- **Force main:** Two usable force mains – 30-in. (standby) and 36-in. (service).
- **Emergency bypass availability:** In the event the wet well overflows, the surcharge will have to be pumped to the nearest gravity sewer manhole. There is a 27-in. bypass relief sewer that can take some of the overflow. The station is provided with an emergency (additional) wet well.
- **Operational note:** In dry weather conditions, flow will normally bypass the station to the 27-in. relief sewer. This sewer may become surcharged during some wet-weather events, resulting in loss of hydraulic capacity and a possible high wet well level condition.
- **Likely collection system overflow point:** Because there is a bypass sewer that relieves the station overflow chamber, the first likely SSO point is the SSO #67 structure at 1911 Falls Road. Any flow from this point will enter Jones Falls.

## Electrical Fault

1. Does the station have power?
  - Verify the station has utility power present on all three phases of the three-phase services. This can be done by checking the display on the utility meter located on the switchgear. If power is not present on all three phases, immediately request an electrician to respond. It is unlikely that both 13.8-kilovolt feeders would be de-energized at the same time. Do not attempt to operate the primary power switchgear.
  - Loss of one of utility power on both primary feeders will cause the generator to start and the ATS to transfer load from utility power to generator power. In an emergency situation involving loss of both 13.8-kilovolt feeders and the generator not starting automatically, manually start the generator and transfer load using the controls on the ATS. Follow the procedure described in the Jones Falls Station O&M Manual.
2. Do the pumps and auxiliary equipment have power?
  - Check that all circuit breakers are closed at the MCC. In the unlikely event both bubbler tube systems and float switch wet well level controls are disabled, pumps can be started manually at the VFDs if three-phase power is available at the MCC. The pump seal water systems are interlocked through the VFD and should start before the pump starts on time delay. After starting pump, verify that the pump discharge valve *to the desired force main* (36-in. or 30-in.) has opened.
  - Check for power for single-phase 120-voltloads at Panels LP-1 through LP-4. Upon loss of power to the PLC, the station will automatically switch to bubbler tube level control.

## Mechanical Fault

1. Is the dry well flooded?
  - Visually check the pump deck. Any appreciable amount of water indicates a pipe break or equipment leak. If necessary, stop all sewage pumps and allow the sump pumps to dewater the drywell. In most cases it should be possible to isolate the leak or break by closing the appropriate valves and re-starting the station.
  - Note that the pump motors and related equipment are not submersible equipment. Do not attempt to re-energize this equipment if it has been submerged. The motors and related electrical connections must be inspected by a qualified electrician prior to returning them to service.
2. Is there a high wet well alarm, with or without a collection system SSO?
  - This indicates that the sewage pumps are not operating, are not conveying sufficient flow to the force main, or discharge valve is stuck/closed. If none of the pumps are operating and three-phase power is available, check the wet well level

control systems. In the unlikely event that both bubbler tubes systems and the float controls are inoperative, sewage pumps may be started manually at the VFDs. If the pump motors are running, investigate the pump couplings and valve positions, including the pump suction plug and outlet cone valves. Attempt to return at least one pump to service.

3. Is there a low wet well alarm, with or without a collection system SSO?
  - Investigate the bar screens and screening channels. If one or the other screen is fouled or otherwise inoperative and cannot promptly be returned to service, isolate and bypass the screening channel using the procedure in the Jones Falls Station O&M Manual.
  - If the screens are operating and there is low flow in the screening channels, investigate the 48-in. upstream gravity sewer for a break or obstruction.

#### **Instrumentation and Control Fault**

Alarm conditions reported via SCADA or station alarm are self-explanatory. See the Jones Falls Station O&M Manual for troubleshooting and repair of specific systems.

The Jones Falls Station operates under local PLC control. Control loop failure will not interrupt the normal operation of the station.

Jones Falls Station local control is provided by the station PLC. This system has multiple redundant features. In the unlikely event of complete PLC failure, the station will operate on bubbler tube level control.

In the event of PLC failure, the station shall be staffed until the PLC has been restored to operation.

## 5.2.5 Locust Point Pumping Station

**Directions for Police/Fire/EMS Dispatch:** 2290 E. Fort Avenue, Baltimore. Access is via E. McComas Street to East Fort. Go through the security gate and continue 425 ft.. Turn right around the salt pile and continue for 260 ft. to a brick structure.

**Table I: Locust Point Pumping Station Data**

| Locust Point Station                           |  |
|--|--|
| Station Address:                               | 2290 East Fort Avenue, Baltimore MD 21230                        |
| Station Telephone No.                          | (410) 396-7290   |
| First Likely SSO Point                         | First manhole in front of the station                            |
| Storage Capacity                               | Approximately 45,000 gallons (wet well); limited in-line storage |
| Est. Generator Run Time:                       | Approximately 2 ½ days   |
| Influent Flow Rate                             | Estimated Storage Time   |
| Minimum: approximately 23,000 GPD <sup>a</sup> | Approximately six hours  |
| Average: approximately 131,000 GPD             | Approximately four hours   |
| Maximum: 3.0 MGD                               | Approximately one hour   |

<sup>a</sup> GPD – Gallons per Day

- **Note:** Transportation Worker Identification Card required for site access.
- **Station:** The station is monitored by SCADA system.
- **Power:** Station is equipped with emergency generator and ATS for station service. Gas detection system, with alarm visible outside the station.
- **Pump:** Two alternating dry-pit submersible pumps. Any one pump has firm capacity to operate the station.
- **Emergency bypass availability:** Portable pumps can be used to pump from wet well to the nearest gravity sewer manhole. The wet well may be accessed from outside the station at the wet well hatch. However, bypassing the entire station using portable pumps is feasible. If the 10-in. force main is operational, a portable bypass pump may be discharged to a tee fitting installed on the force main on the pump deck. This will require a six-in. 150# connection to the flange.
- **Likely collection system overflow point:** Gravity manhole immediately north and in front of the station.

## Electrical Fault

1. Does the station have power?
  - Verify the station has power on all three phases by checking using a meter at the main circuit breaker. Voltage should read 480 volts +/- on all three phases. If power is not present on all three phases, immediately request an electrician to respond.
  - Loss of any or all phases should automatically start the station generator and transfer load. It is possible to manually start the generator at the generator control panel, and manually transfer load at the ATS. Directions for this procedure are in the Locust Point Station O&M Manual.
2. Do the pumps and auxiliary equipment have power?
  - Check that all circuit breakers are closed at the MCC. Branch circuit breakers for auxiliary equipment are also located at the MCC.
  - The pump motor soft starters may be manually bypassed.

## Mechanical Fault

1. Is the dry well flooded?
  - Inspect the pump deck. Any appreciable amount of water indicates a pipe break or equipment leak. If necessary, stop all sewage pumps and allow the sump pump to dewater the dry well. In most cases, it should be possible to isolate the leak or break by closing the appropriate valves and re-starting the station.
2. Is there a high wet well alarm, with or without a collection system SSO?
  - This indicates that the sewage pumps are not operating or are not conveying sufficient flow to the force main. If none of the pumps are operating and three-phase power is available, attempt manual start of any one pump at the MCC.
  - If the pump motor(s) are drawing current and no/low flow is still indicated on the station flowmeter, investigate valve positions, including check and isolation valves.
  - Because the Locust Point Station has no screening for solids, investigate possible ragging of the pump volute, discharge line, or check valves.
  - Investigate possible failure of the bubbler tube level control system, including a blocked bubbler tube.
  - Attempt to return at least one pump to service.
3. Is there a low wet well alarm, with or without a collection system SSO?
  - Verify the 12-in. wet well isolation sluice gate is in the open position. If there appears to be little flow entering the station, begin checking upstream manholes for either a break or obstruction in the gravity sewer upstream of the station.

**Instrumentation and Control Fault**

Alarm conditions reported via SCADA or station alarm are self-explanatory. See the Locust Point Station O&M Manual for troubleshooting and repair of specific systems.

**Note:** A failure of the bubble tube level control system will disable this station.

Any pump may be started manually at the MCC if the bubbler tube system is not operating.

The Locust Point Station operates under local control. Control loop failure will not interrupt the normal operation of the station.

Locust Point Station local control is provided by the station PLC. This system has multiple redundant features. If the PLC fails, the station should be staffed continuously until the PLC is returned to service.

## 5.2.6 Quad Avenue Pumping Station

**Directions for Police/Fire/EMS Dispatch:** 701 S. North Point Road, Baltimore. Brick structure on the north side of Quad Avenue at the intersection of North Point Boulevard.

**Table J: Quad Avenue Pumping Station Data**

| Quad Avenue Station            |   |
|--------------------------------|---|
| Station Address:               | 701 North Point Road, Baltimore, MD 21224                               |
| Station Telephone No.          | (410) 396-6077  |
| First Likely SSO Point         | 62nd Street, Moore's Run side, and past the 62nd Street pumping station |
| Storage Capacity               | Approximately 150,000 gallons; including in-line storage                |
| Est. Generator Run Time:       | Approximately 1 ½ days  |
| Influent Flow Rate             | Estimated Storage Time  |
| Minimum: 2.21 MGD              | Approximately one hour, 15 minutes                                      |
| Average: 2.40 MGD              | Approximately one hour  |
| Maximum: 24.2 MGD <sup>a</sup> | Approximately nine minutes  |

<sup>a</sup> Highest flow recorded

- **Station:** The station is monitored by SCADA system.
- **Power:** Station is equipped with emergency generator and ATS for station service.
- **Pumps:** Two pumps and third standby/wet weather pump available.
- **Force main failure:** A 20-in. bypass connection is provided on pump discharge manifold for connection to temporary piping. A temporary force main may not be an option due to the distance to the nearest gravity sewer manhole (approximately 1 mile west of the station on North Point Boulevard).
- **Emergency bypass availability:** Portable pump discharge line can be connected to the 20-in. flanged bypass connection on pump discharge outside the station.
- **Likely collection system overflow point:** First SSO will occur from a manhole located on the Moore's Run low-level interceptor at 62nd Street.

### Electrical Fault

1. Does the station have power?
  - Verify the station has utility power present on all three phases of the three-phase service. This can be done by checking the display on the utility meter located on the switchgear. If power is not present on all three phases, immediately request an electrician to respond.
  - Loss of one of three phases may, or may not, cause the generator to start and the ATS to transfer load from utility power to generator power. In an emergency situation involving loss of one or more phases of the utility power, and the generator has not started automatically, manually start the generator and transfer

load using the controls on the ATS. This procedure is described in the Quad Avenue Station O&M Manual.

2. Do the pumps and auxiliary equipment have power?
  - Check that all circuit breakers are closed at the MCC. In the unlikely event both the radar and bubbler wet well level controls are disabled, pumps can be started manually at the VFDs if three-phase power is available at the MCC.
  - Check for power for single-phase 120-volt loads at Panel A.
  - Attempt manual start of any one pump.
  - After starting pump, verify that the pump cone valve has opened.

### **Mechanical Fault**

1. Is the drywell flooded?
  - Visually check the pump deck. Any appreciable amount of water indicates a pipe break or equipment leak. If necessary, stop all sewage pumps and allow the sump pump to dewater the dry well. In most cases it should be possible to isolate the leak or break by closing the appropriate valves and re-starting the station.
  - Check that the dry well pump out valve is closed.
  - The drywell may also be dewatered by opening the dry well pump out valve and manually starting Pump #1.
2. Is there a high wet well alarm, with or without a collection system SSO?
  - This indicates that the sewage pumps are not operating, are not conveying sufficient flow to the force main, or discharge valve is stuck/closed. If none of the pumps are operating and three-phase power is available, check the wet well level control systems. If both are inoperative, sewage pumps may be started manually at the VFDs.
  - If the pump motors are running, investigate valve positions, including the pump cone valves. Investigate suction line obstructions (uncommon, but possible). Attempt to return at least one pump to service.
3. Is there a low wet well alarm, with or without a collection system SSO?
  - Investigate the bar screen. If it is blocked and cannot promptly be returned to service, isolate and bypass screening equipment using the procedure in the Quad Avenue Station O&M Manual.
  - Bypass the screening channel only as a last resort. Solids in unscreened wastewater will eventually cause ragging of the pump volutes and pump failure.
  - If the bar screen is operating and there is low flow in the influent channel, investigate both upstream gravity interceptor sewers for a break or obstruction.

**Instrumentation and Control Fault**

Alarm conditions reported via SCADA or station alarm are self-explanatory. See the Quad Avenue Station O&M Manual for troubleshooting and repair of specific systems.

The Quad Avenue Station operates under local control. Control loop failure will not interrupt the normal operation of the station.

Quad Avenue Station local control is provided by the station PLC. This system has multiple redundant features. In the unlikely event of complete PLC failure, the station will default to operating on the bubbler tube wet well level control system. If the PLC fails, the station should be staffed continuously until the PLC is returned to service.

### 5.2.7 McComas Street Pumping Station

**Directions for Police/Fire/EMS Dispatch:** 1800 Key Highway, Baltimore. One story brick structure located under the overpass of I-95 North, near the intersection of Key Highway and E. McComas Street.

**Table K: McComas Street Pumping Station Data**

| McComas Street Station                          |  |
|---|--|
| Station Address:                                | 1800 Key Highway, Baltimore MD 21230   |
| Station Telephone No.                           | (410) 396-3449   |
| First Likely SSO Point                          | Baltimore Gas & Electric (BGE) grass area near the marine terminal and manholes along McComas St. South of I-95. |
| Storage Capacity                                | Approximately 21,000 gallons (wet well); limited in-line storage   |
| Est. Generator Run Time:                        | Approximately 3 ½ days continuous service  |
| Influent Flow Rate <sup>a</sup>                 | Estimated Storage Time   |
| Minimum: approximately 20,000 GPD               | Approximately five hours   |
| Average: approximately 47,000 GPD               | Approximately three hours  |
| Maximum: approximately 443,000 GPD <sup>a</sup> | Approximately one hour   |

<sup>a</sup> Highest flow recorded

- **Station:** The station is monitored by SCADA system.
- **Power:** The station is equipped with emergency generator and ATS for station service. Gas detection system, with alarm/gas concentrations visible outside the station.
- **Pumps:** Two duty and one standby/ wet weather pumps are available. All units are identical submersible dry-pit pumps.

**Note:** Although the pumps are fully submersible, their electrical connections are not. Flooding of the drywell to a depth of six ft. or greater will likely disable all three sewage pumps.

- **Force main:** Two parallel force mains (six-in. and 10-in.) discharging to the same point are available. The 10-in. force main is normally in service, with chain-operated valves located on the pump deck.
- **Emergency bypass availability:** A six-in. emergency bypass connection is provided on the six-in. force main outside the pump station. The nearest gravity sewer is located on Key Highway approximately 900 ft. from the station. The wet well can be dewatered by vacuum truck by removing the trash basket from the hatch immediately outside the station.

- **Likely collection system overflow point:** The BG&E property, grass area near the Marine Terminal and manholes along McComas St. south of Interstate 95.

### Electrical Fault

1. Does the station have power?
  - Verify the station has power on all three phases by checking using a meter at the main circuit breaker. Voltage should read 208 volts +/- on all three phases. If power is not present on all three phases, immediately request an electrician to respond.
  - Loss of any or all phases should automatically start the station generator and transfer load. It is possible to manually start the generator at the generator control panel, and manually transfer load at the ATS. Directions for this procedure are in the McComas Street Station O&M Manual.
2. Do the pumps and auxiliary equipment have power?
  - Check that all circuit breakers are closed at the MCC. Branch circuit breakers for 120-volt auxiliary equipment are also located at the MCC.
  - The pump motor soft starters may be manually bypassed in the event of drive fault.

### Mechanical Fault

1. Is the dry well flooded?
  - Inspect the pump deck. Any appreciable amount of water indicates a pipe break or equipment leak. If necessary, stop all sewage pumps and allow the sump pump to dewater the dry well. In most cases it should be possible to isolate the leak or break by closing the appropriate valves and re-starting the station.
  - Inspect the pump electrical junction boxes on the pump deck. If these have been submerged, do not attempt to start the sewage pumps until these connections have been inspected by a qualified electrician. If it is not possible to restart the sewage pumps without extensive electrical repairs, begin the provision of temporary bypass pumping using portable pumps.
2. Is there a high wet well alarm, with or without a collection system SSO?
  - This indicates that the sewage pumps are not operating, are not conveying sufficient flow to the force main, or discharge valve is stuck/closed. If none of the pumps are operating and three-phase power is available, attempt manual start of any one pump at the MCC.
  - If the pump motor(s) are drawing current and no/low flow is still indicated on the station flowmeter, investigate valve positions, including check and isolation valves.

- Investigate possible failure of the bubbler tube level control system, including a blocked bubbler tube.
  - Attempt to return at least one pump to service.
3. Is there a low wet well alarm, with or without a collection system SSO?
- Investigate the trash basket outside the station. Lift using the hand winch and remove solids as necessary. In an emergency, the station may be operated with the trash basket removed, but this will eventually lead to obstruction of the pump volutes and discharge lines with solids.
  - If the trash basket is clean and there appears to be little flow entering the station, begin checking upstream manholes for either a break or obstruction in the gravity sewer upstream of the station.

#### **Instrumentation and Control Fault**

Alarm conditions reported via SCADA or station alarm are self-explanatory. See the McComas Station O&M Manual for troubleshooting and repair of specific systems.

**Note:** A failure of the bubble tube level control system will disable this station.

The wet well floats are for alarm only and will not operate the sewage pumps. Any pump may be started manually at the MCC if the bubbler tube system is not operating.

The McComas Station operates under local control. Control loop failure will not interrupt the normal operation of the station.

McComas Station local control is provided by the station PLC. This system has multiple redundant features. If the PLC fails, the station should be staffed continuously until the PLC is returned to service.

### 5.2.8 Westport Pumping Station

**Directions for Police/Fire/EMS Dispatch:** 2911 Waterview Ave, Baltimore. On Waterview, at intersection of Cherry Hill Road. One story brick structure on the north side of the intersection.

**Table L: Westport Pumping Station Data**

| Westport Station                  |  |
|-----------------------------------|--|
| Station Address:                  | 2911 Waterview Ave. Baltimore MD 21230   |
| Station Telephone No.             | (410) 396-7289   |
| First Likely SSO Point            | Wet well, flowing to storm drain on Waterview Ave as well as manhole at intersection of Waterview Ave. and Cherry Hill Rd. |
| Storage Capacity                  | Approximately 10,500 gallons (wet well); limited in-line storage   |
| Est. Generator Run Time:          | Two to 2 ½ days continuous service   |
| Influent Flow Rate                | Estimated Storage Time   |
| Minimum: 50,000 GPD               | Approximately four hours   |
| Average: 77,500 GPD               | Approximately three hours  |
| Maximum: 134,000 GPD <sup>a</sup> | Approximately 1 ½ hours  |

<sup>a</sup> Highest flow recorded

- **Station:** The station is monitored by SCADA system.
- **Power:** The station is equipped with emergency generator and ATS for station service.
- **Pumps:** Two duty and one standby/wet weather pumps are available. All units are identical submersible dry-pit pumps.
- **Force main:** Station has a very short (~200-foot) force main, discharging to a structure on the southwest corner of Waterview Avenue and Cherry Hill Road. It is feasible to provide portable pumping and a temporary force main.
- **Emergency bypass availability:** Emergency bypass connection is not available on the force main. Because of the very short force main, a portable pump and bypass hose could be deployed. The bypass hose would need to cross Waterview Ave, so some means of protection (road plates, etc.) would be required. A police traffic detail would be required to implement this plan.
- **Likely collection system overflow point:** The station wet well and the first gravity manhole structure upstream of the station (located immediately south of the station within the fence) as well as manhole at intersection of Waterview Ave. and Cherry Hill Rd.

## Electrical Fault

1. Does the station have power?
  - Verify the station has power on all three phases by checking the metering on the ATS or MCC. Voltage should read 480 volts +/- on all three phases.
  - If power is not present on all three phases, immediately request an electrician to respond. Loss of any or all phases should automatically start the station generator and transfer load.
  - It is possible to manually start the generator at the generator control panel, and manually transfer load at the ATS. Directions for this procedure are in the Westport Station O&M Manual.
2. Do the pumps and auxiliary equipment have power?
  - Check that all circuit breakers are closed at the MCC. Branch circuit breakers for auxiliary equipment are also located at the MCC. The pump motor soft starters may be manually bypassed.

## Mechanical Fault

1. Is the dry well flooded?
  - Using a portable gas detector, go below and inspect the pump deck. Any appreciable amount of water indicates a pipe break or equipment leak.
  - If necessary, stop all sewage pumps and allow the sump pump to dewater the dry well. In most cases it should be possible to isolate the leak or break by closing the appropriate valves and re-starting the station.
2. Is there a high wet well alarm, with or without a collection system SSO?
  - This indicates that the sewage pumps are not operating, are not conveying sufficient flow to the force main, or the discharge valve is stuck/closed. If none of the pumps are operating and three-phase power is available, attempt manual start of any one pump at the MCC.
  - If the pump motor(s) are drawing current and no/low flow is still indicated on the station flowmeter, investigate valve positions, including check and isolation valves.
  - Investigate possible failure of the bubbler tube level control system, including a blocked bubbler tube.
  - Attempt to return at least one pump to service.
3. Is there a low wet well alarm, with or without a collection system SSO?
  - Investigate the bar screen. If it is fouled and not operating, first check the bar screen circuit breaker at the MCC. In an emergency, the screen channel may be bypassed directly to the wet well. This procedure is described in the Westport Station O&M Manual.

- If the bar screen is clean and there appears to be little flow entering the station, begin checking upstream manholes for either a break or obstruction in the gravity sewer upstream of the station.

### **Instrumentation and Control Fault**

Alarm conditions reported via SCADA or station alarm are self-explanatory. See the Westport Station O&M Manual for troubleshooting and repair of specific systems.

The Westport Station operates under local control. Control loop failure will not interrupt the normal operation of the station.

Westport Station local control is provided by the station PLC. This system has multiple redundant features. In the unlikely event of complete PLC failure, the station will default to operating on the bubbler tube wet well level control system. If the PLC fails, the station should be staffed continuously until the PLC is returned to service.

### 5.2.9 Stony Run Pumping Station

**Directions for Police/Fire/EMS Dispatch:** 2842 Sisson Street, Baltimore. Southwest corner of Sisson and W. 29th Streets. Access station via solid waste transfer facility driveway on 2840 Sisson St.

**Table M: Stony Run Pumping Station Data**

| Stony Run Station               |  |
|---------------------------------|--|
| Station Address:                | 2840 Sisson Street, Baltimore MD 21211                                     |
| Station Telephone No.           | (410) 243-1326   |
| First Likely SSO Point          | None; station bypasses by gravity  |
| Storage Capacity                | Approximately 20,000 gallons (wet well); 210,000 gallons (in-line storage) |
| Est. Generator Run Time:        | Approximately 11 hours   |
| Influent Flow Rate <sup>a</sup> | Estimated Storage Time   |
| Minimum: 3.0 MGD                | N/A <sup>a</sup>   |
| Average: 7.0 MGD                | N/A <sup>a</sup>   |
| Maximum: 17.0 MGD               | Approximately 20 minutes <sup>b</sup>                                      |

<sup>a</sup> The station is a wet-weather station and during dry weather all incoming flow passes (by gravity) through the 24-in. Lower Stony Run Interceptor to Lower Jones Falls Interceptor.

<sup>b</sup> This storage time is reflects a condition when the gate valve on 24-in. Lower Stony Run Interceptor is closed and no flow passes through the Station. If the gate valve is open, the Station will not cause overflow upstream, rather the overflow may be downstream from Lower Jones Falls Interceptor.

- **Note:** During wet weather, station can receive flows from the 60-in. Stony Run Interceptor sewer and pump to the Jones Fall force main. Dry-weather flows normally bypass station west to the 24-in. Stony Run Interceptor.
- **Station:** The station is monitored by SCADA system.
- **Power:** Station is equipped with emergency generator and ATS for station service.
- **Pump:** Four pumps are available – two pumps provide station capacity of 17 MGD.
- **Force main failure:** Station can safely remain offline in dry-weather conditions. Bypass connection not provided on the station force main.
- **Emergency bypass availability:** Station can be bypassed by gravity. In an emergency, the wet well could be dewatered (using portable pumps) to the gravity manhole on the 24-in. Stony Run interceptor approximately 25 ft. west of the station concrete apron.
- **Likely collection system overflow point:** During very high wet-weather flows, structures along the Falls Road Interceptor may surcharge. There have been no known overflows from upstream collection system manholes.

## Electrical Fault

1. Does the station have power?
  - Verify the station has utility power present on all three phases of the three-phase service. This can be done by checking the display on the utility meter located on the switchgear. If power is not present on all three phases, immediately request an electrician to respond.
  - Loss of one of three phases may, or may not, cause the generator to start and the ATS to transfer load from utility power to generator power. In an emergency situation involving loss of one or more phases of the utility power, and the generator has not started automatically, manually start the generator and transfer load using the controls on the ATS. Follow the procedure described in the Stony Run O&M Manual.
2. Do the pumps and auxiliary equipment have power?
  - Check that all circuit breakers are closed at the MCC. In the unlikely event both the radar and float switch wet well level controls are disabled, pumps can be started manually at the VFDs as long as three-phase power is available at the MCC. Before manually starting any pump, verify the pump volute is full of water by first cracking the one-in. ball air release valve. After starting pump, verify that the pump plug valve has opened.
  - Check for power for single-phase 120 V loads at Panel 1. Loss of power to the PLC and related instrumentation will disable the station.

## Mechanical Fault

1. Is the dry well flooded?
  - Visually check the pump deck. Any appreciable amount of water indicates a pipe break or equipment leak. If necessary, first isolate the wet well using the electrically operated sluice gate. Pumps #1 and #4 are furnished with dry well dewatering connections on the suction side of these pumps. See the station O&M manual for valve positions required to dewater the wet well. In the event the suction side valves are submerged, it may be necessary to dewater the dry well using portable pumps.
  - Inspect the surge valve and related piping. A leak or break in this equipment could flood the dry well.
  - Check the six-in. suction line valves on Pumps #1 and #2 for breakage or leaks. This piping is cantilevered off the individual pump suction lines and represents a potential failure point.
2. Is there a high wet well alarm, with or without a collection system SSO?
  - This indicates that the sewage pumps are not operating, are not conveying sufficient flow to the force main, or discharge valve is stuck/closed. If none of the pumps are operating and three-phase power is available, check the wet well level

control systems. If both are inoperative, sewage pumps may be started manually at the VFDs. If the pump motors are running, investigate valve positions, including the pump plug valves.

- First, check that the operating pumps are primed by slightly cracking the pump volute air release valve. Investigate for uncommon, but possible, suction line obstructions or breaks. Attempt to return at least one pump to service.

3. Is there a low wet well alarm, with or without a collection system SSO?

- Investigate the grinder channels. If one or the other is fouled or otherwise inoperative and cannot promptly be returned to service, see the Stony Run Station O&M Manual for maintenance procedures.
- If the grinder(s) are operating and there is low flow in the influent channel, investigate the 60-in. upstream gravity interceptor sewer for a break. Because of the large diameter and high wet-weather flow in the interceptor, an obstruction would be unlikely.

### Instrumentation and Control Fault

Alarm conditions reported via SCADA or station alarm are self-explanatory. See the Stony Run Station O&M Manual for troubleshooting and repair of specific systems.

The Stony Run Station operates under local PLC control. Control loop failure will not interrupt the normal operation of the station.

Stony Run Station local control is provided by the station PLC. This system has multiple redundant features. In the unlikely event of complete PLC failure, the station will not operate. In this case it is possible to operate the pumps manually via the VFD controls, with the understanding that the pumps are not operating under automatic wet well level control.

## 5.3 Response Guide for Force Main Emergencies

The purpose of this section is a guide to initiating an effective and timely response to situations common to operating sewage force mains. It is provided as general guidance and to help ensure an adequate response in emergency situations that cannot be anticipated or predicted.

Sewage force main failures have the potential to threaten human health and the environment and cause significant property damage. Force main failures can create a large SSO in a short period of time and have the potential to affect a larger section of the sewer service area than a gravity sewer blockage. Response to a force main failure may call upon every operational group within DPW having responsibility for O&M of the collection system, including the wastewater treatment plants.

Force main failures may result in serious spills requiring isolation of the force main segment to permit repair. In some cases, more than one pump station may be affected when a force main segment is taken out of service. The isolation of a damaged force main segment for repairs and

the rerouting of normal sewage flow requires shutdown of affected pump stations and the closing and opening of key valves at pump stations and on the force main segment to be isolated. This situation requires extremely careful planning of force main segment isolation procedures, affected pump station shutdown procedures, SSO containment/cleanup, and expeditious repair of the force main.

Force main failures can result from a variety of causes including accidental damage from excavation activities, pipe age, subsidence or washout of backfill, hydraulic surge, corrosion, or (most commonly) failure at an Air Release Valve (ARV) or buried fitting. Some actions that can be taken prior to an emergency include:

- Ensure that a qualified DPW representative is on site during any excavation by other City departments or private contractors taking place in the vicinity of gravity sewers or force mains.
- Organize and store emergency force main repair kits consisting of at least two lengths of pipe of the same material and diameter as the force main, along with several repair sleeves, couplings, restraining rods with hardware, etc. This ensures repair materials are available in the event of an emergency.
- Regularly inspect ARV structures, and verify that each ARV is furnished with an operating ball valve installed in series with the ARV. Remember that ARVs that become “stuck open” are the primary cause of most force main SSOs.

## **6.0 WATER QUALITY SAMPLING AND MONITORING**

### **6.1 General Information**

In the event of a confirmed SSO of 10,000 gallons or greater, or as otherwise directed by the Bureau Head, BCHD, EPA, or MDE, OCR will implement monitoring, sampling, and analysis to assess and report the impact of the SSO on receiving water quality. OCR's sampling and monitoring will determine if receiving waters have been adversely impacted by the SSO, i.e., whether there is any decrease in background levels of dissolved oxygen and any increase in background levels of turbidity, fecal coliform, total coliform, or other applicable bacteriological standards.

The presence (or absence) of adverse impact from an SSO does not determine whether surface water is safe for recreation. MDE has listed all surface waters in Baltimore City as impaired for bacteria. As such, receiving water quality may not meet applicable parameters for full-body contact recreation, independent of the impact of a specific SSO event. The City discourages full-body contact with surface water and posts temporary SSO notification signs to this effect. In addition, there are no designated locations in Baltimore City for full-body contact recreation in surface water. If City recreation programs may involve infrequent water contact, such as kayaking, participants are provided appropriate educational materials. Similar messages are also disseminated on City websites.

The SSO sampling program supplements ongoing monitoring programs conducted by the City under its National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System permit, specifically, the Ammonia Screening (AS) and Stream Impact Sampling (SIS) programs. The AS program consists of weekly surface water monitoring at over 80 locations throughout the City, using field test kits for ammonia-nitrogen, chlorine, potential hydrogen (pH), temperature, dissolved oxygen, and conductivity. The SIS program consists of monthly surface water sampling at over 30 locations within the City, using laboratory analysis for nutrients, sediment, bacteria, metals, and other water quality indicators. The SIS program has been ongoing since 1997, and the AS program has been ongoing since 1998. The results of the AS and SIS programs provide background levels for turbidity, dissolved oxygen, and bacteria. Additional information regarding these programs and their historical sampling results is available on the DPW website.

### **6.2 Water Quality Monitoring**

If an SSO is confirmed to meet or exceed 10,000 gallons, the Wastewater General Superintendent will notify the OCR Water Quality Monitoring and Investigation (WQMI) Section to initiate SSO sampling. Upon notice, the OCR-WQMI Section Chief will initiate water quality sampling according to the procedures specified herein. The OCR-WQMI Section Chief will act as the point of contact for the sampling event, provide coordination for laboratory analysis, and designate a field coordinator to oversee collection of samples.

## 6.3 Sampling Protocol

### 6.3.1 Sample Parameters

Samples collected as part of a response to an overflow event will be grab samples. Sampling parameters shall include:

- Field sampling:
  - Dissolved oxygen per Standard Method (SM) D988(C)
  - Turbidity per SM 2130 B
- Laboratory analysis (reference 40 CFR 136):
  - Five-day Biochemical Oxygen Demand (BOD) per SM 5210B
  - Total Suspended Solids (TSS) per SM 2540
  - Bacteriological standard:
    - E.coli Most Probable Number (MPN) count for non-tidal receiving waters per SM 9223 B, or:
    - Enterococci MPN count for tidal receiving waters per SM 9230 D

A Chain of Custody record shall accompany all samples for laboratory analysis. All samples collected will be identified on the Chain of Custody record with the sample date, time, volume, sampler, parameters to be analyzed, and the sample receiver.

All samples requiring laboratory analysis will be transported to the laboratory as soon as possible in coolers of ice and preserved according to the analytical method. Sample analyses will be performed within specified holding times for specific parameters. The holding time for bacteria (six hours) is most critical. Sampling may be limited by laboratory operation times; therefore, late afternoon sampling events should be limited. The laboratory shall indicate on the results records any analysis performed outside of the specified holding time.

### 6.3.2 Location and Schedule of Sampling

Sampling locations and schedule will be based on the Collection System asset that is overflowing, the receiving water(s), and the duration of the SSO event (i.e., if an SSO is not abated within five days). The sampling protocols are summarized in Table 6-1:

**Table N: Summary of Sampling Protocols**

| Protocol Type | Collection System Asset | Receiving water | Sampling Location      | Frequency   |
|---------------|-------------------------|-----------------|------------------------|---|
| 1             | Structured overflow     | Any             | Outfall <sup>a,b</sup> | Within one business day of notification                 |
| 2             | All other assets        | Tidal           | Outfall <sup>c</sup>   | Within one business day of notification; and within two |

| Protocol Type | Collection System Asset | Receiving water | Sampling Location  | Frequency  |
|---------------|-------------------------|-----------------|--|--|
|               |                         |                 |  | business days after abatement  |
| <b>3</b>      | All other assets        | Non-tidal       | Outfall, <sup>a</sup> upstream (200 ft.), and downstream (minimum 200 ft.) | Within one business day of notification<br>Two business days after the first sampling event<br>Weekly from the first sampling event until the SSO abatement is complete<br>Five business days after the SSO abatement is complete. |

- <sup>a</sup> Sample should be obtained from the flow within the outfall pipe. If no base flow is available, then sample the surface water at the outfall. If the outfall is not accessible, sample can be obtained from the surface water at the nearest accessible downstream location.
- <sup>b</sup> Surface waters at SSO structures typically discharging more than 10,000 gallons during an SSO are usually sampled as part of the SIS program.
- <sup>c</sup> If the outfall is not accessible, the sample may be obtained from the base flow within the pipe at the nearest upstream manhole as long as it is downstream from the SSO discharge to the storm system. Samples may be obtained from the tidal surface water at submerged outfalls.

### 6.3.3 Quality Assurance/Quality Control

All laboratories analyzing samples collected as part of this SSO monitoring shall have a current MDE-approved quality assurance plan and follow approved procedures for all analyses. The following Quality Assurance/Quality Control (QA/QC) samples shall be obtained and analyzed as follows:

- Duplicate samples shall be obtained from the same discrete sampling location throughout the SSO sampling duration and analyzed for bacteria and TSS. The precision of the method of analysis can be determined by the reproducibility of the results from the duplicate samples measured by the standard deviation of the duplicate samples.
- Blank samples shall consist of distilled water and shall be carried in the same cooler as the other surface water samples. One blank sample should be submitted for each qualifying SSO event and analyzed for bacteria and TSS. Blank samples should also be sampled in the field for turbidity. Blank samples should result in known values.

QA/QC samples shall be uniquely labeled and noted on the original field sheets. These samples will be submitted on the same Chain of Custody form as the other samples.

## 6.4 Reporting

Test results and analyses conducted pursuant to this ERP will be maintained by OCR and reported to EPA and MDE as provided below. The laboratory will ordinarily provide a final, written report within 10 business days of receiving samples. Within 14 days of receipt of the

laboratory report, the OCR-WQMI Section Chief will complete a written report that includes the following:

- Data from the 5-Day Report to MDE:
  - SSO identification number
  - Location of the SSO event
  - Notification date and abatement date of SSO event
  - Total SSO volume
  - Receiving water(s) (Eight-digit watershed)
- Collection System asset (SSO structure, etc.)
- Discharge location (outfall asset and tidal / non-tidal)
- If applicable, any deviation from the sampling protocol, and the reason(s) why
- Summary table of laboratory results (including dates and locations)
- Evaluation of QA/QC sample results
- Reference AS and SIS sampling locations, comparison to baseline conditions, and assessment of impact from the SSO event
- Sampling location map
- Chain of custody records
- Field sampling records
- Laboratory results

## 7.0 PREPAREDNESS TRAINING

The Preparedness Training Program was developed to familiarize appropriate personnel with the guidelines, procedures, and requirements for responding to emergencies within the Collection System. The training program ensures the preparedness of response and call center personnel by providing a detailed overview of the City's response procedures for sewage backup investigations, Building Backups, SSOs, and Call Center customer service guidelines.

Preparedness training for UMD personnel includes public safety awareness and sewage containment with response times, SSO response, overflow reports, and steps to prevent future SSOs. Additionally, UMD, Control One, and other DPW offices with related responsibilities participate in annual refresher training focused on the requirements of the City's ERP. Control One performs dispatch and assignment of SRs and Work Orders as described above. In contrast, 311 call operators' role is limited to asking a prescribed list of flex questions based on the SR type identified by the caller. The caller's response(s) (if any) are recorded in the SR before the SR is transferred to the CMMS. 311 call operator training is limited to asking these flex questions. As such, the ERP training for call center personnel is limited to Control One.

Lesson plans are included in Tables 7-1, 7-2, and 7-3.

**Table O: Preparedness Training – ERP**

|                      |  |
|----------------------|--|
| <b>Purpose</b>       | To provide management and response personnel with an understanding of the ERP  |
| <b>Duration</b>      | Four hours   |
| <b>Objective</b>     | <p>At the conclusion of this training program, the participants should be able to:</p> <ul style="list-style-type: none"> <li>• Describe the requirements of Paragraph 16 of the MCD</li> <li>• Interpret the contents of the ERP</li> <li>• Locate and identify those specific actions and procedures necessary to implement the plan in a timely and effective manner</li> <li>• Understand response priorities and chain of command</li> <li>• Identify specific individuals and their responsibilities</li> <li>• Identify resources and their locations</li> </ul>                      |
| <b>Audience</b>      | <p>Utility Maintenance Division Supervisors, Superintendents, Investigators and crews; Pollution Control Analysts; Public Information Officers; BCHD; and, as appropriate, employees from the following Offices in DPW:</p> <ul style="list-style-type: none"> <li>• OAM</li> <li>• OEC</li> <li>• Office of Compliance and Laboratories (OCAL)</li> <li>• Control One</li> </ul>  |
| <b>Training Aids</b> | Handouts and PowerPoint presentations  |
| <b>References</b>    | ERP  |
| <b>Topics</b>        | <ul style="list-style-type: none"> <li>• Overview of the ERP</li> <li>• Review decision charts</li> <li>• Internal notification procedures</li> <li>• SDUO notification procedures</li> <li>• Pumping station emergency response procedures</li> <li>• Force main emergency response procedures</li> <li>• Siphon emergency response procedures with locations of blow-offs</li> <li>• Collection System emergency response procedures</li> <li>• Water quality sampling and monitoring</li> <li>• Public notification procedures</li> <li>• Incident reporting and documentation</li> </ul> |

**Table P: Preparedness Training – SSOs**

|                      |   |
|----------------------|---|
| <b>Purpose</b>       | To familiarize participants with the SOP for investigating, abating, reporting, and following up on SSOs  |
| <b>Duration</b>      | Four hours  |
| <b>Objective</b>     | At the end of the class, participants will be able to utilize the procedures in the SOP effectively when dealing with SSOs.   |
| <b>Audience</b>      | Utility Maintenance Division Supervisors, Superintendents, Investigators and crews; Pollution Control Analysts; Public Information Officers; BCHD; and, as appropriate, employees from the following Offices in DPW: <ul style="list-style-type: none"> <li>• OAM</li> <li>• OEC</li> <li>• OCAL</li> <li>• Control One</li> </ul>  |
| <b>Training Aids</b> | Handouts and PowerPoint presentation  |
| <b>References</b>    | ERP Sections 3 through 6  |
| <b>Topics</b>        | <ul style="list-style-type: none"> <li>• Understanding the SOP</li> <li>• Fielding the complaint from citizens</li> <li>• Creating SRs</li> <li>• Dispatching work to crews</li> <li>• Creating Work Orders</li> <li>• Notifying the appropriate regulatory agencies with preliminary SSO information and potential impacts</li> <li>• Protecting public health and establishing SSO perimeters and control zones</li> <li>• Containing the SSO</li> <li>• Follow-up investigations and preventative steps</li> <li>• Estimating SSO flow and volume</li> <li>• Establishing an SSO timeline for the duration of the event</li> </ul> |

**Table Q: Preparedness Training – Building Backups**

|                      |   |
|----------------------|---|
| <b>Purpose</b>       | To familiarize participants with the SOP for investigating, abating, reporting, and following up on Building Backups  |
| <b>Duration</b>      | Four hours  |
| <b>Objective</b>     | At the end of the class, participants will be able to use the requirements of the SOP when investigating and addressing Building Backups.   |
| <b>Audience</b>      | Utility Maintenance Division Supervisors, Superintendents, Investigators and crews; Public Information Officers; BCHD; and, as appropriate, employees from the following Offices in DPW: <ul style="list-style-type: none"> <li>• OAM</li> <li>• OEC</li> <li>• Control One</li> </ul>  |
| <b>Training Aids</b> | Handouts and PowerPoint presentation  |
| <b>References</b>    | ERP Section 2   |
| <b>Topics</b>        | <ul style="list-style-type: none"> <li>• Understanding the SOP</li> <li>• Fielding the complaint from citizens</li> <li>• Creating SRs</li> <li>• Distribution of informational material during investigations</li> <li>• Dispatching work to crews</li> <li>• Creating Work Orders</li> <li>• Addressing acute or catastrophic failures in Collection System laterals</li> <li>• Protecting public health and providing customers with useful information</li> </ul> |

## 8.0 DOCUMENT CONTROL

This section describes the standard procedure(s) for control, periodic evaluation, and revision of the ERP.

### 8.1 ERP Locations

Copies of the ERP are issued to a number of specific users, as outlined below. The number of copies is limited to the extent possible in order to facilitate document control and revision.

#### 8.1.1 Working Copies

A complete set of the ERP and all appendices will be maintained in both hard copy and electronic format at the following locations:

- Park Terminal
- West Side Maintenance Yard
- East Side Maintenance Yard
- All Pumping Stations
- Treatment Plants (Back River and Patapsco)
- Office of Legal and Regulatory Affairs at Abel Wolman Building

#### 8.1.2 Executive and Managers Copies

Complete copies of the ERP will be issued to a number of City managers who may be directly involved with an emergency response. These include:

- Chief of Staff, Mayor's Office
- Director, DPW
- Bureau Head, BWW
- Chief, OCSA
- Division Chief, Utility Maintenance
- Chief, OCAL
- Chief, OEC
- Chief, OAM
- Division Chief, Information Technology (IT)
- Section Head, Water Quality Monitoring and Illicit Discharge Detection and Elimination (IDDE)
- Operations Manager, Wastewater Pumping Stations

- Operations Supervisor, Wastewater Pumping Stations
- Wastewater General Superintendent, UMD
- Managers, Back River and Patapsco Treatment Plants

## **8.2 Document Control**

Hard copies and electronic copies of the ERP, and subsequent revisions thereto, are provided to those listed in Section 8.1.2. Each plan holder is responsible for maintaining their respective copy and incorporating revisions as they are issued, typically annually. A read-only electronic version of the complete and up-to-date ERP is also provided annually.

## **8.3 ERP Review and Revisions**

The ERP is subject to periodic reviews and revisions. Revisions will be necessary to reflect changes in policy, regulatory requirements, response personnel, or facilities, or to capture improvements to emergency response procedures. Although revisions may be issued at any time to incorporate significant or urgent changes, the ERP undergoes a formal review on an annual basis and stays in effect until the annual review has been approved.

Maintenance of the ERP and issuance of revisions are the responsibility of the Chief of OAM. All noted corrections, requested changes, or information to be added or deleted to the ERP should be reported to Chief of OAM for inclusion in the next revision. The Chief of OAM conducts the annual review of the ERP in consultation with all users.

All pages, charts, maps, etc. included in the ERP are numbered, dated, and noted with a revision number. Any sections affected by a revision will be appropriately noted, and the Chief of OAM will circulate copies of these revised pages to all plan holders.

## ATTACHMENT A

The formula for SSO volume is:

$$\text{SSO VOLUME} = (\text{FLOW RATE in Gallons per Minute [GPM]}) \times (\text{LENGTH OF TIME in MINUTES})$$

The following metrics are measured to aid in the process of SSO volume estimation:

- **Start Time** - The start time commences when the SSO is confirmed by the First Responder.
- **Stop Time** - The stop time is when there is no longer any verifiable discharge from the Collection System. This may occur as a result of DPW actions taken or because of a change of flow, inflow, and infiltration to the Collection System.

**Note:** If the SSO restarts, “Intermittent Flow” will be recorded with the start/stop times.

- **Estimate of the Flow Rate**

Flow rates can be estimated using one or a combination of the following methods:

1. Observe and record manhole overflow (with cover removed) – Completely remove manhole cover from overflowing manhole and measure height of water above the manhole frame. The height of flow should be measured at various locations around the frame with an average of these measurements used to convert into flow rate based on Table A-1.
2. Observe and record manhole overflow (with cover in place) – With the manhole cover in place, measure the height of overflow from the pick hole on the manhole. The height of the flow from the pick hole can be used to convert into flow rate based on Table A-2.
3. Observe and record overflow of wastewater into controlled container - If the overflow is being discharged to a storm sewer, and the overflow accounts for most of the flow into the storm sewer, it may be possible to measure the flow rate directly. This method is limited to flow rates of approximately 20 gallons per minute or less and requires a free discharging storm sewer with adequate space below the pipe invert to position a plastic bucket of known volume (two to five gallons). As the bucket of a known volume captures the discharge, a stopwatch is used to determine the length of time required to fill the bucket. All necessary safety precautions should be taken to prevent contact with raw sewage.

**Table R-1: Method 1 for Flow Rate Estimation**

**ESTIMATED SSO FLOW OUT OF A M/H WITH COVER REMOVED**

| 24" FRAME                                  |              | 30" FRAME                                  |              | 36" FRAME                                  |              |
|--|--------------|--|--------------|--|--------------|
| Water height above manhole frame in inches | SSO FLOW gpm | Water height above manhole frame in inches | SSO FLOW gpm | Water height above manhole frame in inches | SSO FLOW gpm |
| 1/8  | 28           | 1/8  | 39           | 1/8  | 49           |
| 1/4  | 62           | 1/4  | 87           | 1/4  | 111          |
| 3/8  | 111          | 3/8  | 149          | 3/8  | 187          |
| 1/2  | 160          | 1/2  | 216          | 1/2  | 271          |
| 5/8  | 215          | 5/8  | 288          | 5/8  | 361          |
| 3/4  | 354          | 3/4  | 406          | 3/4  | 458          |
| 7/8  | 569          | 7/8  | 563          | 7/8  | 556          |
| 1  | 799          | 1  | 730          | 1  | 660          |
| 1 1/8                                      | 1,035        | 1 1/8                                      | 1,035        | 1 1/8                                      | 1,035        |
| 1 1/4                                      | 1,340        | 1 1/4                                      | 1,413        | 1 1/4                                      | 1,486        |
| 1 3/8                                      | 1,660        | 1 3/8                                      | 1,806        | 1 3/8                                      | 1,951        |
| 1 1/2                                      | 1,986        | 1 1/2                                      | 2,205        | 1 1/2                                      | 2,424        |
| 1 5/8                                      | 2,396        | 1 5/8                                      | 2,650        | 1 5/8                                      | 2,903        |
| 1 3/4                                      | 2,799        | 1 3/4                                      | 3,091        | 1 3/4                                      | 3,382        |
| 1 7/8                                      | 3,132        | 1 7/8                                      | 3,525        | 1 7/8                                      | 3,917        |
| 2  | 3,444        | 2  | 3,951        | 2  | 4,458        |
| 2 1/8                                      | 3,750        | 2 1/8                                      | 4,375        | 2 1/8                                      | 5,000        |
| 2 1/4                                      | 3,986        | 2 1/4                                      | 4,771        | 2 1/4                                      | 5,556        |
| 2 3/8                                      | 4,215        | 2 3/8                                      | 5,167        | 2 3/8                                      | 6,118        |
| 2 1/2                                      | 4,437        | 2 1/2                                      | 5,601        | 2 1/2                                      | 6,764        |
| 2 5/8                                      | 4,569        | 2 5/8                                      | 5,986        | 2 5/8                                      | 7,403        |
| 2 3/4                                      | 4,687        | 2 3/4                                      | 6,330        | 2 3/4                                      | 7,972        |
| 2 7/8                                      | 4,799        | 2 7/8                                      | 6,660        | 2 7/8                                      | 8,521        |
| 3  | 4,910        | 3  | 6,986        | 3  | 9,062        |

This estimating table was developed using tables in the Sewer Spill Estimation Guide, Orange County Area Waste Discharge Requirements Steering Committee, Orange County, CA. February 2014.

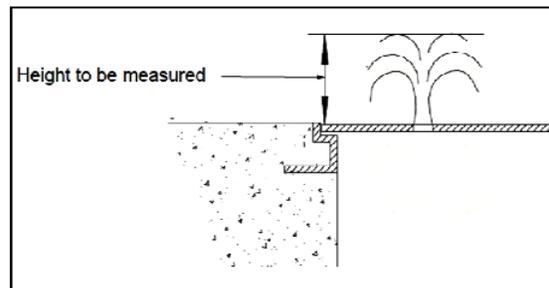
**Table R-2: Method 2 for Flow Rate Estimation**

| H (in.) | Q (GPM) |
|---------|---------|---------|---------|---------|---------|---------|---------|
| 1/8     | 1.0     | 2 5/8   | 4.4     | 5 1/8   | 6.2     | 7 5/8   | 7.6     |
| 1/4     | 1.4     | 2 3/4   | 4.5     | 5 1/4   | 6.3     | 7 3/4   | 7.6     |
| 3/8     | 1.7     | 2 7/8   | 4.6     | 5 3/8   | 6.3     | 7 7/8   | 7.7     |
| 1/2     | 1.9     | 3.0     | 4.7     | 5 1/2   | 6.4     | 8.0     | 7.7     |
| 5/8     | 2.2     | 3 1/8   | 4.8     | 5 5/8   | 6.5     | 8 1/8   | 7.8     |
| 3/4     | 2.4     | 3 1/4   | 4.9     | 5 3/4   | 6.6     | 8 1/4   | 7.9     |
| 7/8     | 2.6     | 3 3/8   | 5.0     | 5 7/8   | 6.6     | 8 3/8   | 7.9     |
| 1.0     | 2.7     | 3 1/2   | 5.1     | 6.0     | 6.7     | 8 1/2   | 8.0     |
| 1 1/8   | 2.9     | 3 5/8   | 5.2     | 6 1/8   | 6.8     | 8 5/8   | 8.0     |
| 1 1/4   | 3.1     | 3 3/4   | 5.3     | 6 1/4   | 6.8     | 8 3/4   | 8.1     |
| 1 3/8   | 3.2     | 3 7/8   | 5.4     | 6 3/8   | 6.9     | 8 7/8   | 8.1     |
| 1 1/2   | 3.4     | 4.0     | 5.5     | 6 1/2   | 7.0     | 9.0     | 8.2     |
| 1 5/8   | 3.5     | 4 1/8   | 5.6     | 6 5/8   | 7.0     | 9 1/8   | 8.3     |
| 1 3/4   | 3.6     | 4 1/4   | 5.6     | 6 3/4   | 7.1     | 9 1/4   | 8.3     |
| 1 7/8   | 3.7     | 4 3/8   | 5.7     | 6 7/8   | 7.2     | 9 3/8   | 8.4     |
| 2.0     | 3.9     | 4 1/2   | 5.8     | 7.0     | 7.2     | 9 1/2   | 8.4     |
| 2 1/8   | 4.0     | 4 5/8   | 5.9     | 7 1/8   | 7.3     | 9 5/8   | 8.5     |
| 2 1/4   | 4.1     | 4 3/4   | 6.0     | 7 1/4   | 7.4     | 9 3/4   | 8.5     |
| 2 3/8   | 4.2     | 4 7/8   | 6.0     | 7 3/8   | 7.4     | 9 7/8   | 8.6     |
| 2 1/2   | 4.3     | 5.0     | 6.1     | 7 1/2   | 7.5     | 10.0    | 8.7     |

**Note:** At a spout height of 6 1/2 in., an unrestrained cover will begin to lift.

H = Height of spout above manhole cover

Q = SSO Flowrate



## ATTACHMENT B

### **PURPOSE**

This SOP addresses procedures for response, investigation, abatement, reporting of, and follow-up investigation to SSOs from the public wastewater collection system to surface waters and/or stormwater system. These are unpermitted discharges.

### **OBJECTIVES**

- To promptly notify the appropriate regulatory agency with preliminary SSO information and potential impacts
- To notify the public
- To protect public health, environment, and property from SSOs
- To restore the surrounding area to pre-SSO condition as soon as possible
- To establish perimeters and control zones with appropriate traffic cones and barricades, vehicles, or use of natural topography (e.g., hills, berms, etc.)
- To contain the SSO to the maximum extent possible and prevent the discharge of sewage into surface waters
- To perform follow-up CCTV investigation to accurately identify the cause of the SSO as well as to identify necessary measures to ensure that the SSO does not occur again. The follow up CCTV must be performed according to NASSCO's Pipeline Assessment Certification Program (PACP®)
- To minimize potential liability, civil penalties and fines

### **RESPONSE TIME**

One hour<sup>5</sup>

### **ABATEMENT DURATION**

One day<sup>6</sup>

### **CLEAN-UP RESPONSE**

Two days post-abatement or wet-weather event

### **CCTV FOLLOW-UP INSPECTION**

Five days post-abatement or wet-weather event

---

<sup>5</sup> One hour from receiving the radio call from Control One. Response time may vary during wet-weather events.

<sup>6</sup> Applies to choked sanitary condition, not surcharged condition during wet-weather events.

## **DEFINITIONS**

### **SSO**

Any spill, release, or discharge from any portion of the sanitary sewage collection system into the environment, whether active or evidence thereof. A basement backup is an SSO if a discharge to the environment occurs during the pump out operation or in any other manner.

### **Active Overflow**

A spill, release, or discharge from a cleanout, manhole, or broken pipe that is flowing at the time of arrival of the first responder.

### **Evidence of Overflow**

A location where there is evidence of an overflow incident, but the SSO is not active when observed by the first responder.

### **Dry-Weather Overflow**

Any discharge from the Collection System that is unrelated to precipitation related flows (including storm water and snow melt runoff). It shall be presumed that flow in the Collection System more than 72 hours after a rain event or snow melt event is unrelated to rain or snow melt.<sup>7</sup>

### **First Responder**

Utility Investigator from the UMD, Pollution Control Analyst from OCAL, or designated Consultant, to be followed by Sewer Maintenance Supervisor (UMD) if an active SSO is confirmed.

### **Event Notification System (ENS)**

A flow meter installed in a manhole to alert the City of an SSO event.

## **SOP AT A GLANCE**

1. Fielding the Complaint Received via 311
2. Responding to an Event Notification alert
3. SSO Investigation
4. SSO Notifications and Reporting
5. Overflow Relief
6. Cleanup of SSO Site
7. Public Notification
8. SSO Follow-up CCTV Investigation

---

<sup>7</sup> Definition for the Baltimore City Consent Decree and associated reporting

## **PROCEDURE**

### **1. Fielding the Complaint Received via 311**

- 1.1. The SSO complaint (“Sewer Overflow”) is received either in the 311 Call Center, via the on-line 311 application, or via Spot 311 (mobile application).
- 1.2. The 311 Call Center creates a *WW Sewer Overflow* Service Request (SR) for the SSO complaint in the CSR system. The SR is automatically transferred to Cityworks, where the Dispatcher in Control One will view the SR.
- 1.3. The on-call DPW Utility Investigator is notified by the Dispatcher via radio.
- 1.4. Immediately following the radio call, the Dispatcher will email the SR to the responding Investigator. The SR may include customer comments, GPS coordinates of the overflow and citizen contact information.
- 1.5. The Utility Investigator should arrive at the complaint location within one hour of receiving the radio call, unless there are extenuating circumstances (e.g. severe weather event and/or high volume of customer complaints). The extenuating circumstances must be documented in the Cityworks comments before closing the service request.
- 1.6. **If the complaint location cannot be found** based on the complaint information, the Utility Investigator will notify Control One.
  - 1.6.1. Control One will then contact the citizen who made the complaint to determine a more exact location and whether the SSO is still occurring. The citizen may be invited to meet the Utility Investigator on-site. If the citizen has provided a phone number with voicemail capabilities, Control One should leave a voice message asking the citizen to call 311 with the SR number of their complaint and provide any available information to assist locating the SSO. If the citizen has provided an email address, Control One should email the citizen and request the citizen to contact 311 again with the SR number of their complaint. Control One will then update Cityworks with the following information:
    - Was the citizen contacted to confirm location and/or problem? (Yes/No).
  - 1.6.2. If the investigator is unable to find the complaint site and Control One is unable to reach the citizen, Control One will document the efforts that were made to contact the citizen in the SR. Control One will close the Service Request ensuring that their attempt to contact the citizen is documented.

## 2. Responding to an Event Notification Alert

- 2.1. At the onset of an SSO event at ENS locations<sup>8</sup>, the flow meter will send an email when the flow level reaches the manhole cover (“event has occurred”) and when the flow level recedes below the manhole cover (“return to normal”). The email is sent to:
- a. Control One
  - b. Head, BWW
  - c. Chief, UMD
  - d. Wastewater General Superintendent
  - e. Water General Superintendent
  - f. Stormwater General Superintendent
  - g. Traffic Control Unit Supervisor
  - h. OAM
- 2.2. Upon receiving the email notification from the flow meter indicating an “event has occurred”<sup>9</sup>, the Control One Dispatcher notifies the Sewer Maintenance Supervisor on duty and the Traffic Control Unit about the active SSO via radio.
- 2.2.1. The Dispatcher will create a *ML SSO Response Work Order* associated with/attached to the manhole where the alert originated and include the notification email received from the flow meter in the comments. The Dispatcher will **email the Work Order** to the Sewer Maintenance Supervisor.
- 2.2.2. The Traffic Control Unit must respond and visit the location within one hour of receiving the radio call from the Control One Dispatcher. The Traffic Control Unit will assess the site conditions and determine if lane or road closures are necessary. If lane or road closures are deemed necessary, the Traffic Control Unit will post and install the required signs and traffic barricades per approved Maintenance of Traffic (MOT) plans for each ENS site. The Traffic Control Supervisor will **take a photo** of the site to document the extent of the flooding and any traffic control implemented; multiple photos may be required. The Traffic Control Supervisor will **email the photos to OAM** as soon as possible.
- 2.2.3. If road closure becomes necessary, the Traffic Control Unit will contact the Dispatcher and request that a Road Closure Notification be issued. The Dispatcher will issue a **Road Closure Notification** to the **DL – Water Emergency** email distribution list.

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<sup>8</sup> Locations include some chronic, wet-weather overflow locations implemented at the sole discretion of the Director of DPW.

<sup>9</sup> The Control One Dispatcher will continue to receive emails from the flow meters as the levels fluctuate above and below the manhole cover; this is to be expected and should not trigger additional notifications.

- 2.2.4. In addition to posting and installing the necessary MOT signs and barricades to divert motor vehicles away from the overflow, the Traffic Control Unit must cordon off and modify pedestrian traffic patterns away from the overflow.
- 2.3. After calling MDE, the **Sewer Maintenance Supervisor** must email the 24-Hour Report using the Cityworks SSO Reporting Application to the associated distribution list (refer to Sections 4.1 and 4.2) within 24 hours. The 5-Day Report will be completed by OAM in accordance with Sections 4.8 and 4.9.
- 2.4. The flow meter will continue to send “event has occurred” and “return to normal” emails as long as the flow level fluctuates above and below the manhole cover. **The Wastewater General Superintendent will monitor these emails and determine when the SSO event has ended, and MOT signs can be removed.** Before making the decision to remove the MOT devices, the Wastewater General Superintendent will check the weather forecast to determine if the storm event has ended. If the weather forecast calls for additional storms, the MOT devices should remain in place. Per the discretion of the Wastewater General Superintendent, the MOT devices will be removed by the Traffic Control Unit.

### 3. SSO Investigation

- 3.1. **If the complaint location is found and the overflow incident is not active, but there is evidence of an overflow event**, the Utility Investigator must check the manholes up and downstream to see if flow is moving freely.
- 3.2. **If an active SSO is confirmed**, the First Responder<sup>10</sup> will remain onsite until the Sewer Maintenance Supervisor arrives.<sup>11</sup> The Sewer Maintenance Supervisor should arrive onsite within one hour of notification from the First Responder.
- 3.3. **Regardless of the state of the SSO (i.e., active or evidence only)**, the First Responder must:
  - 3.3.1. Create a new SSO record in the Cityworks SSO Reporting Application. The application must be used to record the time at which the First Responder confirmed the active SSO or arrived on site (in the case of evidence only), which will be used as the start time for the duration and volume calculations.<sup>12</sup> The First Responder may begin populating the SSO record with known information. If the Pollution

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<sup>10</sup> Pollution Control Analysts may identify an active SSO when performing field work associated with Pollution Source Tracking.

<sup>11</sup> If in the opinion of the Utility Investigator/Pollution Control Analyst the SSO is difficult to locate or, if the discharge is not visible at ground surface, then the first responder should remain on-site.

<sup>12</sup> If a time-stamped photograph of the confirmed SSO site is produced by others within three days of when the First Responder arrived on site indicating an earlier start time, that time may be used to calculate duration and volume of the spill if deemed appropriate by the Office of Asset Management.

Control Analyst finds an SSO during the course of pollution source tracking, this should be noted in the comments field on the 24-Hour Report. The remaining information will be populated by the Sewer Maintenance Supervisor, who is responsible for completing and submitting the 24-hour SSO report electronically within the Cityworks SSO Reporting application (refer to Section 4 below for reporting requirements).

- 3.3.2. Inform Control One of the SSO, stating whether it is active or evidence only. Control One will then notify the Sewer Maintenance Supervisor of the SSO<sup>13</sup>.
- 3.3.3. **Take a photograph of the area upon arrival.** Photographs should include vicinity photos to clarify the location of the overflow. The photos must be attached to the new SSO record within the Cityworks SSO Reporting Application. Photographs will be used to estimate the volume discharged from an “evidence only” event site. Post temporary SSO notification signs in accordance with Section 7 below.
- 3.4. The Sewer Maintenance Supervisor will call for crew assistance to abate the SSO. If the Sewer Maintenance Supervisor deems it necessary, a Pump Truck Crew for bypass pumping may be requested (Refer to Sections 5.7 and 5.9).
- 3.5. The Sewer Maintenance Supervisor will call Control One and direct them to create any necessary response Work Orders in Cityworks (e.g. mainline choke, cleaning, CCTV, or bypass pumping). A mainline CCTV work order must be created for every SSO that occurs due to a mainline choke.
- 3.6. Once the responding Sewer Maintenance Supervisor has investigated the SSO location and assessed the situation, he/she must inform the Wastewater General Superintendent of the situation by radio, phone, or email.
- 3.7. If contact information for the person lodging the complaint is available from Control One, the Sewer Maintenance Supervisor should contact the citizen to advise them of the situation and the action being taken. **Unless specifically requested by the citizen, this call should not be placed between the hours of 10:00 p.m. to 7:00 a.m.** If contact information is not available, a note will be made in the SR to that effect.
- 3.8. The Sewer Maintenance Supervisor will open the saved, incomplete SSO record in the Cityworks SSO Reporting Application and populate the remaining fields.

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<sup>13</sup>Between the hours of midnight and 8:00 am, when the Sewer Maintenance Supervisor is off-duty, the Dispatch Center should contact the Sewer General Superintendent so he can contact and send a Sewer Maintenance Supervisor to the site.

- 3.9. Before leaving the site, the Sewer Maintenance Supervisor must photograph the area and attach it to the SSO record using the application<sup>14</sup>. The purpose of this photograph(s) is to document the requirements set forth in this SOP (e.g. cordoning the site, placement of signs and/or clean-up) were followed; therefore multiple photos may be required.
- 3.10. After calling MDE, the Sewer Maintenance Supervisor must email the 24-Hour Report using the Cityworks SSO Reporting Application to the associated distribution list (refer to Sections 4.1 and 4.2) within 24 hours of the First Responder confirming the event<sup>15</sup>.

#### 4. SSO Notifications and Reporting

- 4.1. If an active SSO is confirmed, or the evidence suggests an unwitnessed overflow event **reached surface waters or a storm drain**, the Sewer Maintenance Supervisor<sup>16</sup> shall contact the following individuals **within 24 hours** of the Utility Investigator/Pollution Control Analyst confirming the event.

- |                                      |                         |
|--------------------------------------|-------------------------|
| a. MDE                               | telephone <sup>17</sup> |
| b. BCHD                              | via e-mail              |
| c. Chief, UMD                        | via e-mail              |
| d. Wastewater General Superintendent | via e-mail              |
| e. OAM                               | via e-mail              |
| f. OCR                               | via e-mail              |

- 4.2. At the time the SSO becomes **equal to or greater than 10,000 gallons**, the Wastewater General Superintendent<sup>12</sup> will contact the following individuals **immediately**:

- |   |           |
|---|-----------|
| a. MDE  | telephone |
| b. BCHD   | e-mail    |
| c. DPW  | e-mail    |
| d. W&WW Bureau Head                                 | e-mail    |
| e. Chief, UMD                                       | e-mail    |
| f. Chief, OCR                                       | e-mail    |
| g. Chief, OAM                                       | e-mail    |
| h. Chief, Communications & Community Affairs        | e-mail    |
| i. Public Information Supervisor(s)                 | e-mail    |
| j. Section Chief, Water Quality Monitoring and IDDE | e-mail    |

<sup>14</sup> If photographs cannot be attached immediately due to poor signal strength, then the Sewer Maintenance Supervisor should attach them as soon as adequate signal strength is attained.

<sup>15</sup> If the internet strength signal is insufficient, notes should be recorded on paper and transferred to the Cityworks SSO Reporting Application as soon as practical, but within 24 hours.

<sup>16</sup> The OEC will make this notification for overflow events at the structured overflow locations (e.g., #67 and #72).

<sup>17</sup> MDE must be contacted at 410-537-3510 (after hours: 1-866-633-4686) **within 24 hours**.

- 4.3. The Chief of DPW Communications and Community Affairs Division, in concurrence with BCHD, may make additional notifications and public notices if they deem necessary.
- 4.4. As soon as the Wastewater General Superintendent suspects the overflow will exceed 10,000 gallons, they should contact the Water Quality Monitoring and IDDE Section Chief and the Communications & Community Affairs Division Chief by email and/or phone<sup>18</sup>.
- 4.5. The Water Quality Monitoring and IDDE Section will obtain grab samples if the overflow is greater than 10,000 gallons or, if less than 10,000 gallons, as requested by the Bureau Head/Office Chief or BCHD. The Water Quality Monitoring and IDDE Section will obtain and submit the samples to the contracted testing lab (Maryland State Certified) in accordance with the protocol set forth in Section 6 - Water Quality Sampling and Monitoring - of the ERP.
- 4.5.1. All water quality test results and analyses conducted as part of a response to an overflow event will be maintained by the Water Quality Monitoring and IDDE Section as a matter of record keeping, and will be provided to EPA and/or MDE as requested.
- 4.6. As soon as practical, and regardless of the SSO volume, the Wastewater General Superintendent or Sewer Maintenance Supervisor will determine if there are sensitive population centers (such as school or day care centers) near the location of the SSO event. If there are sensitive population centers, the General Superintendent, the Supervisor or his/her designee will visit each facility to provide the proper authorities of each facility personal verbal notification of the situation. The following language is recommended to communicate the situation:
- “At approximately (time) this morning/afternoon a sanitary sewer overflow occurred... (provide a brief description of the SSO location such as: around the corner from this facility, in the 400 block of Any Street). The Baltimore City Department of Public Works is responding to the event, and is taking (or has taken) all necessary measures to mitigate and stop the overflow. At this point the overflow has (or has not) been stopped. We ask that you limit any activity that may place anyone associated with your facility at risk of coming in contact with the spill until all work is completed and the site is cleaned up. We will inform you when that happens.”
- 4.7. As soon as practical, the Wastewater General Superintendent or Sewer Maintenance Supervisor or his/her designee must inform the proper authorities at these nearby sensitive population centers when the work associated with the SSO is completed, so that the facility may return to normal operation.

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<sup>18</sup> Outside of normal working hours (8:30 am – 4:30 pm), the Communications & Community Affairs Chief must be contacted via cell phone: 443-571-0638. If unavailable, the PIO should be contacted via the City Hall Operator: 410-396-3100.

- 4.8. Within one business day after receiving the 24-Hour Report, the Chief of OAM, or his/her designated authorized staff, will review the report in the Cityworks SSO Reporting Application. The 24-Hour Report will be reviewed for accuracy and completeness; necessary corrections will be coordinated with the Wastewater General Superintendent and/or Investigator Supervisors. Field investigations will be performed randomly, or as necessary, within two days of receiving the 24-Hour Report to QA/QC the field response, including but not limited to posting of temporary signs and site clean-up. If a pipe repair or replacement was required to abate the SSO, OAM will monitor the progress of the repair. The version of the 24-Hour Report that has had QA/QC completed is termed the 5-Day Report, which will be emailed via the application to the Water and Wastewater Bureau Head.
- a. If the SSO occurred at an ENS, the automated, calculated volume will be entered at this time.
  - b. If the SSO is ongoing, the 5-Day Report will state this, and a follow up report with an associated letter of explanation will be submitted once the SSO is abated. MDE will be notified daily and the interactive map will be maintained/updated until the SSO is abated.
  - c. If a pipe repair/replacement was warranted, the SSO is not deemed abated until confirmatory testing performed by the Pollution Control Analysts indicate the SSO has been abated for SSO reported by Water Quality Monitoring and IDDE Section.
- 4.9. The Office of the Bureau Head will print and mail out (Courier) a signed 5-Day Report to MDE and EPA within five calendar days of the SSO confirmation. A copy of the signed report will be maintained per Consent Decree document management protocols.
- 4.10. OAM will prepare the quarterly SSO Update report to be submitted to EPA and MDE.

## 5. Overflow Relief

- 5.1. The Sewer Maintenance Supervisor must determine the immediate discharge location of the SSO (e.g., storm drain, contained ponding, street curb gutter, body of water, stream bed). If onsite, the Pollution Control Analyst or designated Consultant may assist in identifying the discharge location.
- 5.2. The Sewer Maintenance Supervisor must request necessary materials and equipment needed to contain or isolate the SSO<sup>19</sup> if not on hand. If it is impossible to contain or isolate the spill: cones, traffic barriers, yellow caution tape, and/or temporary SSO notification signs should be placed at potential access points to the spill site or receiving waters to protect public health.

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<sup>19</sup> The SSO must be contained to the maximum extent practicable, which is dependent on the rate of discharge.

- 5.2.1. Based on his/her professional opinion of the appropriate and necessary means, the Sewer Maintenance Supervisor must attempt to contain the SSO with sandbags, recover through vacuum truck, and/or divert to a downstream sewer manhole to prevent flows from reaching the Waters of the U.S. either by storm drain or by overland flow.
- 5.2.2. Where necessary to protect public health, the SSO location and the surrounding area must be cordoned off from the public, especially any areas where sewage has ponded or is running overland, with cones and/or yellow caution tape.
- 5.3. If the SSO is in a trafficked area, Maintenance must set up emergency traffic control. Assistance may be requested from DPW Traffic Control Unit. Signs should notify vehicles and pedestrians of flooded conditions and/or health risks as warranted.
- 5.4. The Sewer Maintenance Supervisor or designated field crew will investigate the mainline manholes upstream and downstream of the SSO location. After locating the first clear downstream manhole (not surcharging and free flowing), the field crews will begin to alleviate the blockage in the mainline.
- 5.5. If needed, the Sewer Maintenance Supervisor will request assistance or additional resources to relieve the blockage and/or determine the cause.
- 5.6. If necessary, to identify the cause of the blockage and alleviate the blockage, the Sewer Maintenance Supervisor will request CCTV of sewers and analyze the results of that inspection to determine further actions required (if any).
- 5.7. The Sewer Maintenance Supervisor determines whether bypass pumping is needed. If needed, they will request the Pump Truck Crew.
  - 5.7.1. Where bypass is necessary, the Sewer Maintenance Supervisor will determine the correct pump and pipe sizes required based on the volume of flow, sewer pipe size, and depth of manhole and will develop the bypass pumping plan. If necessary, they will request assistance from OEC - Utility Projects Delivery Section.
  - 5.7.2. The Pump Truck Crew will set up a bypass pumping arrangement, as directed by the Sewer Maintenance Supervisor, to help relieve the SSO.
  - 5.7.3. Should the SSO location require continued bypass pumping, the Sewer Maintenance Supervisor will notify the Wastewater General Superintendent.
- 5.8. The Sewer Maintenance Supervisor and crew will remain at the SSO site until the overflow is completely stopped<sup>20</sup>.

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<sup>20</sup> Applies to choked sanitary mainline condition, not surcharged condition during wet-weather events, failed pipe requiring a repair, or house connection chokes.

5.9. If the SSO condition is abated (i.e. overflow has stopped), but the cause cannot be resolved, the reason is documented by the Sewer Maintenance Supervisor in the response Work Order. When the SSO is stopped by relief of the choke, the Sewer Maintenance Supervisor will update and close the Cityworks response Work Order. **If bypass pumping was required to abate the SSO, the work order shall not be closed until the line is taken off of the bypass pumping.** If access to Cityworks is not available, the Supervisor will contact Control One to perform the update in Cityworks. The original Service Request will automatically be closed once all the response Work Orders have been closed.

## 6. Cleanup of SSO Site

6.1. The Wastewater General Superintendent is responsible for ensuring the SSO site is cleaned up within 48 hours (two days) after the SSO condition has been abated or wet-weather event has ended. No readily identified residue (e.g. sewage solids, paper, rags, plastics, and rubber products) shall remain.

6.2. To the maximum extent possible, thoroughly flush the area clean of any sewage or wash-down water. Solids and debris are to be flushed, swept, raked, picked-up and transported for proper disposal or to the nearest sewer manhole, depending on the nature of the material. **Flushing of wastewater or associated debris into the storm water system or adjacent waterways is strictly prohibited.**

6.3. Where appropriate (e.g. public-accessible permeable surfaces such as grass, gravel or sand), disinfect and deodorize the SSO site by liberally applying lime to the affected area.

6.4. Where sewage has resulted in ponding, pump the ponded area dry, and dispose of the residue in accordance with applicable regulations and policies.

6.5. Yellow caution tape placed to cordon off the spill site must be removed at the end of the clean-up phase.

## 7. Public Notification

7.1. In the event of a confirmed SSO, DPW initiates a coordinated effort to respond promptly and appropriately to the SSO. The City will provide public notice of all confirmed SSOs that reached or are likely to reach surface waters or storm drains. Once an SSO is confirmed, the City will issue public notices on the DPW website, within 24 hours of the SSO occurrence, utilizing an interactive map to identify the location of each SSO. DPW will also notify BCHD so that they may provide notice of confirmed SSOs via a social media or other website where BCHD regularly posts information. Public notices will provide pertinent information regarding each SSO, when it becomes available, including the date and time at which the SSO began, the estimated volume of the discharge, and the name of the receiving water if applicable. Notices will include an advisory regarding the adverse impact on water quality. Notifications may also be shared on the DPW website, Twitter feed, and disseminated via other social media tools. The City's procedures for notifying EPA, MDE, and BCHD are detailed in Section 4.4.1. The

presence (or absence) of adverse impact from an SSO does not determine whether surface water is safe for recreation. MDE has listed all surface waters in Baltimore City as impaired for bacteria. As such, receiving water quality may not meet applicable parameters for full-body contact recreation, independent of the impact of a specific SSO event. The City discourages full-body contact with surface water, and there are no designated locations in Baltimore City for full-body contact recreation in surface water

- 7.2. Temporary SSO notification signs (Figure 1) must be posted if any of the criteria below are met, regardless of the baseline water quality of the affected surface water. The notification signs must be as visible as possible.
  - a. The overflowing structure is inside or within 100 ft. of a public recreation area (i.e. park, ball field, playground, dog park, school yard, trail)
  - b. The overflowing structure is within 50 ft. of a waterway, stream or wetland
  - c. The overflowing structure or debris from the overflow is within 50 ft. of a building and direct contact is likely
  - d. If SSO reached a waterway by direct means or through a storm drain a sign is placed along the impacted area of the waterway if accessible to people
- 7.3. The Sewer Maintenance Supervisor is responsible for ensuring that temporary signs are posted by the First Responders at all pedestrian-accessible access points to the contaminated area within 500 ft. of the spill site.
- 7.4. If the SSO is greater than or equal to 10,000 gallons, the signs will be removed by the Sewer Maintenance Supervisor, or his designee, when the Pollution Control Analysts have determined through sampling that the SSO-contaminated waters have returned to ambient conditions. If the SSO has not affected a body of water, water sampling is not feasible, and no evidence of the SSO remains on site, the signs will be removed after 30 days, or per the direction of the Sewer Maintenance Supervisor.
- 7.5. If the SSO is less than 10,000 gallons, the signs will be removed by the Sewer Maintenance Supervisor, or his designee, after being posted for 14 days or the direction of the Sewer Maintenance Supervisor, assuming there is no evidence remaining.
- 7.6. Press Releases will be issued to alert the public of ongoing events, following large, dry-weather overflows, or as otherwise determined by the Chief of DPW Communications and Community Affairs Division, in concurrence with the BCHD. See <https://health.baltimorecity.gov/sanitary-sewer-overflows-ss0> and <https://health.baltimorecity.gov/newsroom/press-releases>



*Figure B-1: Temporary SSO Notification Sign*

## 8. SSO Follow-up CCTV Investigation

- 8.1. A follow-up CCTV inspection will be performed within five days of the SSO being abated, following the procedures described in the Mainline CCTV SOP or Lateral CCTV SOP.
- 8.2. The results of the CCTV inspection will be analyzed by OAM. Depending on the SSO location and analysis findings and conclusions, the Planning and Analysis Section of OAM will make recommendations for additional cleaning, root cutting, grease control, or repeat inspections. OAM will determine if repairs are needed and will coordinate repairs with either on-call contractors and OEC or with UMD.
- 8.3. OAM will continually monitor Cityworks for reoccurring SSOs and multiple SSOs occurring within close proximity. SSOs not caused by known capacity deficiencies are flagged for additional CCTV investigation. If warranted, repairs will be coordinated with either on-call contractors and OEC or with UMD

## ACRONYMS AND ABBREVIATIONS

|              |  |
|--------------|--|
| ARV          | Air Release Valve  |
| AS           | Ammonia Screening  |
| ATS          | Automatic Transfer Switch                                    |
| BCHD         | Baltimore City Health Department                             |
| BGE          | Baltimore Gas & Electric                                     |
| BOD          | Biochemical Oxygen Demand                                    |
| BWW          | Bureau of Water and Wastewater                               |
| CCTV         | Closed-Circuit Television                                    |
| The City     | Baltimore City or City of Baltimore                          |
| CMMS         | Cityworks Computerized Maintenance Management System         |
| Control One  | DPW's Control One Office                                     |
| CRBB         | Capacity-Related Building Backup                             |
| DPW          | Department of Public Works                                   |
| ENS          | Emergency Notification System                                |
| EPA          | U.S. Environmental Protection Agency                         |
| ERP          | Revised Emergency Response Plan                              |
| FOG          | Fats, Oils, and Grease                                       |
| Ft.          | Feet   |
| GPD          | Gallons per Day  |
| GPM          | Gallons per Minute   |
| Homeowners   | City Homeowners, Renters, and Other Non-Commercial Occupants |
| ID           | Identification   |
| IDDE         | Illicit Discharge Detection and Elimination                  |
| In.          | Inches   |
| Investigator | UMD Investigator   |
| IT           | Information Technology                                       |
| MCC          | Motor Control Center   |
| MCD          | Modified Consent Decree                                      |

|               |   |
|---------------|---|
| MCU           | Mini-Camera Unit                                      |
| MDE           | Maryland Department of the Environment                |
| MGD           | Million Gallons per Day                               |
| MPN           | Most Probable Number                                  |
| NPDES         | National Pollutant Discharge Elimination System       |
| OAM           | Office of Asset Management                            |
| OCAL          | Office of Compliance and Laboratories                 |
| OCR           | Office of Compliance and Research                     |
| OCSA          | Office of Communications and Strategic Alliances      |
| OEC           | Office of Engineering and Construction                |
| O&M           | Operation and Maintenance                             |
| PACP          | Pipeline Assessment Certification Program             |
| pH            | Potential Hydrogen                                    |
| Pilot Program | Pilot Building Backup Expedited Reimbursement Program |
| PLC           | Power-line Communication                              |
| QA/QC         | Quality Assurance/Quality Control                     |
| QR            | Quarterly Report                                      |
| SCADA         | Supervisory Control and Data Acquisition              |
| SDUO          | Sanitary Discharge of Unknown Origin                  |
| SIS           | Stream Impact Sampling                                |
| SM            | Standard Method                                       |
| SOP           | Standard Operating Procedure                          |
| SOS           | Sewage Onsite Support                                 |
| SR            | Service Request                                       |
| SSO           | Sanitary Sewer Overflow                               |
| TSS           | Total Suspended Solids                                |
| UMD           | Utility Maintenance Division                          |
| VFD           | Variable Frequency Drive                              |
| WQMI          | Water Quality Monitoring and Investigation            |

## GLOSSARY

|                           |  |
|---------------------------|--|
| <b>Building Backup:</b>   | A wastewater or sewage release or backup into a building that is caused by blockages, flow conditions, or other malfunctions in the Collection System. A sewage backup or release is not a Building Backup if: (1) it is caused by blockages, flow conditions, or other malfunctions of a Private Lateral or other piping/conveyance system that is not owned or operationally controlled by Baltimore; or (2) is the result of overland, surface flooding not emanating from the Collection System. |
| <b>Collection System:</b> | Any collection and transmission system (including all pipes, force mains, sanitary sewer lines, combined sewer lines, if any, overflow structures, regulators, lift stations, pumping stations, manholes, and appurtenances thereto) owned by Baltimore City and designed to convey sewage to any treatment plant(s) or in wet weather to an overflow structure.   |
| <b>Day or Days:</b>       | Refers to calendar days. Pursuant to the Consent Decree, when a report or other deliverable is due on a Saturday, Sunday or any federal, state, or city holiday, the City has until the next calendar day that is not a holiday or weekend to submit the report or deliverable, with the exception of Sanitary Sewer Overflow reports required by Paragraph 17 of the Modified Consent Decree.   |
| <b>DPW:</b>               | Baltimore City Department of Public Works  |
| <b>First Responder:</b>   | DPW Utility Investigator, Pollution Control Analyst, or the City's authorized designee   |
| <b>MCD:</b>               | Modified Consent Decree entered by the United States District Court in Civil Action No. JFM-02-1524  |
| <b>Pumping Station:</b>   | Facilities composed of pumps that lift wastewater to a higher hydraulic elevation, including all related electrical, mechanical, and structural systems necessary to the operation of that pumping station. For the purposes of the MCD, the term <i>pumping station</i> refers to the following facilities:   |

- (i) Eastern Avenue
- (ii) Brooklyn
- (iii) Dundalk
- (iv) Jones Falls
- (v) Locust Point
- (vi) Quad Avenue
- (vii) McComas Street
- (viii) Westport
- (ix) Stony Run

**ERP:** Revised Emergency Response Plan prepared pursuant to Paragraph 16 of the MCD.

**SDUO:** Any discharge of sewage through the City's separate storm sewer system, where the source of the sewage is unknown. Once the source of the SDUO is confirmed, if it originates from the Collection System, it is a Sanitary Sewer Overflow.

**SSO:** Any spill, release, or discharge of wastewater from any portion of the Collection System, except from NPDES permitted outfalls in accordance with the applicable permit.

**SSO Structure:** Any structure constructed to allow discharge from the Separate Sanitary Sewer System at a point prior to the headworks of either the Patapsco or Back River wastewater treatment plants.