Appendix B

Sanitary Sewer Overflow Response Plan

City of Memphis

Sewer Overflow Response Plan

March 2011

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Appendices

Executive Summary

This Sewer Overflow Response Plan (SORP) outlines the actions the City of Memphis (City) shall take to reduce the impact of sanitary sewer overflows (SSOs) on human health, customers, and the environment. The City's Public Works staff has developed this living document to assist with defining their standard operating procedures for SSO responses and training of their staff on the appropriate field and reporting practices. The key aspects of the SORP are defined specifically within the document and include the following key features.

Staff Communications and Duties

To ensure the City is made aware of each SSO as expeditiously as possible, there are several methods by which SSOs are reported. The most common and effective notification comes from individuals who witness an event and call the City's Environmental Maintenance Dispatch at (901) 529-8025. Dispatchers take reports ranging from manhole overflows to sewage on private property and input the call into the management system for crew response. In addition, other City employees/field crews, city employees, police and/or fire, or other agencies also commonly report SSOs to the Environmental Maintenance Dispatch. The City is also investing in automated systems such as a supervisory control and data acquisition system (SCADA) at lift stations to assist with alerting lift station crews that an investigation is warranted. The processes by which SSOs are reported and the actions generated from a report of an overflow, as well as the responsibilities of the employees charged with responding to the SSOs, are detailed in Section 4.

Prompt Response and Assessment of Cause and Impact of SSOs

The City has a goal to respond onsite to verify an SSO has occurred, on average, within 1-2 hours of receiving a SSO report, unless circumstances prevent a response in that time frame. The City expects that in no case more than 12 hours should be required to respond. This response time can vary widely and can be affected by holidays, weather conditions, after-hours calls, locations, and other factors that can cause this timeframe to fluctuate within the 12 hours range. The time to stop a SSO is discussed in Section 1.1. Once a response is initiated, the initial key first step is the identification of the cause of the SSO. The various causes shall determine the type of mitigation or remediation that is most appropriate. Dry-weather overflows result primarily from blockages caused by grease build up or roots, while wet-weather overflows can typically be caused by inflow and infiltration (I/I). SSOs occurring during rain events are not considered wet-weather events if they are considered to have occurred due to a dry weather blockage. Historically, the City has discovered that most overflows during wet weather events are typically caused by blockages that have occurred during dry weather events and are generally the result of existing dry-weather blockages within the system, as opposed to capacity concerns. When

evaluating the potential impact of an SSO on public health and the environment, sensitive factors shall be identified. These factors shall determine the level of public notification and cleanup activity required. These sensitive factors primarily include the proximity of the SSO to:

- Streams, creeks, and other natural waterways;
- Heavy pedestrian areas; and
- Special facilities including schools, public parks, walking trails, and other areas with high potential for human contact.

The process by which the City assesses whether an SSO has had any adverse impacts on human health or the environment is described in Section 4.

If a backup has occurred on private property, the City shall respond in accordance with the SORP. The response staff shall conduct an investigation to determine if the cause is problems in the City's collection system or a result of a failure on the customer's side. The process a property owner follows to dispute the determination that a building backup is caused by a failure in their private lateral and/or make additional damage claims is outlined in Section 4.

Elimination of Cause and Mitigation of Impact of SSO

Once the cause of an SSO has been identified, the proper type of remediation can be chosen. This document summarizes common abatement resolution activities and repairs that can be used independently or in combination based on field conditions and television inspection. The resources, including personnel and equipment needed and available to perform these activities and repairs, are identified herein and included in the Appendix. When possible, flow diversion techniques provide an effective means of conveying the discharge back into the sewer system. This procedure reduces additional potential impacts on the immediate area and possible impacts downstream. Control zones shall be established for SSOs requiring control of the area surrounding the overflow to help prevent public access around the perimeter of the affected surface area. The City staff shall utilize appropriate signs and barricading practices to control access to these areas.

Cleanup of SSOs

After an overflow has occurred, Memphis will clean the impacted area. General practices, depending on the individual situation, are outlined in Section 4. To minimize any further impact on human health or the environment, follow-up inspections and root cause analyses shall be performed to identify the specific cause of the overflow. Methods for determining the causes of SSOs may include television inspection, dyed water flooding, visual inspection, and follow-up site visits. If a building backup is found to be caused by a collection system failure or blockage, the

Environmental Maintenance staff shall dispatch an independent cleaning contractor to assist in cleaning.

Reporting to the Regulatory Agency

Consistent with the City's NPDES permit, the City shall provide an initial notice to TDEC of an SSO within 24 hours of the time it becomes aware of an SSO that could cause a threat to a public drinking water supply or is a threat to human health or the environment. The complete reporting process that includes the oral and short-term reporting by which the City notifies TDEC is summarized in Sections 4 and 5. The City shall notify the public of SSOs on a case-by-case basis, based on severity and location of the overflow. Deliverable reports of SSOs required by the Consent Decree shall be included in the Public Repository and made available online.

Section 1
Introduction and Process Overview

1.1 General

The City believes that it provides an efficiently designed, maintained, and operated sanitary sewer system to safely collect and convey sewage to one of the two wastewater treatment plants for treatment and discharge.

An SSO occurs when sewage escapes from the sanitary sewer system at a location other than an approved discharge point. An SSO can result from flow restrictions or system disruptions, or it may result from excessive flows caused by elevated ground and surface water during significant rain events.

The City developed this SORP to reduce the impact of SSOs to human health and the environment. The document provides structured guidance for response to overflows, including a range of appropriate and effective field activities staff can choose from to meet the needs of each SSO situation.

The purpose of the SORP is to document the protocol to be followed in response to identified SSOs within the City's service area, while providing sufficient flexibility to address case-specific issues as appropriate. This protocol includes an initial mobilization response once an overflow notification is received; stoppage of the SSO within a reasonable time period; mitigating impacts from the overflow once cleared; and any other required follow up to further reduce the opportunity for any future occurrence. As a goal, the City generally shall take all measures to stop the SSO within 12 hours, on average, after verification of the SSO, depending on the circumstances or the nature or cause of the SSO. Additional time may be required in other situations to stop the SSO depending on access limitations (railroad access for example). In addition, monitoring and reporting procedures are included to comply with state and federal regulatory requirements. Finally, an assessment approach is included to take steps to prevent future SSO recurrence.

1.2 Objectives

The primary objective of the SORP is the protection of human health and the environment due to potential concerns associated with SSOs.

1.3 Process Overview

This SORP provides structured guidance for response to SSOs, including a range of appropriate and effective field activities that the City can choose from to meet the needs of each situation. The City shall use its discretion and best professional judgment to evaluate each event and choose the appropriate remediation tools.

Memphis is a steward of the environment, and the first priority at any overflow is containing the discharge to minimize possible harmful impacts to the environment

and public health. Early identification of an SSO is extremely important to reduce the quantity of raw sewage discharged, as well as limit the impact on the environment and the general public. The investigation process begins when a customer, City employee, or outside party reports a possible SSO. The City expects that visual indications of SSOs at 81 pump stations will be available through the City's SCADA system beginning in March of 2012.

This SORP contains the following procedures used for responding to SSOs that can minimize the environmental impacts and potential human health risk of the SSOs:

1. Procedures for immediate public notice of the SSO, as necessary.
2. Procedures for providing timely notification to the Tennessee Department of Environment and Conservation (TDEC) and local public health officials of SSOs, as warranted.
3. Procedures for minimizing the volume of untreated wastewater transmitted in the event of an SSO.
4. Procedures for providing relief to customers experiencing building/private property backups resulting from problems in the collection system.
5. Procedures for providing customers with the City's claims policy regarding clean up of building/private property backups.
6. A review of the available equipment necessary to respond to an SSO and implement the SORP.
7. Procedures for ensuring the preparedness, including responsiveness training, of necessary City employees and contractors for effective implementation of the SORP.
8. Identification of potential SSO locations within each lift station service area, prioritized by order of SSO in the event of a lift station failure.
9. Identification of available storage capacity at lift stations to minimize the volume of untreated wastewater entering the watershed, if a lift station failure should occur. This existing storage capacity allows for a response protocol based on available capacity and normal pumping capacity.

1.4 Need for Immediate Response

Upon notification of an SSO event, the initial response of the City shall be undertaken to protect the general public and limit the impact on the environment. An initial response would also help in gathering information and correcting each overflow.

The key elements in the initial response are:

- Inspection and quantification of the SSO;
- Determination of the cause of the SSO;
- Initial attempt to correct the problem;
- Containment of the overflow, if not corrected immediately;
- Placement of barricades and/or warning signs, as necessary; and
- Public communication, as required.

After the initial response, the stoppage operators (first responders) shall report all available required information such that long-term solutions, proper reporting to the regulatory agencies, and timely notifications to all affected parties can be conducted. Further discussion of the initial response procedures are described in Section 4.

1.5 Critical Actions to Minimize the Impact of an SSO

The critical actions required to eliminate, reduce, and minimize the impact of an SSO are:

- Notification and Reporting – Identify and report all SSOs to the Repair and Stoppage Bureau, so a crew can be dispatched to determine the cause.
- Identification of cause – Determine the cause of the SSO and who needs to be notified.
- Initial/Short-term Response – Determine what procedures need to be completed to correct the problem and minimize the impact to the environment.
- Long-term Response – Take measures to eliminate or try to prevent the SSO from occurring in the future.
- Notification – Report SSOs to the appropriate regulatory agencies.

1.6 Organization of SORP

This SORP is organized into the following sections:

- **Section 1 – Introduction and Process Overview:** Provides background information, description of the problem, and general goals and guidelines of the report.
- **Section 2 – Definitions:** Provides definitions of commonly used terminology referenced in the document, including common terms and acronyms.

- **Section 3 – System and Organizational Structure:** Provides details of the organizational structure of the City's Repair and Stoppage Bureau and the responsibilities of the staff that relate to responses to SSOs, resolution of SSOs, and reporting SSOs.

- **Section 4 – Initial Response:** Provides a detailed list of actions and personnel responsible for responding to SSO events.

- **Section 5 – Short-term Response:** Provides a list of actions and personnel responsible for reporting and reducing SSOs within 5 days of report. The list of actions includes follow-up reporting requirements, as well as necessary investigations to try to prevent future SSOs.

- **Section 6 – Long-term Response:** Provides a list of actions and personnel responsible for reporting SSOs to the regulatory agencies, investigations needed to prevent future SSOs, and possible long-term cost-effective solutions.

- **Section 7 – SORP Training Procedures:** Outlines training for responding to an SSO. The training procedures used include potential scenarios encountered during an SSO and exercises and drills to prepare staff for an emergency.

Section 2
Definitions

2.1 Definitions

This section is designed to help familiarize readers with common terms and acronyms used in this report. It includes basic definitions of a wastewater collection system and sanitary sewer overflows, for example, to assist readers with understanding the following sections.

2.2 General Definitions

Building Backup –A wastewater release or backup into a building or private property that is caused by blockages, flow conditions, or other malfunctions in the wastewater collection and transmission system. A wastewater backup or release that is caused by blockages, flow conditions, or other malfunctions of a private lateral is neither considered nor reported as a building backup.

Closed-circuit Television (CCTV) - Technology by which the City and its outside contractors use closed-circuit television to visually inspect the internal condition of pipes and sub-surface structures.

Cleanout – A vertical pipe with a removable cap extending from a private service lateral to the surface of the ground. It is used for access to the private service lateral for inspection and maintenance.

Disruption of Service – An interruption in customers' wastewater collection service due to various reasons, such as blockages, pipe failures, etc.

Dry-weather Sanitary Sewer Overflow (SSO) – A type of sanitary sewer overflow that is defined as one day or any portion of a day in which unpermitted discharge of wastewater from the collection or treatment system other than through the permitted outfall occurs and is not directly related to a rainfall event. Discharges from more than one point within a 24-hour period shall be counted as separate overflows.

Environmental Protection Agency (EPA) – United States Environmental Protection Agency and any of its successor departments or agencies.

Fats, Oils and Grease (FOG) Program: "FOG" refers to fats, oils and grease, which are generated by residents and businesses processing or serving food and other products. A FOG program aims to prevent FOG accumulation in sewer systems by utilizing organized programs with proven effectiveness.

First Responder: Typically a designated Stoppage Operator, or any qualified Memphis employee, who assumes initial responsibility for an SSO event.

Force Mains: Any pipe that receives and conveys, under pressure, wastewater from the discharge side of a pump. A forcemain is intended to transmit wastewater under pressure.

Gravity Sewer Line or Gravity Sewer: Pipes that receive, contain, and convey wastewater not normally under pressure but are intended to flow unassisted under the influence of gravity.

Inflow and Infiltration (I/I): The total quantity of water from inflow, infiltration, and rainfall-induced infiltration without distinguishing the source.

Infiltration: Water other than wastewater that enters the wastewater collection and transmission system (WCTS), including sewer service connections and foundation drains, from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include inflow.

Inflow: Water, other than wastewater, that enters the WCTS (including sewer service connections) from sources such as, but not limited to, roof leaders, cellar drains, yard drains, area drains, drains from springs and swampy areas, manhole covers, cross connections between storm sewers and sanitary sewers, catch basins, cooling towers, stormwater, surface runoff, street wash waters, or drainage. Inflow does not include infiltration.

Lift Station: A mechanical method of conveying wastewater to higher elevations within the collection system and eventually to the wastewater treatment plant (WWTP).

Manhole or Junction Box: A structure which provides a connection point for gravity lines, private service laterals, or force mains, as well as an access point for maintenance and repair activities.

Memphis: The City of Memphis, Tennessee, Public Works Division, and any successor thereto.

Private Lateral: The portion of the sanitary sewer conveyance pipe that extends from the wastewater main to the single-family, multi-family, apartment, or other dwelling unit or commercial or industrial structure to which wastewater service is provided.

Sanitary Sewer Overflow (SSO): An overflow, spill, or release of wastewater from the WCTS, including: (a) unpermitted discharges; (b) overflows, spills, or releases of wastewater that may not have reached waters of the United States or the State; and (c)

all building backups. For the purposes of this document and the Consent Decree, an SSO does not include exfiltration from the WCTS.

Sanitary Sewer Overflow Response Plan (SORP): The SORP provides structured guidance, including a range of field activities to choose from, for a generalized uniform response to overflows.

Supervisory Control and Data Acquisition System (SCADA): A system of automated sensory control equipment that monitors the operation of a portion of the lift stations within the collection system. The SCADA system will convey alarms when predetermined conditions occur. Monitoring parameters include but are not limited to power failures, high wetwell levels, and pump failures that could potentially cause overflows.

Suspicious Substance: Any material not normally found in a wastewater system.

TDEC: Tennessee Department of Environment and Conservation.

Unpermitted Discharge: A discharge of pollutants which reaches waters of the United States or the State from (a) the sewer system, (b) WWTPs through a point source not specified in a National Pollutant Discharge Elimination System (NPDES) Permit, or (c) WWTPs which constitutes a prohibited bypass.

Wastewater Collection and Transmission System (WCTS): The municipal wastewater collection, retention, and transmission system including all pipes, forcemains, gravity sewer lines, pump stations, pumps, manholes, and appurtenances thereto, which are owned or operated by the City of Memphis and service the City of Memphis and which flow to the M.C. Stiles and T.E. Maxson WWTPs.

Wastewater Treatment Plant (WWTP): Devices or systems used in the storage, treatment, recycling, and reclamation of municipal wastewater. For purposes of this SORP and the Consent Decree, this definition shall refer only to the following treatment facilities: M.C. Stiles WWTP located at 2303 N. 2nd St., Memphis, Tennessee, and the T.E. Maxson WWTP located at 2685 Plant Road, Memphis, Tennessee, and all components of such sewage treatment plants but does not include the WCTS.

Waters of the State: Waters of the State shall have the same meaning as "Waters" defined at TCA § 69-3-103.

Wet-weather SSO: A type of sanitary sewer overflow and is defined as an unpermitted discharge of wastewater from the collection or treatment system other than through the permitted outfall that is directly related to a specific rainfall event. Discharges occurring from multiple locations within a single rainfall event are considered separate, wet-weather overflows.

2.3 Types of Overflows

Sanitary sewer overflow is an encompassing term to describe the discharge of wastewater from a wastewater collection system anywhere, except at a permitted discharge point. This SORP is developed to address the two fundamental types of SSOs:

2.3.1 Wet-weather Overflows

Wet-weather overflows are the result of excessive flows during significant rain events or elevated ground and surface water conditions. They can be attributed to a number of factors, including, but not limited to, the following:

- Infiltration and Inflow
- Flooding from the stormwater system
- Cross-connections (i.e. stormdrains, downspouts, and other illicit connections to the separate sanitary sewer system)

2.3.2 Dry-weather Overflows

Overflows during dry weather are most often caused by flow restrictions or system disruptions. Dry-weather SSOs can be attributed to a number of factors including, but not limited to, the following:

- Bottlenecks and/or blockages
- Grease
- Roots
- Debris
- Mechanical failures
- Sewer line/pipe breaks

The SORP discusses the type, location, destination, cause, impact, and containment and remediation requirements of SSOs, as well as prevention measures.

Section 3
System and Organizational Structure

3.0 Organizational Structure

Implementing an effective SORP requires coordination from several departments within the Public Works Division and other agencies and divisions within the City. The program is managed and housed within the Wastewater Collection Systems Department. The following core practices are necessary to ensure the plan is implemented effectively:

- Effective and timely communication.
- Trained and experienced Stoppage Operators and crew.
- Structured and concise response procedures, also known as standard operating procedures (SOPs).
- Accurate and comprehensive monitoring procedures.
- Regularly scheduled training of the staff on SORP protocol and safety practices.

This section outlines the organization and the distribution of responsibilities within the City's Public Works Division and Wastewater Collection Systems Department.

3.1 Memphis Wastewater Collection System

The City of Memphis' WCTS and treatment system serves a total area of 442 square miles, of which 314 square miles are within the City limits and 128 square miles are within suburban areas surrounding the City. The system is comprised of six major sewer basins—Loosahatchie, Wolf River, Front Street, President's Island, Nonconnah Creek, and Horn Lake Creek—each of which contains a WCTS comprised of main line sewers, trunk sewers and lift stations. The basins are served by two WWTPs: T.E. Maxson WWTP, which serves the Nonconnah Creek, Horn Lake Creek, and President's Island basins, and M.C. Stiles WWTP, which serves the Wolf River, Front Street, and Loosahatchie River basins.

The existing system serves more than 261,000 customers including over 200 significant and non-significant industrial users. The total system is comprised of the following infrastructure and assets:

- 2,400 miles of gravity sewers
- 39 miles of force mains
- 85,000 manholes

- 103 lift stations
- 2 wastewater treatment plants

3.2 Operational and Functional Structure

The City's Division of Public Works is a multifaceted organization with an organizational structure in place to provide operations and maintenance of the WCTS and treatment systems, as well as the streets, stormwater management and drainage, flood control, and solid waste systems of the City. An organizational chart of the Wastewater Collection Systems Department and the job descriptions for all key staff members is included in **Appendix A.**

The Wastewater Collection Systems Department, which is responsible for compliance with the regulatory requirements of the City's NPDES permits and the reduction of the impact of sanitary sewer overflows (SSOs) on the City's customers and surrounding environment, is directed on a day-to-day basis by the Administrator of Wastewater Collection Systems. The Administrator reports directly to the Administrator of Environmental Engineering, who oversees all services associated with the WCTS. The Administrator of Environmental Engineering reports directly to the Public Works Director, who oversees all activities within the Public Works Division for the City.

The Wastewater Collection Department includes professionals with backgrounds in engineering, wastewater operations and maintenance, administration, and communications. These individuals coordinate and communicate work and programs with other departments and divisions of the City government, including engineering, construction administration, wastewater treatment, and others to achieve the goals of the WCTS.

The operation of the collection system is a joint effort among the Inspection, Stoppage, and Repair Bureaus of the Wastewater Collection Systems Department. The Inspection Bureau evaluates the WCTS in an effort to prevent problems. These evaluations include manhole and mainline inspections, CCTV inspections, and dye and smoke testing. The Stoppage Crews are responsible for eliminating line stoppages and responding to and clearing SSOs and remediating their effects on the public and environment. The Repair Crews respond to calls to repair line and manhole issues reported by the Inspection and Stoppage Crews.

All of these activities fall under the direction of the Wastewater Collection Systems Department and, specifically, the Environmental Maintenance Bureau (EMB), which is responsible for alleviating stoppages reported by the public and for preventative maintenance of the WCTS. In addition, the EMB is responsible for repairing deficiencies reported by the inspection and stoppage crews. The Environmental

Maintenance Manager is the head of the EMB and is responsible for operations and maintenance of the WCTS. The EMB Manager reports directly to the Administrator of Wastewater Collection Systems and is responsible for coordinating the activities of staff engaged in repair and maintenance of the City's WCTS and coordinating and preparing reports for TDEC and EPA compliance. Currently there are seven shift supervisors, who report to the Environmental Maintenance Manager, are responsible for the day-to-day WCTS maintenance program. The shift supervisors oversee personnel providing training, work direction, and daily assignments of work orders, including dispatch of stoppage crews to correct sewer overflows. Currently there are 111 full-time equivalent (FTE) positions in the City's organizational structure for the Inspection/Stoppage and Repair Divisions of the Wastewater Collection Systems Department that maintain the WCTS, respond to SSOs, and perform other maintenance/construction activities.

The Lift Station Bureau currently operates and maintains the 103 wastewater lift stations located throughout the WCTS, including regular monitoring and maintenance of the pumping facilities. The Lift Station Manager, who reports to the Administrator of Wastewater Collection Systems, is responsible for operations and maintenance of the lift stations in the WCTS. Stationary engineers and maintenance workers/helpers report to the Lift Station Manager and are responsible for overseeing routine inspections and maintenance and repairs at the lift stations. SCADA monitoring shall be installed at 81 lift stations and shall be operational at all of the lift stations by March 2012. Once operational, information shall be transmitted to the lift station operators in the event of a system or lift station failure. In addition to continuous monitoring by SCADA, each station is inspected on a regular basis by the three lift station crews. The frequency of these inspections is based on several factors including the age of the facility, operating history, and size of the facility.

The key personnel responsible for implementing the SORP and the day-to-day activities of the Wastewater Collection Systems Department are described below.

The dispatcher and/or assigned data entry personnel are responsible for logging sewer overflow calls and reports into the information management system (IMS). Once the reported SSO is logged into the IMS, a work order is generated which results in appropriate staff being dispatched to the location of the SSO. In addition to the dispatchers, the schedule/planner and construction coordinator staff works under the manager and are responsible for scheduling work crews to handle sewer repairs and wastewater stoppages. The schedule/planner works hand-in-hand with the Dispatcher to reassign crews to handle SSOs and emergency repairs.

Once the call is logged into the IMS, the shift supervisors dispatch a stoppage operator, assisted by one or multiple crew persons, to the site of the complaint to remedy the cause of the SSO. They are responsible for assessing the SSO and collecting the information needed for the appropriate SSO response. From the initial

assessment, the effort needed to stop the SSO is determined. All findings are reported back to the shift supervisor. The stoppage operators work to maintain the WCTS lines in operation through clearing and removing stoppages, obstructions or restrictions through the operation of cleaning equipment including, but not limited to, a flusher, vactor, power rodder, and/or drag machine to clear the stoppage. Once the stoppage has been cleared, the crew shall clean and disinfect areas that were impacted by the stoppages as appropriate. The stoppage operator reports the location of the problem, cause of the overflow, the action taken, and current job status to the dispatcher and supervisor for documentation.

An environmental engineer receives the IMS work order and the stoppage operator's report on SSOs and maintains the database records on each SSO. The engineer is involved with the short- and long-term planning meetings based on SSOs that occur weekly and gives feedback to the administration as to SSOs that occurred within areas of recurring overflow issues. This information is used to prioritize preventative maintenance including, but not limited to, CCTV, additional cleaning and repair, and replacement or rehabilitation of existing infrastructure. The engineer is responsible for estimating the volume of each SSO from the information recorded on the SSO field notes and maintaining all pertinent information on all SSOs for internal record keeping and applicable reports to both TDEC and EPA.

The Administrator of Wastewater Collection Systems or his representative is responsible for reviewing and submitting a letter to TDEC, where required, within 5 days of the SSO occurrence and determining if potential health rises warrant notification to the general public. The administrator leads all discussions of the applicable short- and long-term responses to be taken based on the SSO occurrence.

3.3 Customer Calls and Dispatching

The Wastewater Collections Systems dispatcher receives and initiates responses to customer calls and concerns ranging from SSOs to wastewater on private property. The center is currently staffed 16 hours a day, 7 days a week. Afterhours calls to the Wastewater Collections System Department dispatcher automatically rollover to the City's WWTP (operated 24 hours per day, 7 days per week). In addition, citizens may also call the Emergency Management Services (EMS) operator (operated 24 hours per day, 7 days per week). These afterhours' calls from both the EMS and the WWTP are then relayed to the Environmental Maintenance Manager and/or Lift Station Manager for response as appropriate. Business hour calls are immediately entered into the IMS which generates a work order. Afterhours calls are routed to the appropriate Manager for response, information is recorded by both the EMS and/or the WWTP staff and entered in the IMS the following business day by City staff.

Section 4
Initial Response

4.0 Goals and Procedures

The goal of the SORP is to document the Wastewater Collection Systems Department procedure for responding to SSOs and to ensure that all responses are effective and consistent. This document is intended to address all types of SSO events and ensure that appropriate efforts are made to reduce the impact on the environment and protect public health from potential health hazards associated with the overflow or backup. The City shall respond upon notification of a SSO event and use its discretion and best judgment to evaluate the occurrence and select the appropriate remediation techniques.

A timely response enables crews to gather important information concerning the cause of the SSO, potential health hazards, and potential environmental impacts. This information enables decisions to be made on a timely and educated basis regarding the correction of the SSO, the containment of the overflow, and notification of the general public, as necessary. In the event of an SSO, the initial response actions taken allow the Department to proceed according to an orderly and organized plan.

The following steps outline the basis for the City's initial response to an SSO occurrence, from the time the Dispatcher receives the call until the SSO is alleviated, contained, and remediated. An information checklist can be found in **Appendix B** for Dispatch and field crews to utilize to ensure all the pertinent information is collected for an SSO. Additional procedures regarding short- and long-term responses and required SSO regulatory reporting are discussed further in Sections 5 and 6.

4.1 First Response

The Environmental Maintenance staff receives reports of potential overflows from multiple sources. Most commonly, reports are made by individuals that witness the SSO occurring and report the situation to the Environmental Maintenance Dispatch Line at (901)529-8025, although calls and overflow response requests are also received from other City crews, employees and divisions, police and fire, or other agencies. During the 14-hour operational period, calls are routed through the Dispatcher and information is entered into the IMS. For each report of a potential sewer overflow, the Dispatcher collects the following information:

- Time and date of call
- Name of person reporting the incident
- Contact information for caller (address and phone number)
- Location of overflow

- Description of overflow
- Any additional observations such as odor, color, duration, etc.
- Any information that may help with response time, containment, and remediation

Calls made after hours to the Wastewater Collections Systems Department are routed to the WWTP, which notifies the Environmental Maintenance Manager for the appropriate SSO response. Calls made by citizens to the Memphis and Shelby County Emergency Management System (EMS) get relayed to the Environmental Maintenance Manager for response. Work performed in the field is tracked in the IMS by address, so the Dispatcher can quickly identify if previous work has been performed at a specific address. If an incoming call has been received previously for the same address, it is assigned the previous record number and becomes an additional report on that address. Any newly identified address is given a new record number in the IMS.

Once the information is entered into the IMS during the normal business hours, the Dispatcher notifies the appropriate crew so they can immediately respond to the location. Information is entered into the IMS the next business day for calls occurring afterhours, however appropriate response crews are initiated immediately after receiving notification of the SSO. The first responders to the location of the overflow consist of a Stoppage Operator and crew person(s). There are currently approximately 10 stoppage crews available to respond to overflow calls at any time.

When a call is received after the operating hours of the Dispatcher, the EMA routes all calls from citizens to the Environmental Maintenance Manager. The Environmental Maintenance Manager then follows the procedures outlined above and confirms the presence of a release from the system. If a SSO is confirmed, the appropriate crews are mobilized to the location.

The following is a description of the step-by-step procedures taken to resolve an overflow. A general flowchart is included in **Appendix C** that can also be used as a quick reference for the initial response to SSOs.

4.2 Confirm Sanitary Sewer Overflow

4.2.1 Manhole SSO

When a verified report is received that the occurrence of a wastewater release is potentially occurring, a Stoppage Operator responds to the scene to confirm whether or not there is a release. Stoppage Operators are the lead agents for the City's response and are typically experienced staff, familiar with the system and the SSO response protocol. Until field confirmation of an overflow occurrence is made by the Stoppage Operator, the site is not considered an SSO.

Once a visual confirmation or evidence of an overflow via field confirmation is made, the Operator takes a picture(s) of the overflow for documenting purposes. Next, the Stoppage Operator begins to try to ascertain the source and cause of the discharge or the origin of the flow. This determination may vary depending on the type of release.

4.2.2 Lift Station SSO

Alarms at the lift stations can be received 24 hours per day. Alarms are monitored at the Lift Station Shop during the normal business hours (Monday – Friday 7:00 a.m – 3:00 p.m) and by the Memphis and Shelby County EMS after hours. The appropriate Station Engineer responds to calls, regardless of location, and the responding crews are responsible for the investigation and correction of alarms. After hours, the EMS notifies the appropriate Lift Station Engineer using the designated call list. Service trucks are available to all crews at all times and are equipped to respond to calls. If a Lift Station Engineer cannot resolve a lift station issue, the Supervisor is notified, and additional action is taken.

4.3 Determine Whether Suspicious Substances May Be Present

When arriving on the site of the SSO, the Stoppage Operators shall determine if there are any potential suspicious substances in the discharge. If there is an oily sheen to the liquid or a strange odor, for example, the Stoppage Operator shall notify Dispatch and the Environmental Maintenance Manager and advise that there may be a possibility of a hazardous or potentially dangerous material. The Stoppage Operator will wait for guidance regarding appropriate actions.

If directed, the Stoppage Operator shall establish a control zone and wait for a hazardous materials (HAZMAT) team or appropriate agency before proceeding. The Stoppage Operator shall take direction from the lead of the team until the area is deemed safe, at which time the crew shall proceed with containment and remediation.

4.4 Locate the Disruption and Assess the Impacted Area

The Stoppage Operator shall have access to the appropriate map(s) of the WCTS upon arrival on the scene to determine the infrastructure configuration in the area of the overflow. The mapping shall define the investigation points to be evaluated, such as downstream manholes, to define the extents of the blockage. After locating the release and the location of the blockage, the Stoppage Operator and crew shall utilize their resources to clear the blockage and identify the root cause to the best of their abilities. Section 7 discusses the training available to Stoppage Operators and crews. The Stoppage Operators understand that a SSO can occur anywhere in the WCTS and that each SSO may therefore require a unique plan of action based on location and other circumstances. The crew should determine the resources necessary to remedy the blockage and provide the necessary jetting, vacuuming, rodding, or other technology necessary to clear the obstruction. If unusual situations exist, the Stoppage Operator

shall immediately call the Supervisor or Environmental Maintenance Supervisor to develop an appropriate plan of action.

After locating and clearing the disruption, the next step is to identify the total impacted area. The Stoppage Operator, or designated personnel, shall canvas the area to determine what potential impacts are present to the environment and/or the public and shall identify the appropriate steps to minimize/mitigate those potential impacts. Factors to be included in evaluating the impacted or potentially impacted area, include, but are not limited to, the proximity of the release to the following:

- Streams, reservoirs, wetlands, and other natural waterways;
- Stormwater infrastructure (inlets, curb and gutters, etc.);
- Public use areas; and
- Special facilities including schools, public parks, walking trails, etc.

4.5 Establish Control Zones (Public Property)

When the area impacted by the overflow is identified, the next step of the initial release response stage is to develop and implement a control zone around the impacted area. The control zone will help prevent public access to the affected surface area using appropriate barricading practices. If the control zone includes roadways, then appropriate traffic control measures are taken to protect the public and department personnel. Barricades shall only be used if a manhole has been displaced in a street. The limits and duration of the most appropriate control zone plan will vary on a case-by-case situation.

4.5.1 Location of Control Zones

Although the location of temporary signs and barricades will vary for each site, the goal shall always be to warn the public (if needed) to avoid contact until the completion of cleanup.

When possible, the control zone shall be posted:

- Just beyond the limits of the impacted surface area;
- Near high pedestrian and/or vehicular traffic areas; and
- At other appropriate locations.

4.5.2 Duration of Control Zones

Signs and barricades shall be posted as soon as the overflow is confirmed and shall remain in place until cleanup activities are complete. The timeframe may vary, depending on the extent of the response activities, which, in extreme events, may

include significant mitigation and clean-up requirements. The control zones are in place to not only ensure the safety of the public but, also, of the crew responding and working on the clearing of the SSO.

4.6 Identify Resources and Technique Requirements

The Department shall use all necessary response procedures and implement essential methods so that the goals of the SORP are met and the overflow is stopped and the flow contained and mitigated.

The following resources are available, as needed, and a complete listing of currently available equipment can be found in **Appendix D**:

- Skilled and trained personnel
- Excavation equipment
- Pump and haul equipment
- Portable generators
- Sewer cleaning equipment
- Closed-circuit television (CCTV) equipment
- Repair parts and materials
- Other material, such as sand bags, silt fences, signs, disinfectant, etc.

The Environmental Maintenance Manager or Shift Supervisor shall identify the necessary resources and techniques based on site accessibility, location of the disruption of service, size of the impacted area, and the opportunities to minimize any impacts to the environment and the public.

In an emergency situation, the Department can initiate special procurement or contractual processes to access additional resources from outside contractors as needed. Immediate procurement of services and equipment requires the Public Works Director to declare an emergency, along with the approval of the Chief Administrative Officer for the City.

4.7 Isolate or Contain the SSO

Containing overflows is performed through the establishment of a physical barrier to control further dispersal of wastewater, thus reducing potential adverse impacts. The appropriate barriers and containment zones will vary, based on the site, and will be developed on a case-by-case basis. An appropriately developed and established containment plan will consolidate the wastewater into a defined area. Sand bagging or other constricting methods may be used when site and weather conditions allow,

and entry points into the storm water system may be obstructed using various methods including sand bags, inflatable plugs, or redirecting flow using construction equipment to "dam up" areas and temporarily pump the flow from a sump area.

When possible, flow retrieval and diversion techniques should provide an effective means of controlling the release and returning it back into the WCTS. This procedure reduces additional potential impact on the immediate area and the possible impact downstream.

4.7.1 Flow Retrieval and Diversion Techniques

The flow retrieval and diversion techniques employed by the Department when practical include, but are not limited to, the following:

- Pump and Haul Procedures - Pump and haul equipment provides an additional resource for the collection of discharged wastewater and its conveyance back to the WCTS system, beyond the location experiencing the service disruption. This equipment can be used in conjunction with other containment measures or independently. Typically, this would include a vacuum truck. This equipment may not be effective in wet-weather situations.

- Temporary Diversion - In extreme cases and where appropriate, the Department shall control the point of release such that the release is redirected to a less sensitive waterway or area using mechanical methods for dewatering.

Once the SSO is stopped, the stoppage operator shall provide notification to the Dispatcher (if during normal business hours), or to the Environmental Maintenance Manager (if during night hours), who shall enter and track this information in the IMS system.

4.8 Mitigation/Remediation Solutions

The type of mitigation and remediation will vary depending on the cause of the overflow. The timely use of flow restriction devices/practices is the most effective instrument to reduce any additional negative impact on the environment. Wet-weather SSOs are usually caused by significant amounts of infiltration and inflow (I/I). Mitigation is difficult in these situations, until the wet-weather event which triggered the release subsides, at which time the City shall implement practices to clean and disinfect the overflow site as necessary. Additional pumping capacity can assist in wet weather situations, if other problems are not created downstream or elsewhere in the sanitary sewer system.

Dry-weather events shall be addressed using several methods. Field personnel should identify the most effective method or combination of methods to return service to the system. Stoppage Operators typically wash/flush the line, first, to break the blockage. However, CCTV is also used, when necessary, to determine if there is a greater concern within the service disruption. CCTV inspections can identify the cause and

location of the problem and help identify the necessary techniques needed to eliminate it.

4.8.1 Abatement Resolution Techniques

The following common abatement resolution techniques can be used independently or in combination, depending on field conditions:

- Pipeline Failure – An emergency pipe repair is required to replace the defective or collapsed pipe. Necessary containment and diversion procedures shall be in place until the appropriate repairs are completed.

- Grease/Roots/Other Blockages – Combination cleaner/flusher equipment is commonly used to remove any grease, roots, or other obstructions from the line. In specific situations, a root cutter attachment may be necessary to remove the obstruction.

- Pump Station Failure – Pump-and-haul methods and/or bypass pumping shall be used until the mechanical, electrical, instrumentation, or other needed repairs are completed at the lift station, unless there is adequate capacity in the wetwell or in-system storage to contain the wastewater flow into the station. In the event of lost electrical power service to a lift station, the Department has portable generators and portable diesel pumps available to provide temporary power to two lift stations in the system, as well as two stations (1525 Kimbrough and 2820 Harbor) that have stationary on-site emergency generators.

4.9 SSO Clean-up (Public Property)

The extent of the cleanup and the methods for cleaning will vary depending on the exact nature of the clean-up. Methods to be used include vacuuming or other removal of spillage, use of disinfectant in isolated areas, flushing, and other measures to disinfect and/or remove the residual from the areas which are potentially contaminated by wastewater.

4.9.1 Common Clean-up Practices

The Stoppage Operators employ common practices as appropriate to an individual cleanup situation, and include the following:

- Manual Practices - Manual clean-up techniques include the use of hand tools, such as rakes, shovels, brooms, etc., to remove and properly dispose of readily identifiable material (wastewater solids, papers, plastics, etc.) which originate from the WCTS.

- Mechanical Practices – Mechanical clean-up techniques utilize vacuum trucks and similar equipment to remove solids and remaining standing wastewater and properly dispose of them. Wastewater can be pumped back into the system;

however, this is evaluated on a case-by-case basis. Flushing trucks may be used to further clean areas, as needed. Flushing water is then vacuumed and removed.

- Disinfection Practices – Apply bleach, lime, or other disinfecting and deodorizing agents to isolated areas, as required, to protect public health.

4.10 Conduct Follow-Up Inspection

After remediation, the City shall follow up with an inspection to ensure the SSO, determined to be the City's cause, has been adequately cleaned. The follow-up inspection should generally begin within 2 working days of the remediation. Follow-up action also includes an evaluation of further repair work or program scheduling, as necessary, to minimize or eliminate the occurrence in the future. In most cases, the City's contractor shall follow up on SSO locations and CCTV and clean the line for a specified distance determined by the Environmental Maintenance staff. If additional issues are determined during the follow-up exercises, they shall be reported to the Environmental Maintenance staff for further remediation or repair.

Additional short- and long-term responses are determined after the follow-up inspection and are discussed in Sections 5 and 6.

4.11 Public Information

The Public Works Director or appropriate designee is responsible for contacting the media, the public, or other government entities at the City's discretion, or other communications outlets as needed based on the occurrence of an SSO that requires public notification. The Director or designated personnel shall answer questions from the public and/or the media about the Department's response to the SSO, when necessary.

Deliverable reports of SSOs required by the Consent Decree shall be included in the Public Repository and made available online.

4.12 Water Quality Monitoring

Water quality monitoring shall be conducted after SSOs greater than 100,000 gallons have discharged into surface waters. Water quality sampling shall be conducted to determine the pH, dissolved oxygen, and *E. coli* concentration of the receiving stream to determine the effects of the SSO. Monitoring shall be conducted in compliance with water quality samples already collected within the City and sent to an outside laboratory for analysis.

4.13 Building/Private Property Backups

Events causing backups into buildings or sewer overflows entering a private building require additional investigations to determine if the backup is a result of a problem in the City's system or the result of failure on the private customer's side. To determine responsibility for a backup, the Stoppage Operator will need to determine the location

of the cause of the backup. If the investigation process does not reveal a problem in the City's system, the Department shall advise the customer the overflow is their responsibility.

The Department addresses backups into buildings/private property as a result of a backup from the Department's WCTS by:

- Responding to the scene and evaluating the situation;
- Taking appropriate action to limit exposure of the public to the wastewater spill;
- Evaluating responsibility for system failure or backup;
- Making repairs and/or performing system maintenance in the Department's system, if the backup is the result of a problem in the City's WCTS.

The Stoppage Operator will initially inspect the customer's cleanout, if accessible, to determine if the stoppage is between the cleanout and the City's mainline based on the following steps:

Step 1a. If the private service lateral is not retaining wastewater at the cleanout, then the cause of the disruption is most likely located within the private service lateral, but additional investigations shall be made to verify the initial assessment.

Step 1b. If the private service lateral is retaining wastewater at the cleanout, then the cause of the disruption is between the cleanout and the main. Therefore, additional investigations are required to determine if the blockage is associated with the main or in the remaining portion of the private service lateral.

Step 1c. If no cleanout is present, then the Stoppage Operator shall verify the proper operation of the main, via inspection, washing, etc., and request that the customer have a cleanout installed at the property line, so additional investigations can be performed.

Step 2. The Stoppage Operator shall inspect water levels in the adjacent manholes to determine if the backup is caused by a blockage in the main. The next downstream manhole with respect to the blockage will be inspected for high wastewater levels. If no wastewater is flowing in the downstream manhole, or if a significant change in flow is observed in the downstream manhole, then the upstream line shall be flushed.

If the blockage is determined to be the City's responsibility, the Stoppage Operator shall advise the Owner and contact the

Environmental Maintenance Manager or supervisor to begin the clean-up process.

Step 3. If the Stoppage Operator inspects the adjacent manholes and no evidence of a blockage is found in the main, then the Operator shall advise the customer that it is a private property issue and to contact a plumber to resolve the disruption.

If the property owner disputes the determination, the City will dig down at property line and install a cleanout, but cost must be paid by homeowner, if it is determined to be a private property issue (approximately $1,300).

4.13.1 Measures to Eliminate Building/Private Property Backups

Wastewater backups that are a result of an on-going structural problem within the City's WCTS require an on-going cleaning program to prevent future private property backups, until some date in the future when the problem can be eliminated. These problem areas are identified and placed on a list for routine cleaning. Program supervisors are responsible for managing this list and shall schedule personnel to clean these areas on a planned basis. The typical method used by the Department in cleaning sewer lines with on-going problems on a regularly scheduled basis utilizes jet trucks, either operated by the City or its contractors.

4.13.2 Public Information for Building/Private Property Backups

The public can file a claim with the Department in the event the SSO occurs, causing a building backup within a residence, that is caused by the City's main. The claims procedure is posted on the City's website and outlines the following steps for residential customers regarding building/basement backups:

- STEP 1: Call the Environmental Maintenance (EM) Dispatcher at (901) 529-8025 immediately when a SSO is discovered in the home or basement.
- STEP 2: Provide the EM Dispatcher information such as name, address, phone number, and nature of the problem.
- STEP 3: Follow instructions provided by the EM Dispatcher, such as locating service line cleanout and removing its cap.
- STEP 4: EM crew will respond and take corrective action on the cause of the backup.
- STEP 5: EM staff will determine the type and location of the problem (i.e., roots in service line, grease in mainline, etc.)

- STEP 6: Based upon the evaluation above, EM may utilize a contractor for clean-up activities.
- STEP 7: For costs associated with damaged appliances, furniture, or clothing, a claim must be filed with the City's Claim Department.
- STEP 8: To initiate a claim, residents must contact the Claims Department via phone at (901) 636-6616.

The City uses an independent cleaning and restoration contractor to assist in cleaning, sanitizing, and repairing damages caused by SSOs that are directly attributed to blockages or structural failures within the WCTS. Restoration contractors are experienced in this type of cleaning and restoration work and are under contract with the City of Memphis. Any additional costs must be filed via a claim with the City's Claims Department.

4.14 Regulatory Reporting

Upon the occurrence of a SSO, the City of Memphis shall perform the appropriate notification per its existing NPDES permits. The Wastewater Collection Systems Administrator shall provide an oral report within 24-hours after the time a SSO is observed to be a threat to public drinking water supplies or to human health or the environment. The oral report shall include the location of the SSO and shall be given to:

Eddie Bouzeid
Tennessee Department of Environment and Conservation
Memphis Field Office
(901) 371-3023

Notification of building backup remediation is not required by this SORP or the City's NPDES permit if the City can complete the remediation within 24 hours. A written report shall also be required within 5 days of the SSO and is discussed further in Section 5.

4.15 Sewer Overflow Tracking and Identification

SSOs are tracked through hard-copy sewer maps that divide the City into numerous sections, or map pages. These maps are kept current with each SSO that occurs within the City's WCTS. The maps are kept up to date within the Wastewater Collection Systems Department for staff viewing and are generally updated by a single person responsible for tracking overflow information. Requiring a single person to track the overflows ensures all the data is represented the same way and is kept in a central location. The occurrence of an SSO is coded using a variety of colored circles and squares which correspond to the year of the past SSOs within each map page. An example of a hardcopy map page used for SSO tracking can be seen in **Appendix E**.

SSOs are tracked on the sewer maps of the City which correspond to the map book pages associated with a square on the Excel tracking sheet that provides an overall historical look at the system's performance. An example of this tracking map can also be seen in **Appendix E**. Overflows are tracked from the beginning of the year to the present month, for the entire calendar year, and on a 5-year basis. Historical trending can be seen in the sheet tracking SSOs by the differing colors representing the quantity of overflows.

In addition to historical tracking, the Department is in the process of developing a list of locations within each sewer basin that have been recorded as overflowing more than once in a calendar year. These locations shall be monitored by Environmental Maintenance as prime potential candidates for overflows during a large storm event. In addition to potential inflow- and infiltration-induced overflows, the City has identified critical locations for all potential lift station failures with a pumping capacity greater than 1,000 gpm within the WCTS.

A preliminary listing of the anticipated areas where an SSO is most likely to occur from a lift station failure are listed in **Appendix F**. This list is a dynamic listing and shall be updated based on WCTS and lift station improvement projects, the gathering of additional SSO data, and continuous system maintenance. The 81 lift stations that shall be monitored at a central location via telemetry (i.e., SCADA) shall not be included within this listing. Memphis shall use this listing to conduct inspections after rain events for potential SSOs in locations where a lift station failure is observed through the SCADA monitoring system.

In order to estimate the impacts of lift station failure, calculations were performed for stations larger than 1,000 gpm to assess the amount of lift station wetwell storage to estimate the length of time that the station could be out of service until a potential overflow occurred. These results are presented in **Appendix G**. To determine these numbers, wetwell volumes and pump runtimes were correlated to determine the average storage time based on flows continuing to enter the lift station at the same average flow rates typically observed. The impacts of a lift station failure on any adjacent, smaller-diameter sewers were not analyzed in these calculations. Additionally, the need to hold the system hydraulic grade line lower, potentially to reduce the possibility of building and basement backups, was not analyzed. Therefore, backups into homes could occur more quickly if there are homes within the subbasin that have finished floor elevations lower than the fluid level in the wetwell. These particular aspects of the system may be analyzed individually on a case-by-case basis.

Storage times may be extended or shortened, depending on the flow rate into the stations. The City will be installing SCADA monitoring at each of the 81 lift stations by March 2012, limiting the amount of manual inspections required to locate overflows from lift station failures.

The City currently has a SOP for a Blockage/Flood Call (#3.2.1 SP) and for a Lift Station General Response to an Alarm (#3.5.1 CS). These SOPs, provided for reference in **Appendix H**, provide the stoppage operators with the necessary steps to address SSOs and minimize overflow volumes.

Section 5
Short-term Response

5.0 Critical Response Actions

The response actions to be completed within 5 days of a SSO event (short-term response) include verification that policies and procedures were followed, based on the SORP in regards to the response to the SSO and completion of the proper reporting procedures to TDEC. The actions to be completed within 5 days of an SSO provide information required for future reporting, monitoring, and taking steps to prevent SSOs from occurring in the same location in the future. The five important questions to be addressed, as shown in a general flow chart in **Appendix I,** are listed below:

1. Is the initial site cleanup adequate? If yes, no further action is required. If no, the cleanup must be completed. This applies for residential and public SSOs within the system.

2. Is additional corrective action needed? If yes, and the additional actions can be completed internally, the Environmental Maintenance Manager or supervisor shall dispatch crews. If the additional corrective actions cannot be handled internally, the Wastewater Collection Systems Administrator or Environmental Maintenance Manager notifies the on-call Contractor to schedule and complete. If no, no further action is required.

3. Was additional corrective action adequate to solve the basic cause of the overflow? If yes, no further action is required in the short term. Continue to monitor and schedule detailed field investigations to determine the basic cause and verify correction action is sufficient. If no, schedule detailed field investigation to determine the basic cause and to identify the necessary corrective action(s). If the SSO is still flowing, field crews shall continue to contain or direct the overflow to minimize the public health and environmental impact.

4. Is a Contractor required? If yes, a request for a contractor shall be initiated. If no, continue to use internal crews to complete the necessary additional corrective action.

5. Is the short-term corrective action taken with the assistance of a Contractor adequate to correct the basic problem and prevent future overflows? If yes, then no further actions are required other than verification. If no, determine the scope for a major contract to fully correct the underlying cause of the overflow. Complete the corrective work as part of the long-term response.

5.1 Sanitary Sewer Overflow Reporting

To the extent required by the City's NPDES permit, a letter to the TDEC representative is written to record the information for the SSO within 5 days of the overflow event. A template for this letter can be seen in **Appendix** J. Information for this letter is relayed from the Stoppage Operators to the Dispatcher, who records this information for the Wastewater Collection Systems Administrator, who in turn completes this reporting form within 5 days of the overflow. The following subsections provide a detailed description of the required information for each field to be completed on the letter. Records of these notifications are kept for a minimum of 5 years from the date of the SSO.

5.1.1 Time and Date Notification Received

This first field is the date the Wastewater Collection Systems Administrator or Environmental Maintenance Manager first notified the TDEC representative that an overflow had occurred. Where required, this call is typically after the overflow has been stopped but would be completed within 24 hours of the time an overflow was observed.

5.1.2 Location

This field is the location of the overflow, identified by cross streets, manhole number, lift station, and/or latitude and longitude.

5.1.3 System Component

This field records a description of the WCTS component from which the SSO was released (manhole, crack in pipe, lift station wetwell, or other).

5.1.4 Suspected Cause of the Overflow

This field records the cause or suspected cause of the SSO (blockage, broken down, dried out, flooded, line break/forcemain/air release cause, grease, power outage, lift station failure, or other cause).

5.1.5 Description of Action Taken

This field provides a brief description of the actions taken by the Stoppage Operators to minimize the volume from the SSO and steps taken to respond and clean up the SSO.

5.1.6 Volume

This field is the estimated volume of the SSO. The volume estimation is completed using the San Diego Wastewater Collection Systems Division Manhole SSO Estimation method provided in **Appendix K.** This entails comparing the overflow to

the San Diego Reference Chart which is a method for estimating spills up to a volume of 275 gallons per minute.

5.1.7 Time SSO was Stopped

This field allows the time and date the SSO was stopped, or the time and date when the SSO is anticipated to be stopped.

5.1.8 Stream Affiliation

This field is a description of the receiving water the SSO discharged into, if applicable. The name of the stream should be listed, if known. Otherwise, list the stream as a tributary to a larger receiving water. If there are no stream affiliations, this information must still be provided indicating there were no impacted waterbodies.

5.1.9 Affected Human Contact Areas

This field allows for a brief description of the known affected human contact areas near the SSO, if any.

5.1.10 Previous SSO Date

This field uses the historical tracking of SSOs and determines when any previous SSOs have occurred at this location. Map books are consulted to complete this field. If this is the first time an SSO has occurred at this location within the previous 5 years, it should be stated in the letter.

5.1.11 Follow-up Action

This field describes the follow-up additional action as determined from the weekly progress meetings held by the Department. Follow-up work typically performed by a Contractor should be included in this field and includes additional investigations, CCTV, preventive maintenance, and other additional preventative work completed.

5.1.12 Public Notifications

This field describes the public notifications and notifications to other agencies or departments, should an SSO impact the public or the environment to the level of requiring public notification. This shall be determined on a case-by-case basis.

5.2 Incident Review Process/Overflow Review Meeting

In the event of a critical system component failure, such as a lift station failure or a breakdown in response to a wastewater issue, the Wastewater Collection Systems Administrator shall initiate a WCTS incident review during the weekly Overflow Review Meeting.

The Overflow Response Program team generally meets twice a month to review the overflows that have occurred since the last meeting, identify the proper follow-up corrective action(s) that should be taken, discuss the results of the corrective action(s) that have been completed on past overflows since the previous meeting, and discuss the status of outstanding overflows for which appropriate corrective actions have not been completed. The information and notes from each meeting is summarized and captured in internal memoranda: one covering the newly discussed overflows from the most recent period, and one covering the outstanding overflows from the previous periods. The outstanding overflows continue to be tracked by the Overflow Response Program team until all members are satisfied that sufficient investigation and/or effective corrective actions have been undertaken and completed.

5.2.1 Overflow Corrective Action

The corrective action approach determined from the above-mentioned meeting is selected based upon the recorded observations made by the Stoppage Operator during the initial cleaning of the blockage and the history of overflows at the location. The corrective action options usually evaluated include:

- Hydraulic washing and vactoring of the line by the contractor upstream of the overflow location and downstream of the location to the outfall;
- Confined space entry to remove debris, large foreign objects, and any other materials that cannot be recovered from the surface using a manual grabber or by vactoring;
- Chemical treatment to remove grease;
- Point repair;
- Excavation to remove objects (i.e., utility cross boring, etc.);
- Cleaning with a drag machine;
- Cleaning with a hydraulically driven root cutter;
- Placement on a preventive maintenance list; and/or
- Scheduling a grease trap inspection.

5.3 Notification to the Public in Affected Areas

The Wastewater Collection Systems Administrator instructs staff to post notices at the affected areas that are readily visible to the general public, if the SSO poses a short-term health risk or environmental impact. Public access is limited with area barricades

and/or temporary signage. If the SSO poses a long-term impact or health hazard, the Administrator shall contact the local media outlets to post warnings to the general public, as well as provide instructions on what the public can do to limit their exposure and help eliminate the SSO. The Administrator shall also post a follow-up message to the general public appropriate to the nature of the event once the SSO has been corrected to inform the public what measures were taken, what will be done in the future to prevent the SSO, and to inform the general public on what they can do to help reduce/eliminate future SSOs. Public notification is determined on a case-by case basis by the Administrator and/or the Public Works Director.

Section 6
Long-term Response

Long-term actions are critical in order to prevent the recurrence of a SSO event at a specific location. There are three critical questions to be answered during the long-term response phase to prevent the recurrence of a sewer overflow, as shown in **Appendix L** and identified below:

1. Is a consultant required to evaluate the cause of the SSO and identify appropriate long-term corrective actions? If yes, the request is processed by the Wastewater Collection Systems Administrator. If no, the Environmental Maintenance Manager requires the location to be monitored for future overflows by internal staff.

2. Is the basic cause of the SSO capacity related? If yes, the Wastewater Collection Systems Administrator authorizes a capacity evaluation to determine the appropriate solution. If no, the modifications required to the collection system to eliminate the hydraulic restriction are determined, or the basic root cause of the blockages are defined and corrected.

3. Will more frequent cleaning eliminate the cause or prevent future overflows? If yes, the Administrator shortens time between cleanings and places the area on a regular preventative maintenance list. If no, the Administrator retains the cleaning schedule and monitors the location.

6.1 Reporting

Memphis shall maintain all SSO reporting records for a minimum of five years from the date of the SSO. All records documenting the steps taken to prevent the SSO from recurring, including work orders associated with the investigation and repair activities shall be maintained. The City shall also maintain a description of the complaints from customers or others regarding SSOs for a minimum 5-year period.

Section 7
SORP Training Procedures

7.0 Introduction

This SORP is a living document to be updated as personnel, systems, and response and remediation protocol change. Equally important to the creation of the plan is training of personnel on the plan content and appropriate use. This section of the SORP describes the review, approval, and update process, and necessary training programs for the Department.

7.1 Plan Review, Approval, and Update

This SORP shall be reviewed and approved periodically by the Environmental Maintenance Department of the Public Works Division at an average of once every two years and as other significant changes to the SORP protocols occur.

7.2 Safety Training for All Collection System Personnel

The safety program is anchored with support from the Director of Public Works and includes providing sufficient resources, periodic review, and the establishment of safety-oriented goals.

The Safety Coordinator reports to the Administrator of Environmental Engineering and works closely with other administrators, managers, supervisors, and employees regarding various safety issues, programs, training, and record-keeping. A Safety Manual details the procedures for the various concerns, such as confined space entry. The Safety Manual is placed at each installation for reference by supervisors directly responsible for job planning to ensure safe work practices are followed.

The City of Memphis Public Works Division shall conduct training for the appropriate response crews and support staff to ensure their compliance with the SORP. Training sessions shall be organized based on the latest SORP, as well as other reference materials. These training sessions are important to reinforce the SORP protocol; however, the prime component of the training program shall be a practical hands-on field component to ensure all response personnel are prepared for all anticipated situations. In addition, the Environmental Maintenance Department shall conduct refresher sessions as significant changes are made to the substance of this SORP within 90 to 180 days after EPA approval, if applicable, to ensure department-wide compliance with the document . The Administrator of Environmental Maintenance oversees the SORP to ensure that the established procedures are being followed during implementation and field operation.

In addition to training on the SORP implementation, the Department also conducts safety training based on the day-to-day safety hazards associated with the

Departments work. Personnel that respond to a SSO call or perform minor sewer repairs and construction receive the following additional safety training:

Confined Space Entry Safety Training – This training is designed to instruct employees on proper procedures as defined in OSHA 29 CFR 1910.146. Safety equipment includes a confined space entry trailer with appropriate gear and air monitoring instruments. Air monitoring instruments are calibrated on a monthly basis utilizing an instrument docking station. Confined Space Entry Training includes the following:

- Hazardous Conditions
- Safety Devices
- General Safety Practices
- Reclassified Non-Permit Confined Spaces

A Confined Space Entry Program is in place in the Environmental Department. Under this program, all field employees are trained in confined space entry protocol and procedures. Permit spaces have been identified at all facilities and employees are required to complete a confined space entry permit prior to entry. Copies of the completed confined space entry permits are sent to the Safety Coordinator for filing.

A respiratory protection program is also in place in the Environmental Department. Employees who are required to wear a respirator undergo an initial medical evaluation and fit-testing prior to issuance of a respirator.

External Training – Employees are routinely sent to the National Utility Contractors Association (NUCA) certified training. Lift station crews are also sent to lift station schools offered by manufacturers and vendors to receive additional specific training on the equipment at the stations.

Additional Routine Training – The following are additional routine training courses provided to maintenance employees:

- Flagger
- Defensive Driving
- CPR/AED
- Miscellaneous Safety Training

7.3 Training

The Department shall provide training to ensure the SORP is effective in managing a SSO response. This training shall provide the means for those involved to acquire skills which shall fulfill their roles during an emergency. Training on the SORP can also help to determine the effective processes and what can be improved to better

respond to and repair the causes of the SSO, so that revisions to the plan can be made accordingly.

The types of training to be utilized are described above and include formal and hands-on, on-the-job training. The Department has identified personnel that shall receive training. In addition to the periodic training, training shall also be conducted when the following occurs:

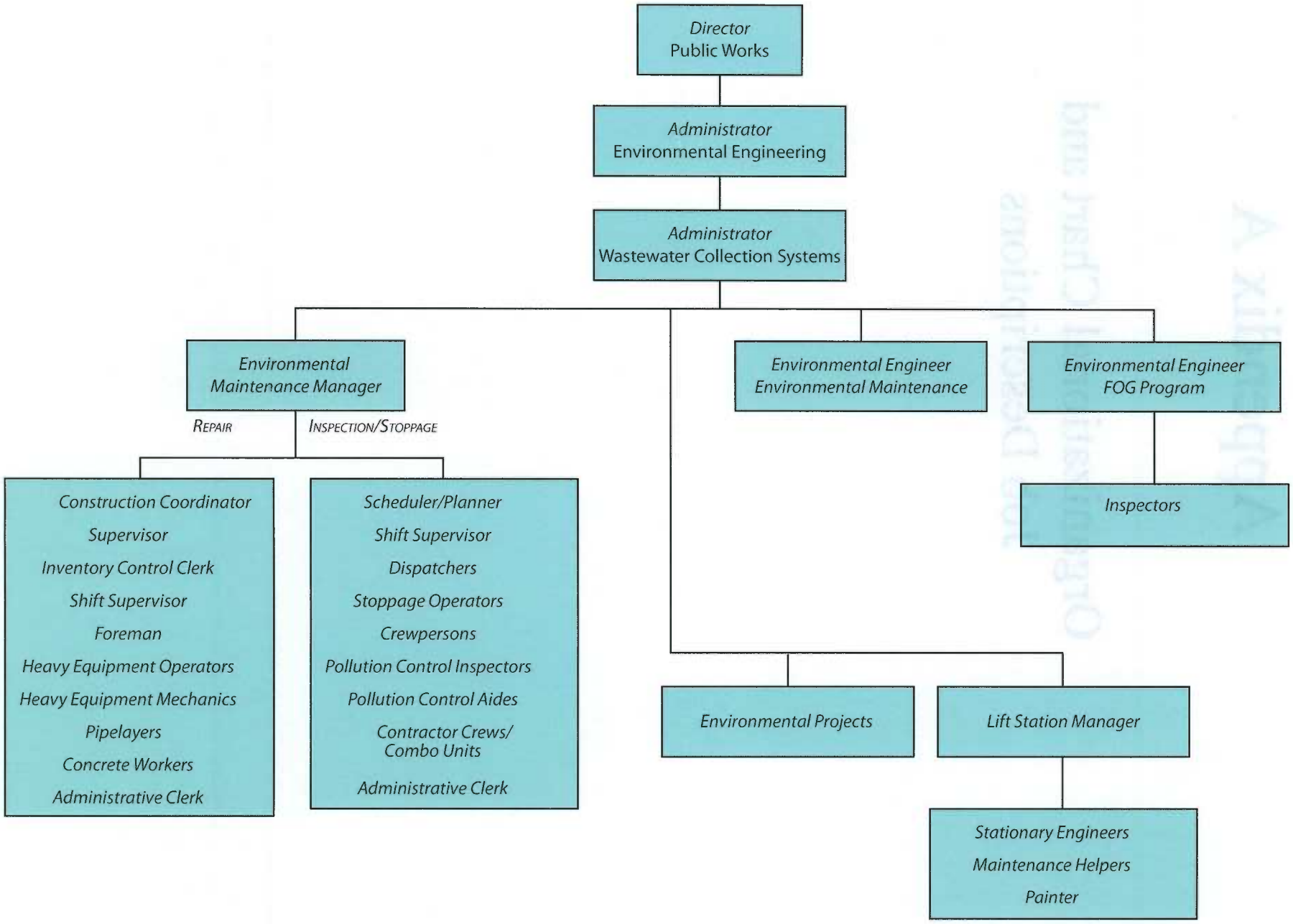
- New employees are hired who are responsible for implementing the plan.
- Special emergency assignments.
- Equipment or materials are introduced that could alter the response procedures.
- EPA approval of significant revision of substantive changes to the SORP, if applicable.

The orientation sessions should include basic instruction and explanation of the SORP procedures. Comprehension of training sessions is evaluated in the field by the Stoppage Operators.

Appendix A

Organizational Chart and Job Descriptions

City of Memphis
Public Works Organizational Chart



JOB TITLE: Environmental Engineer
DIVISION: Public Works
SERVICE CTR: Environmental Mnt.(CMOM program)
FLSA: Exempt

JCC#: F052EV
DATE: 6/5/2002

ESSENTIAL JOB FUNCTIONS: Works under the direction of the Manager of Environmental Maintenance to manage and provide technical support for major programs and projects in Environmental Maintenance such as the Capacity, Management, Operation, and Maintenance (CMOM) program. Supervises and evaluates a staff responsible for inspecting and maintaining the City's sewer lines including ensuring compliance with all OSHA/safety program regulations and guidelines; and directs and reviews the work of outside contractors. Manages programs to maintain compliance with all Federal Environmental Protection Agency and State of Tennessee regulations and requirements. Interprets and analyzes field data and reviews plans; performs detailed engineering calculations; maintains related data and prepares reports required by the EPA and the State of Tennessee. Responds to inquires and communicates on a regular basis with professionals and the general public regarding sewer problems. Researches and employs new developments in engineering techniques, methods, and materials in the operation of the wastewater collection system. Prepares budget estimates, specifications, and monitors daily expenditures.

OTHER FUNCTIONS:
1. Performs additional functions (essential or otherwise) which may be assigned.

TYPICAL PHYSICAL DEMANDS: Must be able to communicate clearly verbally and in writing with management, staff, and the public. Requires visual acuity to read pipeline schematics and inspect designated areas related to sanitary sewers, traversing uneven woods, weeded areas, and flood lands, and some lifting and carrying objects such as engineering equipment weighing up to 25 lbs. Requires the ability to operate general office equipment such as a personal computer and telephone and specialized engineering equipment. Requires frequent use of an automobile to make on-site inspections.

TYPICAL WORKING CONDITIONS: Work is performed in an office and at sewer construction/repair sites throughout the City including exposure to sewer fumes and gases and changing weather conditions and temperatures.

MINIMUM QUALIFICATIONS: Bachelor's degree in Civil Engineering and four (4) years experience in environmental engineering and enforcement programs with at least two (2) of the four (4) years in a supervisory/lead capacity; or any combination of experience and training which enables one to perform the essential job functions. Must possess a license to practice engineering in the State of Tennessee or a state that has reciprocity with Tennessee. Before the end of 24 months of employment must take and pass written examination for State of Tennessee Class II Wastewater Collection License as condition of continued employment. Must possess a valid Tennessee driver's license.

****

Eric V. Johnson 6/5/02
WRITTEN BY: DATE:

REVIEWED FOR ADA: R2B
6-6-02

Clifford L. Smith 6/6/02
EEO REVIEW: DATE:

6/12/02
DIVISION APPROVAL: DATE:

NOTICE OF JOB OPENINGS

EMPLOYMENT SERVICE CENTER

CITY OF MEMPHIS

SEPTEMBER 22, 1993

Applications will be accepted from 8:00 A.M. until 5:00 P.M. in the Employment Office, Room 1B-33, City Hall, 125 North Main until

OCTOBER 01, 1993

THE CITY CHARTER REQUIRES THAT CITY EMPLOYEES MUST ESTABLISH RESIDENCE WITHIN SHELBY COUNTY, TENNESSEE WITHIN SIX (6) MONTHS FROM DATE OF EMPLOYMENT.

** THIS POSITION IS PROMOTIONAL ONLY **

POSITION: **ADMINSTRATOR - WASTE COLLECTION FACILITIES** - (1 Opening)
Public Works/Environmental/Administration - J.O. #93-151 - GRADE 00

ESSENTIAL JOB FUNCTIONS: Works under the general direction of an assigned supervisor. Plans, coordinates, and directs activities concerned with maintenance and inspection of the physical sewer system, flood control, operation and maintenance of sewer lift stations, and storm water management: Analyzes trends, such as population and industrial growth of area being served to determine adequacy of current facilities and to project demands for future facilities; develops plans to meet expanded demands and requests engineering staff to design and prepare specifications for extended facilities and capacity; directs activities of designated employees who oversee water and sewage facilities; seeks consultants to perform special studies for the department, reviews bids, and makes recommendation for selection; confers with consultants and management personnel to discuss alternatives and to choose most suitable plan on basis of efficiency and cost-effectiveness; communicates with regulatory agencies to resolve any problems and to coordinate projects; inspects field projects to confirm conformance to specifications and government regulations; researches and evaluates new developments in materials, tools, and equipment and recommends or denies purchase; prepares various reports including monthly EPA report; and prepares department budget.

OTHER FUNCTIONS:

1. Performs additional functions (essential or otherwise) which may be assigned from time to time.

TYPICAL PHYSICAL DEMANDS: Requires ability to inspect work area which may involve walking, sometimes across ditches, along river banks, or in wooded areas. Requires ability to communicate with staff, management, public government agencies, consultants, private contractors, and other City officials.

TYPICAL WORKING CONDITIONS: Work is performed in an office environment and outdoors to inspect field projects and to demonstrate new products.

MINIMUM QUALIFICATIONS: A Bachelor's Degree in Environmental Engineering, Civil Engineering, or related engineering degree, and five (5) years administrative experience in the field of wastewater treatment and/or collection; or any combination of training and experience which enables one to perform the essential job functions. Must possess a valid Tennessee Driver's License. **PROOF OF EDUCATION REQUIRED. (PHOTOCOPY OF LICENSE MUST BE ATTACHED TO APPLICATION).**

SPECIAL REQUIREMENTS: Must possess a current valid State of Tennessee Class II Wastewater Collection License or be able to obtain before the end of 24 months of employment as an Administrator of Waste Collection Facilities.

EQUAL OPPORTUNITY EMPLOYER

JOB TITLE: Manager - Environmental Mnt. JCC#: 71015N
DIVISION: Public Works DATE: 04-13-93
BUREAU: Environmental Mnt.
FLSA: Exempt

ESSENTIAL JOB FUNCTIONS: Works under the direction of the Administrator of Collection System. Directs and coordinates, through subordinate supervisory personnel, activities of workers engaged in repair and maintenance of the City's sanitary sewer system: Reviews and analyzes reports and records and confers with supervisory personnel to obtain data required for planning department activities and to address future needs; gives work direction, resolves problems such as disgruntled property owners, and sets deadlines necessary to meet work objectives; evaluates current procedures and practices and develops and implements alternate methods to improve operations; researches and evaluates new developments in material, tools, and equipment to recommend or deny purchase; reviews new land development projects to evaluate additions and modifications to sewer system; coordinates department activities with inter-related activities of other City departments and representatives of utilities to insure optimum efficiency; prepares various reports for Management, State and EPA; prepares and monitors budget; prepares bid specifications and contracts necessary to requisition tools, equipment, and supplies; inspects work sites to evaluate work requirements; and directs clerical personnel in typing reports and record keeping activities.

OTHER FUNCTIONS:

1. Performs additional functions (essential or otherwise) which may be assigned from time to time.

TYPICAL PHYSICAL DEMANDS: Requires ability to inspect work area which may involve walking in wooded and river swamp areas, climbing, and stooping. Requires ability to communicate with staff, public, utility representatives, other City departments managers, etc.

TYPICAL WORKING CONDITIONS: Majority of work is performed in an office environment but outdoor work is required to inspect work site, new development sites, and to meet with the public.

MINIMUM QUALIFICATIONS: High school graduate with eight (8) years experience in the maintenance and repair of sanitary sewer lines with five (5) of the eight years in a supervisory capacity; or any combination of experience and training which enables one to perform essential job functions.

SPECIAL REQUIREMENTS: Must possess a current valid State of Tennessee Wastewater Collection License and a valid Tennessee Driver's License.

****

Mary Dennison 4-26-93
WRITTEN BY: DATE:

Tom Miles 4-26-93
EEO REVIEW: DATE:

REVIEWED FOR ADA: RHG 4/28/93

CITY OF MEMPHIS

MARCH 01, 2006

EQUAL OPPORTUNITY EMPLOYER

Applications will be accepted from 8:00 A.M. until 5:00 P.M. in the Employment Office, Room 1B-33, City Hall, 125 North Main until MARCH 10, 2006
or visit our Satellite Office at 4225 Riverdale
For a complete listing of job openings please visit web site at www.memphistn.gov

THE CITY CHARTER REQUIRES THAT CITY EMPLOYEES MUST ESTABLISH RESIDENCE WITHIN THE MEMPHIS CITY LIMITS WITHIN SIX (6) MONTHS FROM DATE OF EMPLOYMENT

POSITION: SHIFT SUPERVISOR/PUBLIC WORKS - (1 Opening) **MINIMUM SALARY: $4,710.41 Mo**
Public Works/Environmental Maintenance - **J.O. #06-014** GRADE 12 SM1

ESSENTIAL JOB FUNCTIONS: Works under the general supervision of the Supervisor of Environmental Maintenance. Directs and coordinates through subordinate personnel activities of workers engaged in the maintenance, repair, and/or replacement of the City's sanitary sewer lines, connections, and manholes: oversees personnel providing training, work direction, and evaluation of work performance; evaluates work demands and makes daily assignments; adjusts work schedules to meet work demands and shortage of staff; makes field inspections to review work and to evaluate work requirements such as type of equipment needed; inspects equipment daily, substitutes equipment needing repairs and prepares work order for maintenance required; completes daily activity reports; interprets personnel policies and contract memorandums and conveys to workers; takes disciplinary action according to established practices; confers with workers' representatives to attempt to resolve grievances; and investigates and resolves citizen complaints and requests.

OTHER FUNCTIONS:
1. Performs additional functions (essential or otherwise) which may be assigned.

TYPICAL PHYSICAL DEMANDS: Requires ability to inspect work area which may involve walking in wooded and river swamp areas, climbing, and stooping. Requires ability to communicate with staff, management, public, Health Department officials and other City department supervisors.

TYPICAL WORKING CONDITIONS: Majority of work is performed outdoors to inspect work activities, to evaluate work requirements, and to respond to problem situations. Twenty-four hour, seven-day week operation. Must work assigned shift.

MINIMUM QUALIFICATIONS: High school graduate and six (6) years experience in sewer line maintenance with one (1) of the six (6) years in a supervisory/lead capacity; or any combination of training and experience which enables one to perform essential job functions. Must be on call 24 hours a day for emergencies and possess a valid Tennessee Driver's License. **(PROOF OF DRIVER'S LICENSE REQUIRED)**

JOB TITLE:	Stoppage Operator/Sewer	JCC#:	F556SO
DIVISION:	Public Works	DATE:	12/16/98
SERVICE CTR:	Environmental Inspection		
FLSA:	Non-exempt		

ESSENTIAL JOB FUNCTIONS: Works under the general supervision of a Zone Supervisor to maintain sewer lines through clearing and removing stoppages, obstructions, or restrictions: inspects sewer lines and manholes and performs dye tests/smoke tests, if necessary, to locate the stoppage; drives and operates sewer cleaning equipment such as a flusher, vactor, power rodder, drag machine, etc. to clear the stoppage and applies chemical solvents to aid in clearing the obstruction; enters confined spaces to remove debris from manholes; cleans and disinfects areas such as basements and yards flooded as a result of sewer stoppages; performs routine washing of sewer lines, manholes, and siphons; and directs the tasks of a Semi-skilled Crewperson assigned to assist in these duties. Reports the location of the problem, action taken, and current job status to a dispatcher or supervisor using a mobile radio. Prepares a daily summary report on all activities performed and documents any special job site conditions. Performs light preventative maintenance of vehicles and equipment such as fluid levels, pre-trip inspections, filters, etc.

OTHER FUNCTIONS:

1. Performs additional functions (essential or otherwise) which may be assigned.

TYPICAL PHYSICAL DEMANDS: Must be able to communicate clearly both verbally and in writing. Requires the ability to traverse uneven ground, lift and carry objects such as tools and power equipment weighing up to 50 lbs., and maneuver including stooping, bending, reaching (including above head), pushing, pulling, and climbing into and out of manholes. Requires the ability to drive and operate specialized sewer equipment such as a wash truck and power rodder.

TYPICAL WORKING CONDITIONS: Majority of work is performed in an outdoor environment. Performing job requires exposure to sewage fumes and odors, insects, weeds and poisonous plants, emulsifiers, bacteria, insecticides, sewer solvents, traffic, noise, heat and all types of weather conditions. Must be able to enter confined spaces such as a manhole/sewer line. Requires some contact with the general public.

MINIMUM QUALIFICATIONS: High School graduate and two (2) years experience in sewer line maintenance; or any combination of experience and training which enables one to perform the essential job functions. Must have a valid class "B"Tennessee driver's license with endorsement (C or N) for tanks 1,000 gallons or greater. Must comply with Federal Department of Transportation (DOT) Alcohol and Drug testing rules.

****

Eric V. Sebastian 12/16/98
WRITTEN BY: DATE:

Tom Miles 12/17/98
EEO REVIEW: DATE:

REVIEWED FOR ADA: RZB 12-16-98

12/21/98
DIVISION APPROVAL: DATE:

JOB TITLE: Scheduler-Planner
DIVISION: Public Works
SERV. CENTER: Environmental
FLSA: Exempt

JOB #: [illegible]
REVISED DATE: 5/6/1993

ESSENTIAL JOB FUNCTIONS: Works under the supervision of the Manager of Environmental: Responsible for scheduling work crews to handle sewer repairs and/or sewer stoppages; and directs the work activities of designated staff; receives calls or complaints regarding sewer repairs, and obtains information from dispatchers on sewer stoppages; transfers information to complaint cards and enters detailed data into the computer; runs reports daily to analyze data by using specialized software to determine which repairs should be made priority; reassigns crews to handle emergency repairs; monitors status of repairs to ensure problems are corrected. Provides information or requests MLGW, telephone or cable companies to locate cable/lines; informs private contractors and plumbers of the location of sewer lines, pulls sewer maps or documents, and determines appropriate location by accurately calculating dimensions of sewer location. May occasionally go to job sites to locate sewer lines. Prepares special reports, regarding sewer repairs and maintenance, for administrative personnel in City and County departments, the State, and the EPA agency; maintains maps on sewer line locations. Interacts with the Mayor's Citizen Service Center regarding complaints received, and the City Attorney's office regarding claims filed due to sewer damages. Maintains files and utilizes data to schedule preventive maintenance for sewer systems.

OTHER FUNCTIONS:

1. Acts as supervisor in his/her absence to supervise daily work operations of other areas.
2. Performs additional functions (essential or otherwise) which may be assigned from time to time.

YPICAL PHYSICAL DEMANDS: Requires the use of equipment, such as computer terminal, specialized software programs, radio transmitters, and telephones. Requires the ability to exercise independent judgment in assigning work crews to handle repairs. Involves constant contact with crews and staff to provide information or to reassign crews. Requires the ability to communicate with the public on sewer repair requests or complaints, plus utilities, private contractors, and plumbers regarding sewer repairs where tactfulness and persuasiveness is required. May occasionally operate sewer locator tools when locating sewer lines.

TYPICAL WORKING CONDITIONS: Work is performed in an office environment, and may occasionally be required to visit work sites to locate sewer lines.

MINIMUM QUALIFICATIONS: High School education and six years experience in planning and scheduling job projects, recordkeeping, and dealing with the public with two of the six years experience in working with computers preferred, or any combination of experience and training which enables one to perform the essential job functions.

Rhoda H. Gillespie /RZB
Written By:

5-7-93
Date:

[signature]
O Review:

5-7-93
Date:

REVIEWED FOR ADA RZB

JOB TITLE:	Sewer Lift Stations Maintenance Manager	JCC#:	F102LS
DIVISION:	Public Works	DATE:	04-22-98
SERVICE CTR:	Lift Stations		
FLSA:	Exempt		

ESSENTIAL JOB FUNCTIONS: Works under the direction of the Administrator of Wastewater Collection Systems. Plans and directs the maintenance of Flood Control Pumping Stations and Sewer Lift Stations. Trains, directs, and evaluates the performance of maintenance personnel in adherence to following proper operation and maintenance procedures; develops and implements maintenance procedures, including a preventive maintenance program; inspects pump stations and equipment for malfunctions and needed repairs; oversees the installation and testing of new or rebuilt equipment and the inspection of contracted maintenance work; ensures that proper records of maintenance, preventative maintenance and equipment manuals, etc. are maintained; prepares contracts, evaluates bids, and prepares the budget for flood control and sewer lift maintenance; and coordinates maintenance work with the operating personnel. Utilizes various PC programs to generate reports, inventory lists, and correspondence..

OTHER FUNCTIONS:

1. Performs additional functions (essential or otherwise) which may be assigned from time to time.

TYPICAL PHYSICAL DEMANDS: Requires the ability to operate a personal computer. Requires the ability to perform routine inspections of the facilities which involves climbing/descending on ladders. May have to assist with manual labor during emergency situations. Requires the ability to operate an automobile to drive to various City facilities for inspections and offices for meetings.

TYPICAL WORKING CONDITIONS: Majority of work is performed in an office environment, but must make inspections of facility which requires being outdoors. May be exposed to various weather conditions, fumes, odors, dust, and noise. May be required to be on-call, twenty-four (24) hours a day, seven (7) days a week for emergencies.

MINIMUM QUALIFICATIONS: High school diploma and seven (7) years experience in the field of mechanical engineering with three (3) of the seven (7) years in a supervisory capacity; or any combination of experience or training which enables one to perform the essential job functions. Must have a valid Tennessee driver's license.

SPECIAL REQUIREMENTS: Must successfully pass written examination and obtain State of Tennessee Wastewater Collection License (grade II) within twenty-four (24) months of employment as a condition of continued employment.

****

Donnie Nelson 4-23-98
WRITTEN BY: DATE:

REVIEWED FOR ADA: RZB 4-23-98

5/7/98
EEO REVIEW: DATE:

5/6/98
DIVISION APPROVAL: DATE:

JOB TITLE: Dispatcher
DIVISION: Public Works
SERVICE CENTER: Environmental Inspection
FLSA: Non-exempt

JCC#: F264DP
DATE: 12-8-93

ESSENTIAL JOB FUNCTIONS: Works under the general supervision of an assigned supervisor in the Environmental Inspection area of the Public Works Division. Receives and processes citizen complaints and requests regarding sewer maintenance needs: Answers telephone and obtains necessary information; relays information to crew assigned to area in which problem occurs, using two-way radio; inputs and retrieves complaint/request information such as time, location, nature of call and action taken, maintains follow up status, and generates reports based on data; and refers non-sewer maintenance calls to appropriate department or agency.

OTHER FUNCTIONS:

1. Performs additional functions (essential or otherwise) which may be assigned from time to time.

TYPICAL PHYSICAL DEMANDS: Requires the ability to operate personal computer, telephone and two-way radio. Must be able to communicate with the public and staff.

TYPICAL WORKING CONDITIONS: Work is performed in an office environment and involves contact with citizens and staff.

MINIMUM QUALIFICATIONS: High school graduation and four (4) years clerical experience; or any combination of experience and training which enables one to perform the essential job functions. One (1) year experience and/or education in operating personal computers with some experience in operating two-way radio preferred.

****

Mary Dennison
WRITTEN BY:

12-9-93
DATE:

EEO REVIEW:

12-9-93
DATE:

REVIEWED FOR ADA: RZB 12/9/93

Appendix B

Collection System Information Checklist

JOB TITLE: Stationary Engineer
DIVISION: Public Works
BUREAU:
FLSA: Non-exempt

CCC#: [illegible]
DATE: 1-29-93

JOB SUMMARY: Works under the direction of an assigned supervisor at the pumping stations in the Public Works Division. Performs more complex task in operating, maintaining, and repairing stationary and mechanical equipment used in and around a flood control pumping station and sewer lift station: Reads and monitors meters and gages to verify operating conditions; adjusts manual controls or overrides automatic controls to regulate equipment according to water levels and prescribed operating ranges; directs crew in the technical maintenance and repair of equipment such as air compressors, pumps, motors, valves, fork lifts, etc.; fabricates equipment and parts using a variety of welding equipment; inspects equipment to detect malfunctions and to perform preventative maintenance; examines and repairs flood walls and levees by repairing and rebuilding broken and weakened sections; and interprets blueprints and operation manuals to determine location, size and type of parts. Operates with appreciable latitude for unreviewed action or decision.

OTHER FUNCTIONS:

1. Performs additional functions (essential or otherwise) which may be assigned from time to time.

TYPICAL PHYSICAL DEMANDS: Must be able to read blueprints and manufacturer's manuals. Requires visual and physical inspections of mechanical systems, and have ability to detect unusual characteristics. Requires walking and the ability to climb ladders and stairs. Requires heavy lifting (approx. 100 lbs.), stooping, balancing, crouching and reaching.

TYPICAL WORKING CONDITIONS: Majority of work is performed in a machine shop environment. Some work is performed outdoors. May be exposed to dust, noise, high voltages, confined spaces, and hot and cold temperatures.

MINIMUM QUALIFICATIONS: High school graduate or equivalent and five (5) years experience in industrial plant maintenance or similar work; or any combination of experience and training which enables one to perform job functions. Some supervisory experience preferred.

****

Mary Dennison
WRITTEN BY:

1-29-93
DATE:

EEO REVIEW

1-29-93
DATE:

REVIEWED FOR ADA 1/29/93

Information Checklist

Circle One

Y N Received SSO call into Dispatch.

Logged information into IMS

- ☐ Time and Date of Call ____ \ ____ \ 20____ AM / PM
- ☐ Name of Caller ____
- ☐ Caller Contact Information ____
- ☐ Location of SSO ____
- ☐ Description of SSO ____
- ☐ Additional Observations ____
- ☐ Additional Information ____

Y N Dispatched Crew ____ \ ____ \ 20____ AM / PM

Crew Names: ____

Y N Crew Confirmed SSO ____ \ ____ \ 20____ AM / PM

Circle One: **City SSO** **Private Property/Building Backup SSO**

Confirmed/Actual SSO Location: ____

Y N Pictures Collected

Y N Hazardous Substances Suspected Present

Y N Establish Control Zone (Public Property)

Y N Appropriate Resources Identified and Dispatched

Y N SSO Stopped ____ \ ____ \ 20____ AM / PM

Methods: ____

____

Estimated Duration of SSO ____

Y N Flow Diversion Type ____

Y N SSO Clean-Up

Method of Clean-Up

☐ Manual Practices ☐ Mechanical Practices ☐ Disinfection Practices

Explain: ____

____

Y N Public Information Type: ____

Y N Water Quality Monitoring Required

Y N Stream Affiliation Name: ____

Y N Affected Human Contact Areas Name: ____

Y N Observable Follow-Up Action

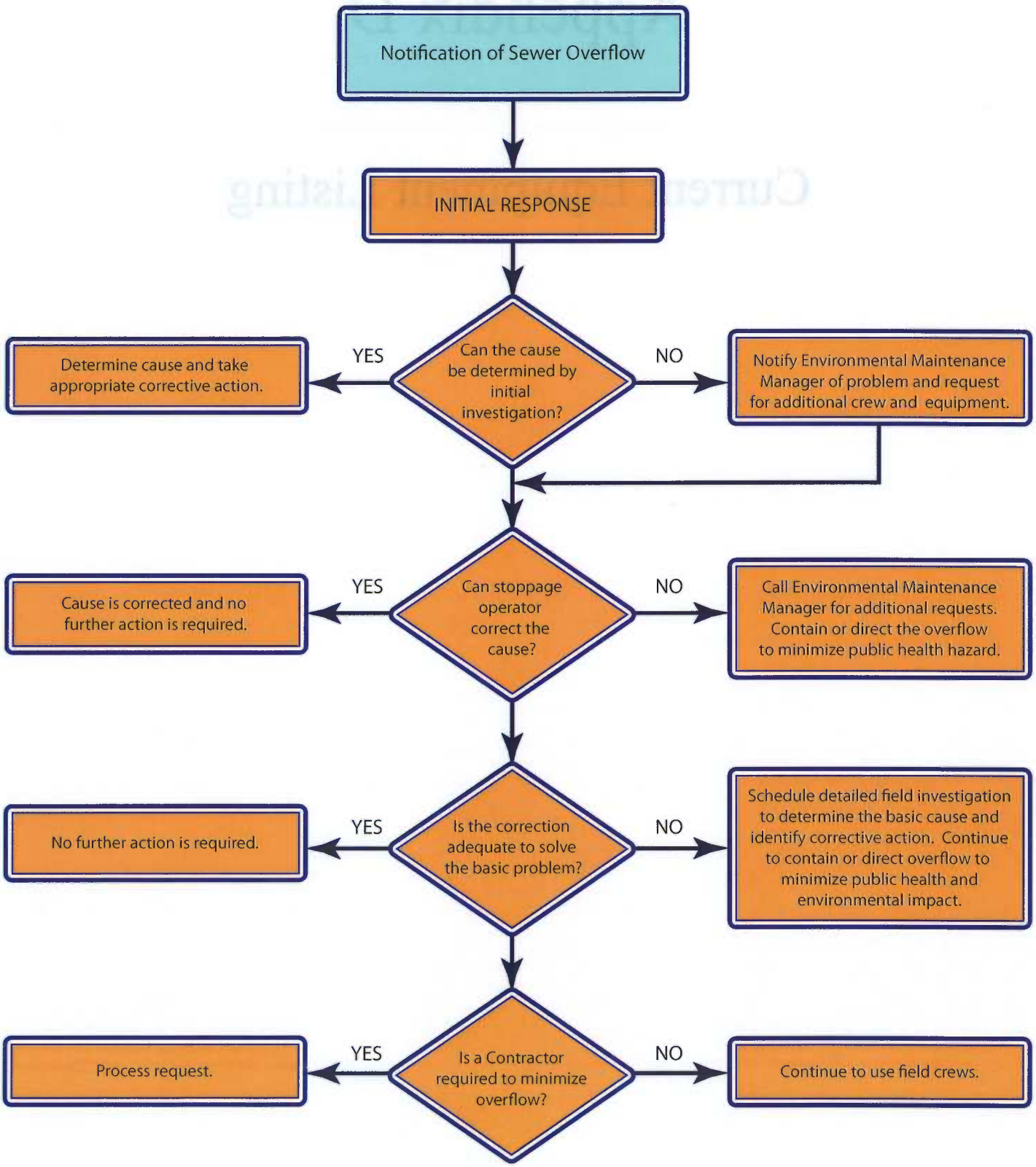
Type: ____

____

Use Back of Sheet for Additional Comments

Appendix C

Initial Response Flow Chart


Notification of Sewer Overflow
INITIAL RESPONSE
Can the cause be determined by initial investigation?
YES
Determine cause and take appropriate corrective action.
NO
Notify Environmental Maintenance Manager of problem and request for additional crew and equipment.
Can stoppage operator correct the cause?
YES
Cause is corrected and no further action is required.
NO
Call Environmental Maintenance Manager for additional requests. Contain or direct the overflow to minimize public health hazard.
Is the correction adequate to solve the basic problem?
YES
No further action is required.
NO
Schedule detailed field investigation to determine the basic cause and identify corrective action. Continue to contain or direct overflow to minimize public health and environmental impact.
Is a Contractor required to minimize overflow?
YES
Process request.
NO
Continue to use field crews.

Appendix D

Current Equipment Listing

EQUIPMENT RESOURCES

EQUIP DESCRIPTION.	MAKE/MODEL	QUANTITY
SEWER INSPECTION/STOPPAGE		
CCTV TRUCKS	CUES	2
EASEMENT MACHINES	FORD/SCRUGGS	2
JET RODDER	VACTOR	1
WASH TRUCKS	VACTOR	6
COMBINATION JET/VACUUM	VACTOR	2
CABLE TRUCKS	GMC	2
VACTOR TRUCK	VACTOR	1
SEWER REPAIR		
CREW CAB TRUCKS	INTERNATIONAL/FREIGHTLINER	7
TANDEM DUMPS	INTERNATIONAL/FREIGHTLINER	13
BACKHOES	CASE/HYNDUI/FORD/DEERE	7
PORTABLE AIR COMPRESSSOR	INGERSOL/SULLAIR	6
HYDRAULIC EXCAVATORS	CAT/ HYUNDAI	2
LOADERS	CAT/ HYUNDAI	2
PICK UP TRUCKS	FORD/DODGE/GMC	22
SUPPORT SERVICES		
REPAIR/MAINTENANCE TRUCKS	MAINTANIER/FORD/	2
CRANE TRUCK	MAINTAINER	1
SEWER BUCKET MACHINES	SRECO	2
TRUCK/TRACTOR W/LOWBOY	INTERNATIONAL	2
TRUCK/TRAILER	INTERNATIONAL/INTERSTATE	1

EQUIPMENT RESOURCES

EQUIP DESCRIPTION.	MAKE/MODEL	QUANTITY
SEWER INSPECTION/STOPPAGE		
CCTV TRUCKS	CUES	2
EASEMENT MACHINES	FORD/SCRUGGS	2
JET RODDER	VACTOR	1
WASH TRUCKS	VACTOR	6
COMBINATION JET/VACUUM	VACTOR	2
CABLE TRUCKS	GMC	2
VACTOR TRUCK	VACTOR	1
SEWER REPAIR		
CREW CAB TRUCKS	INTERNATIONAL/FREIGHTLINER	7
TANDEM DUMPS	INTERNATIONAL/FREIGHTLINER	13
BACKHOES	CASE/HYNDUI/FORD/DEERE	7
PORTABLE AIR COMPRESSSOR	INGERSOL/SULLAIR	6
HYDRAULIC EXCAVATORS	CAT/ HYUNDAI	2
LOADERS	CAT/ HYUNDAI	2
PICK UP TRUCKS	FORD/DODGE/GMC	22
SUPPORT SERVICES		
REPAIR/MAINTENANCE TRUCKS	MAINTANIER/FORD/	2
CRANE TRUCK	MAINTAINER	1
SEWER BUCKET MACHINES	SRECO	2
TRUCK/TRACTOR W/LOWBOY	INTERNATIONAL	2
TRUCK/TRAILER	INTERNATIONAL/INTERSTATE	1

LIFT STATION INVENTORY

PORTABLE PUMPS

FOUR (4)	-	12" DRI PRIME
TWO (2)	-	8" DRI PRIME
TWO (2)	-	6" DRI PRIME
TWO (2)	-	4" HYDRAULIC
ONE (1)	-	6" HYDRAULIC

PORTABLE GENERATORS

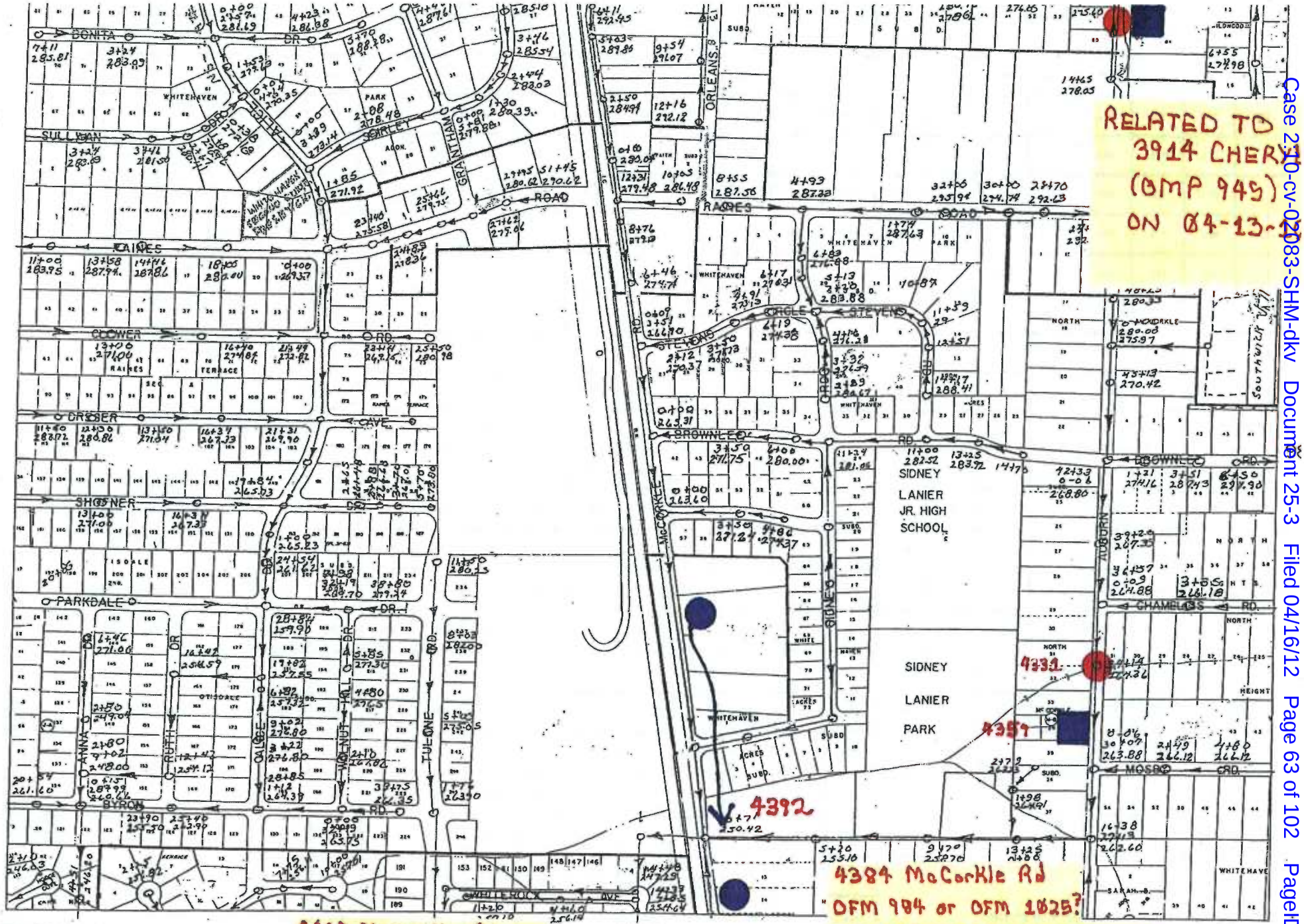
ONE (1)	-	125 KW SKID MOUNTED
ONE (1)	-	125 KW TRAILER MOUNTED

STATIONARY GENERATORS

ONE (1)	-	350 KW @ 1525 KIMBROUGH
ONE (1)	-	600 KW @ 2820 HARBOR

Appendix E

SSO Maps



KEY

mber of Overflows
ıll Map Page Number
riority SMHI OFM

5 - 9 Overflows

10 - 19 Overflows

20 - 29 Overflows

30 - 39 Overflows

0 - 49 Overflows

BARTLETT, GERMANTOWN, & LAKELAND (APPROXIMATE AREAS)

) Boundary of Outfall Map May Be Listed for More

oread Overflows during 1 Extremely Heavy Rainfall
ermits, Counted as 2 Overflows (1 Each per Permit).
ws are Not Shown on Map,

Note: Possible misnumbering of Pages - Field inspections indicate th[illegible] P
north and south of each other, not Pages 317 & 338 or Pages 318 &

					309	310	311	312	313	314	315	316	317	318	319	320							
					330	331	332	333	334	335 1	336	337	338 1	339	340	341							
					351	352	353	354	355	356	357	358	359	360	361	362							
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					396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415
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					450	451	452	453	454 P	455 P	456	457	458 P	459	460	461	462	463	464	465	466	467	468	469
					477	478	479 P	480 1 P	481 P	482 1 P	483	484	485 P	486	487	488	489	490	491	492	493	494	495	496
					505	506	507	508 P	509	510	511	512	513	514 P	515	516	517	518	519	520	521	522	523	524
					534	535	536	537	538	539	540	541	542	543	544	545	546	547 P	548	549	550	551	552	553
					563	564	565	566 1	567	568	569	570	571	572	573	574 1 P	575	576	577	578	579	580	581	582
					592	593	594 P	595 P	596	597	598	599	600	601	602	603	604	605 P	606	607	608	609	610	611
					619	620 P	621 P	622	623	624	625 P	626	627	628	629	630	631	632	633	634	635	636	637 1	638
					645	646 P	647	648 P	649	650 P	651 P	652	653 P	654	655	656	657	658	659	660	661	662	663	664
				674	675 1 P	676 1 P	677 1	678	679 2	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694
				707	708 P	709	710	711 P	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726 1	727
			739	740	741 P	742 P	743 P	744 P	745 P	746	747	748	749	750	751	752	753	754 P	755	756	757	758	759	760
		771	772	773	774 1	775	776	777 P	778 1	779	780 P	781 P	782 P	783	784	785 1	786	787	788	789	790	791	792	793
802	803	804	805	806	807	808 P	809	810	811	812	813 1	814	815 P	816	817	818	819	820	821	822	823	824	825	826
835	836	837	838	839	840	841	842	843	844 P	845	846	847	848 P	849	850	851	852	853	854	856	856	857	858	
	869	870	871	872	873	874	875	876	877	878	879	880	881 P	882	883	884 P	885 P	886 1	887 P	888 1	889	890	891	
	903	904	905	906	907	908	909	910	911	912	913	914	915 1 P	916	917 2	918	919 1	920	921	922	923 1	924	925	926
	940	941	942 P	943	944	945 P	946	947	948	949	950	951	952	953	954 P	955 P	956	957	958 1	959	960	961	962 1	963
	979	980	981 1	982	983	984	985	986	987	988	989	990	991	992	993	994	995 P	996	997 1	998	999	1000	1001	
		1																						

KEY

mber of Overflows
ill Map Page Number
riority SMHI OFM

5 - 9 Overflows

10 - 19 Overflows

20 - 29 Overflows

30 - 39 Overflows

0 - 49 Overflows

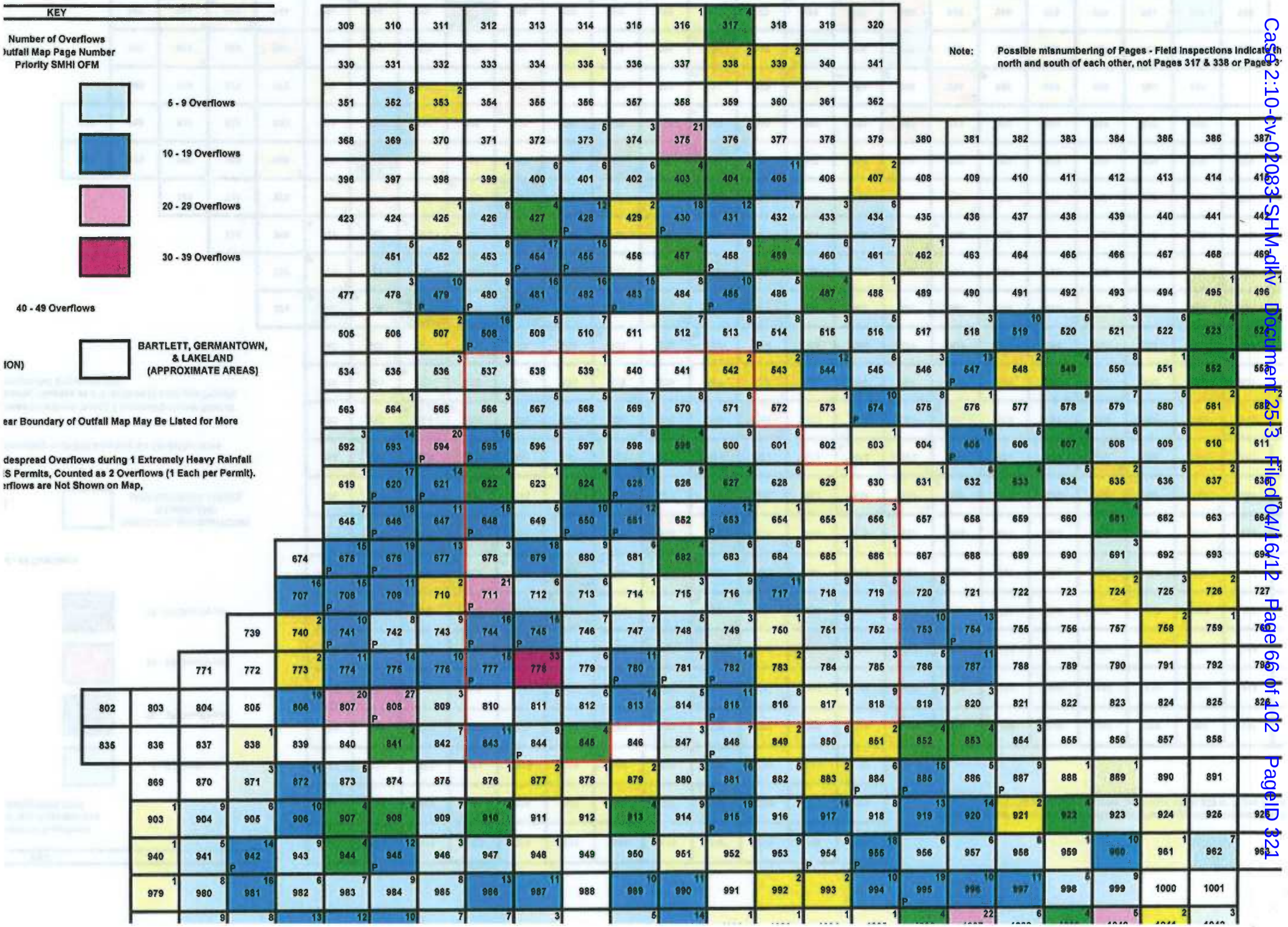
BARTLETT, GERMANTOWN, & LAKELAND (APPROXIMATE AREAS)

)

Boundary of Outfall Map May Be Listed for More

pread Overflows during 1 Extremely Heavy Rainfall
ermits, Counted as 2 Overflows (1 Each per Permit).
ws are Not Shown on Map,

Note: Possible misnumbering of Pages - Field Inspections Indicate that F
north and south of each other, not Pages 317 & 338 or Pages 318 &



Appendix F

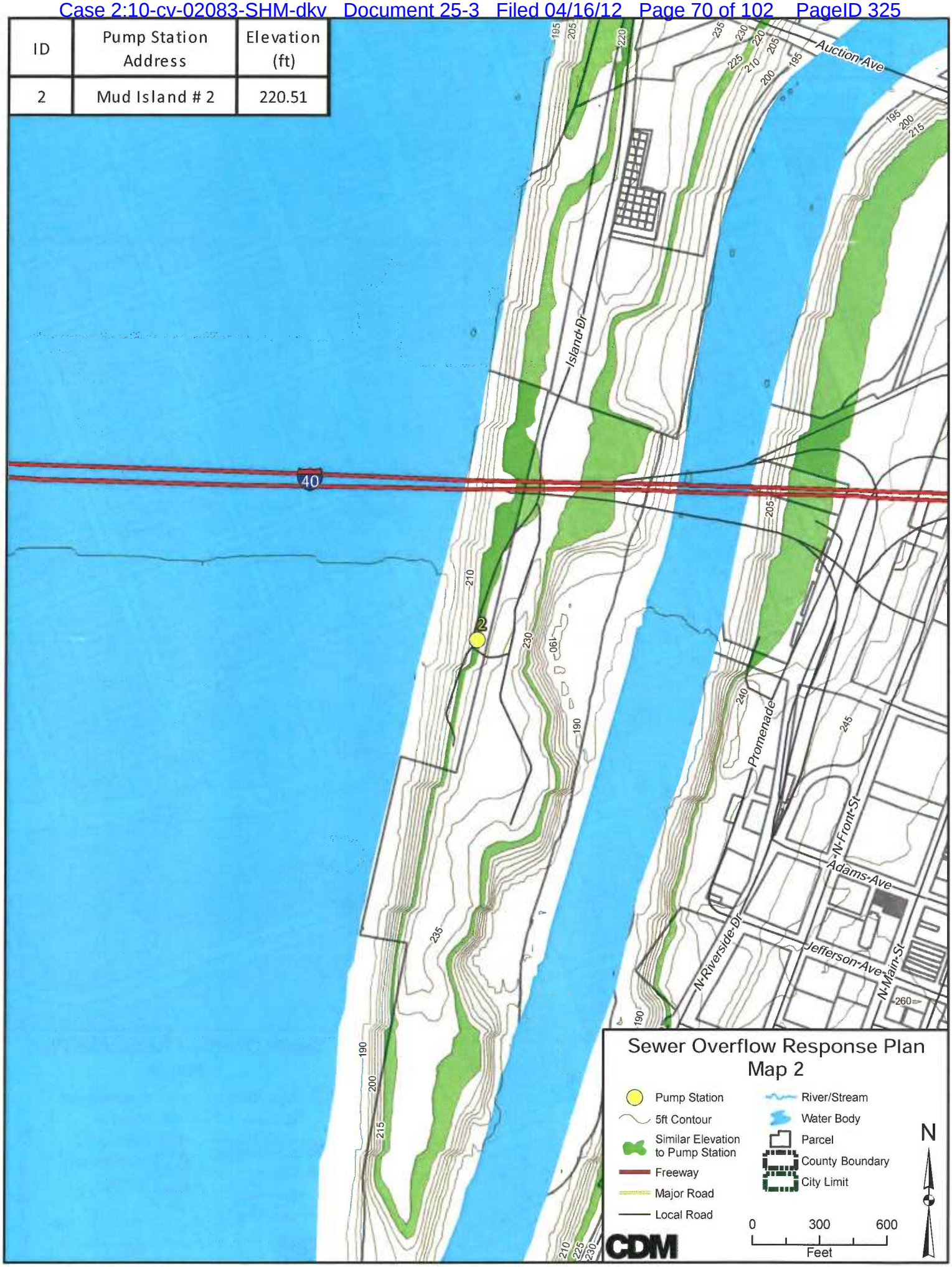
Lift Station Critical Manholes

Appendix F
Lift Station Critical Locations

ID	Address	Elevation	Mapbook Page	Critical Locations
1	380 North Third	223.17	620	North on North 3rd Street to North Parkway
2	Mud Island #2	220.51	619	Island Drive under the I-40 Overpass
3	5230 Raleigh Millington	227.96	359	North Along Raleigh Millington Road to the Intersection of Fite Road Fite Road west of Blue Sky Drive
4	1490 North Bellevue	236.92	565	North on North Bellevue Boulevard to the I-40 Overpass
5	1254 Big Orange	284.17	-	East of Macon Road & Big Orange Road Intersection Intersection of Laurisa Drive & Rocky Hills Drive
6	8709 Rockcreek Parkway	341.65	-	Adjacent to Lift Station on Rockcreek Parkway
7	1525 Kimbrough	266.7	757	Kimbrough Road from Stonewyck Road to Farmingdale Road West of Farmingdale Road to Intersection with Golden-Fields Drive
8	950 Early Maxwell	310.12	713	Intersection of Early Maxwell Boulevard & Kentucky Avenue Intersection of Early Maxwell Boulevard & Mississippi Avenue Intersection of Mississippi Avenue and Alabama Street
9	1324 West Holmes	240.13	1062	Locations West Along Longcrest Road from Lift Station
10	4950 East Shore	235.08	1062	Locations adjecent to Lift Station
11	1474 West Shelby Drive	240.25	1021	Locations Adjacent to Lift Station South on Coro Road Until Sharp Bend to West South on Lakeridge Drive to Intersection of North Drive
12	1585 West Mitchell	256.69	869	Adjacent to Lift Station
13	Riverport #2	214.61	839	Adjacent to Lift Station
14	1043 Wilson	303.31	710	South on Wilson Street to Intersection of McLemore Avenue
15	386 Jack Carley	215.96	707	Adjacent to Lift Station
16	2820 Harbor	223.51	802	Harbor Avenue to End of Line (Approximately 5 Houses Northwest) Harbor Avenue to End of Line (Approximately 10 Houses Southest)
17	35 West Saffarans	234.37	593	North on North Front Street to Keel Avenue South on North Front Street to Auction Avenue
18	1141 North Second	227.81	564	Adjacent to Lift Station
19	4791 Bolen Huse	255.91	360	Adjacent to Lift Station
20	1399 Ridgeway	299.33	786	South Along Ridgeway Road to the Intersection of Quince Road
21	4239 Mendenhall	282.91	994	Adjacent to Lift Station

ID	Pump Station Address	Elevation (ft)
1	380 N Third	223.17

ID	Pump Station Address	Elevation (ft)
2	Mud Island # 2	220.51



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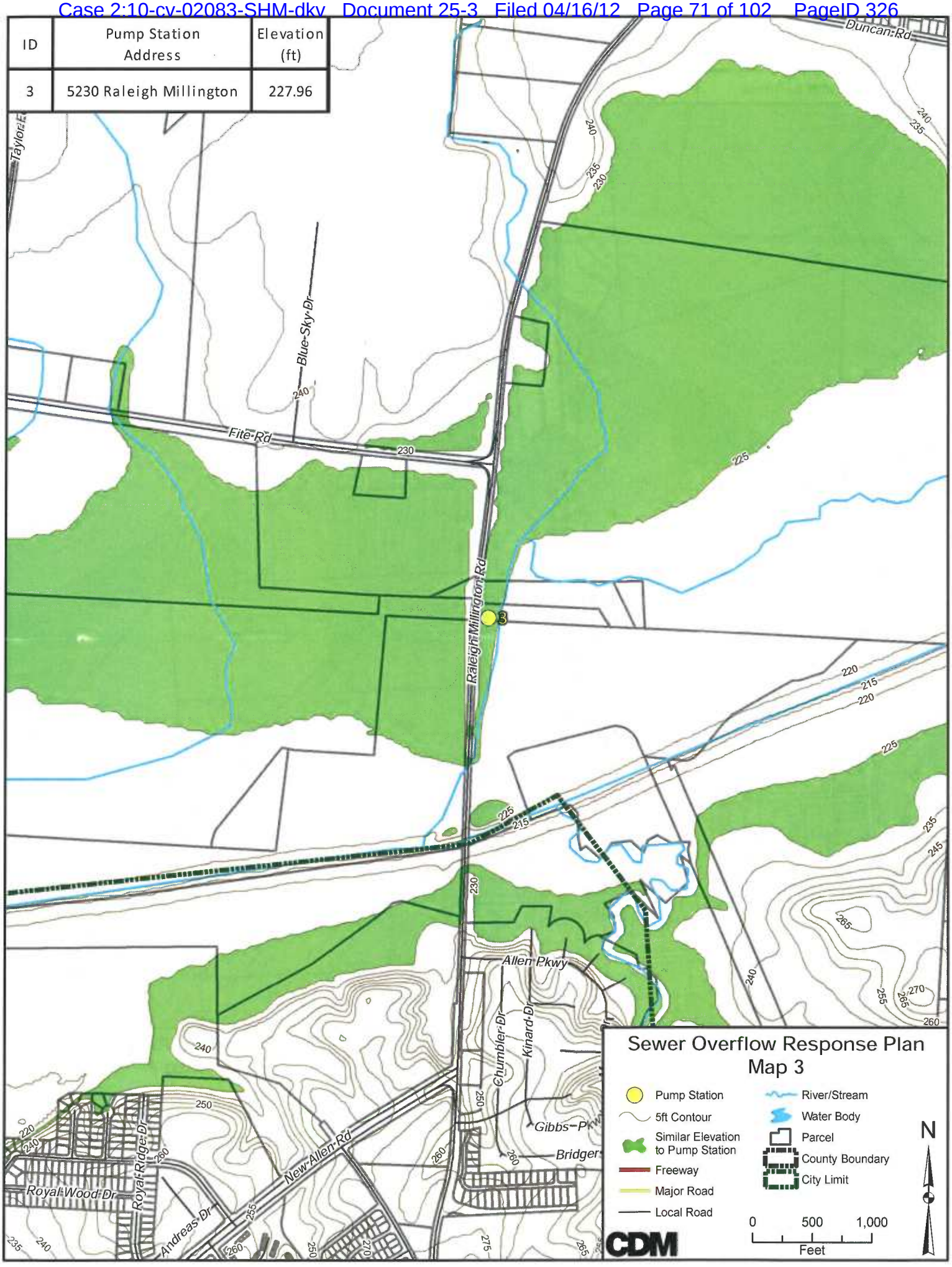
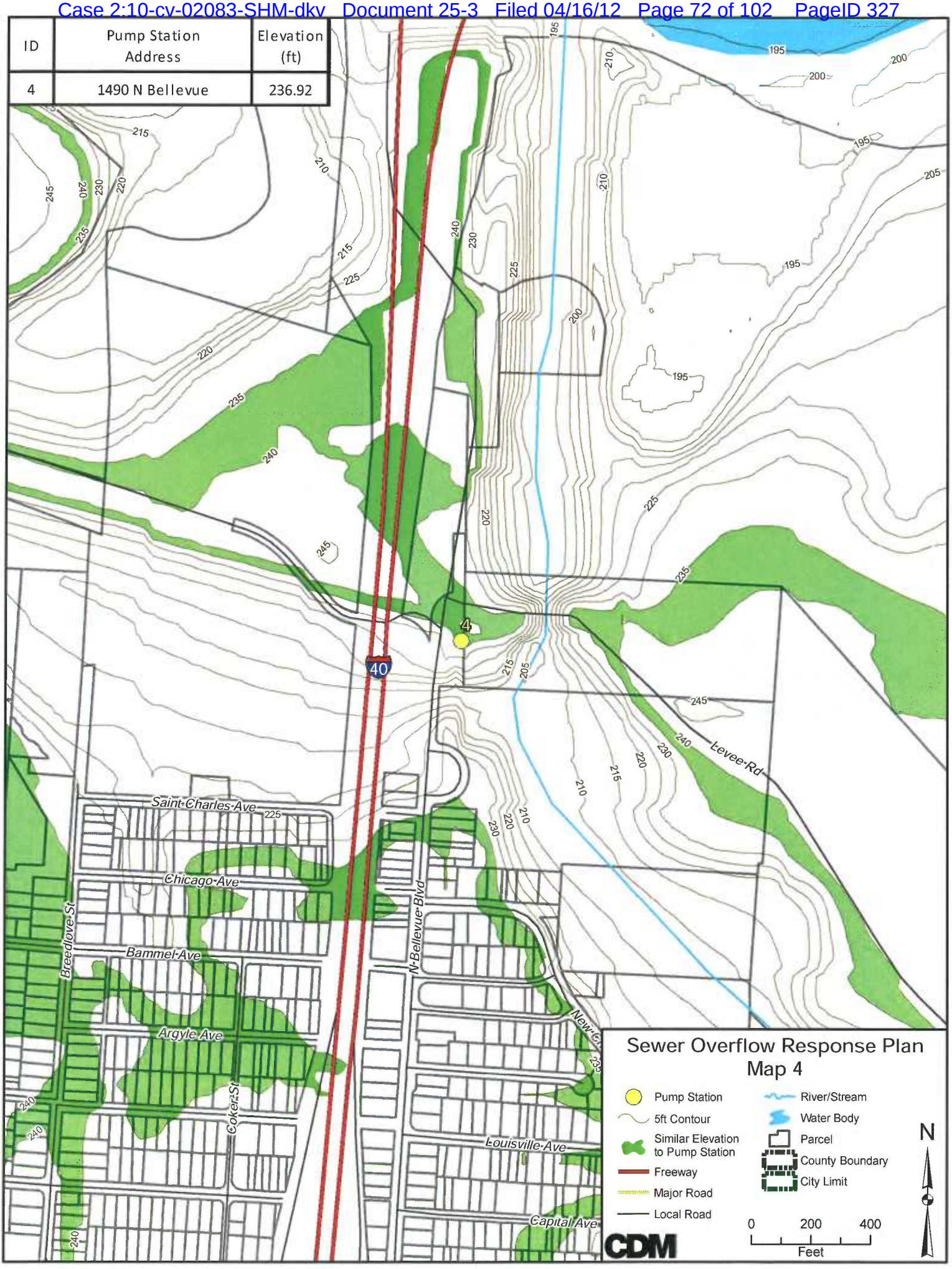
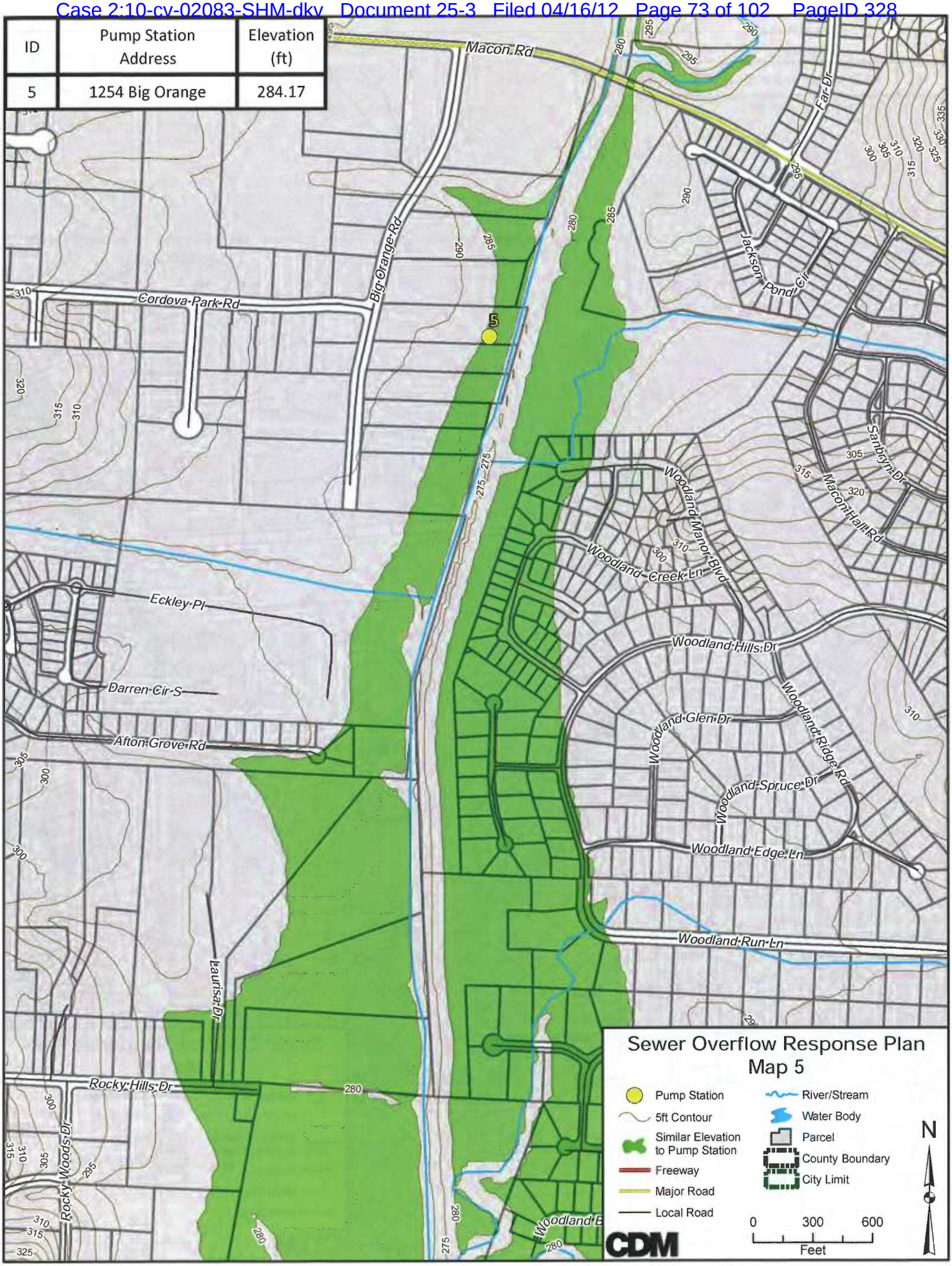
3	5230 Raleigh Millington	227.96



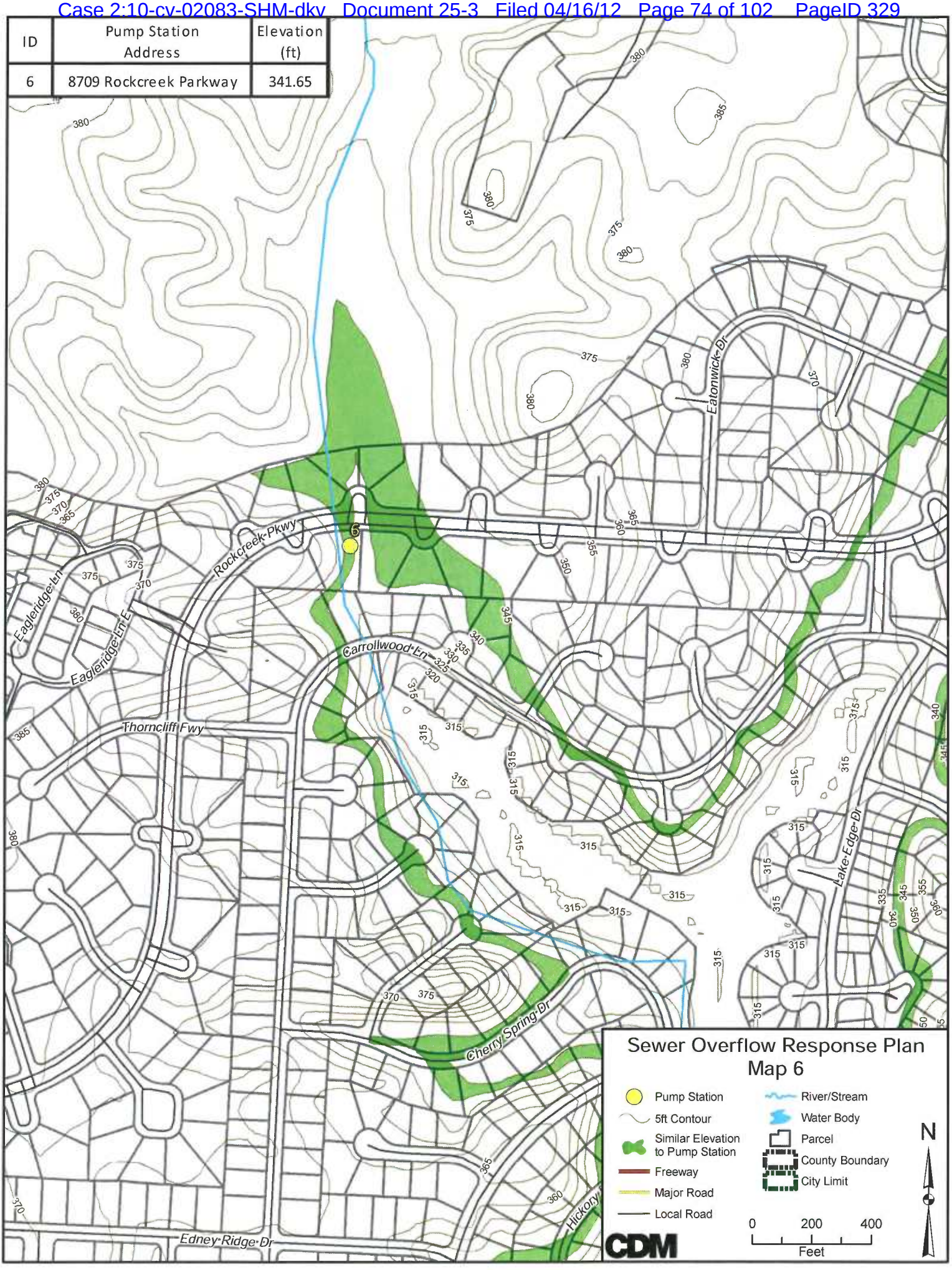
ID	Pump Station Address	Elevation (ft)
4	1490 N Bellevue	236.92

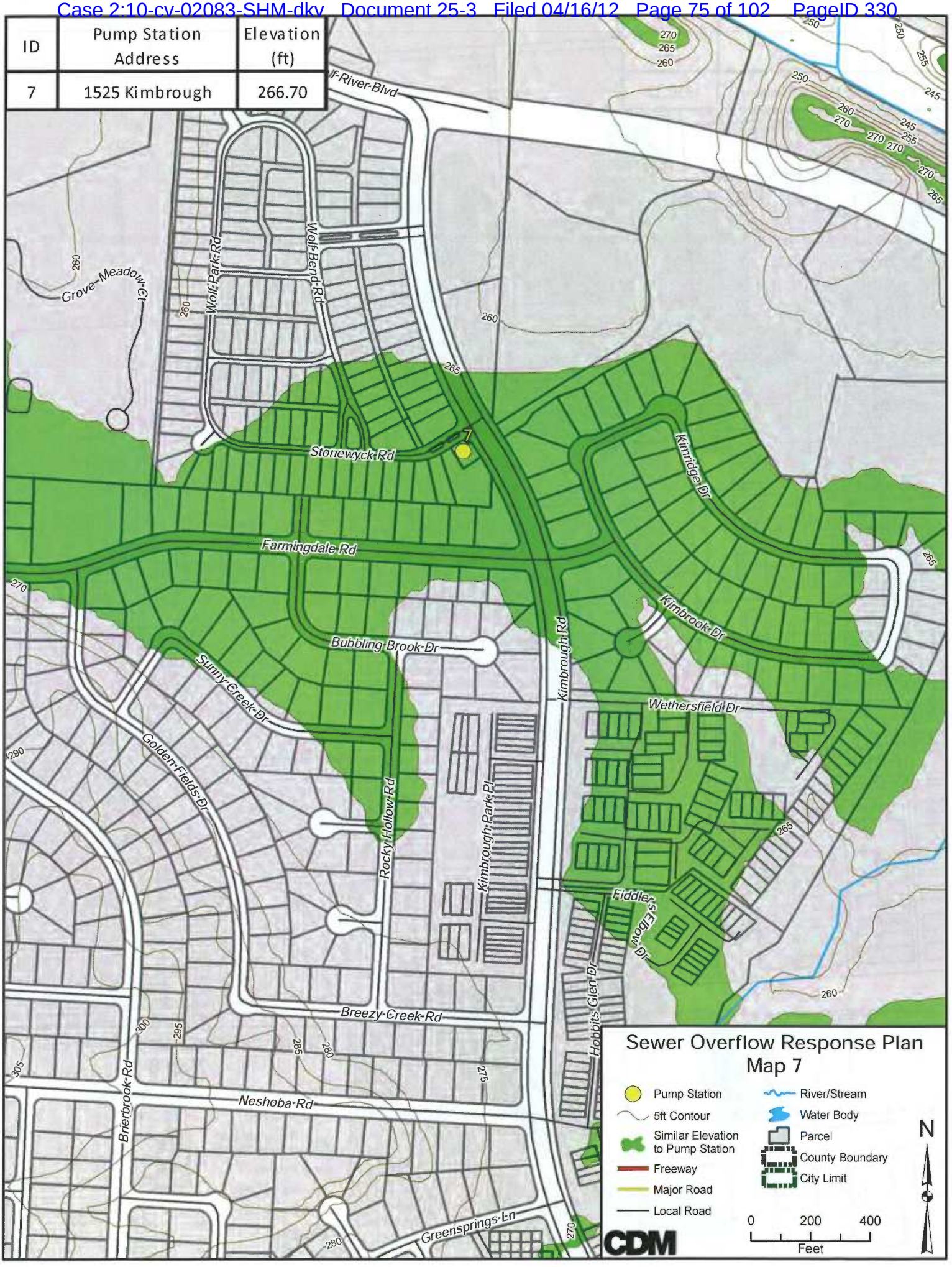


ID	Pump Station Address	Elevation (ft)
5	1254 Big Orange	284.17

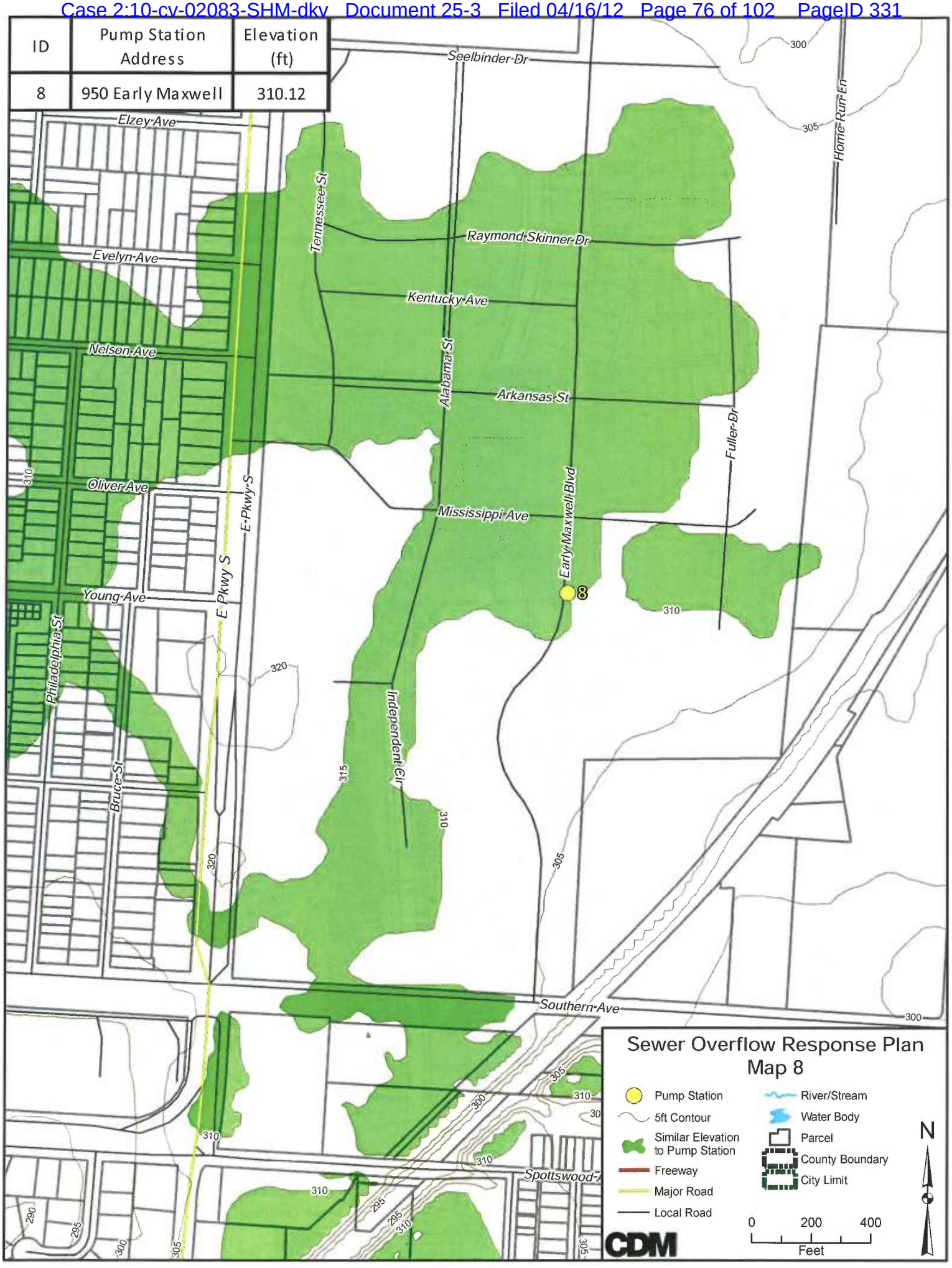


ID	Pump Station Address	Elevation (ft)
6	8709 Rockcreek Parkway	341.65

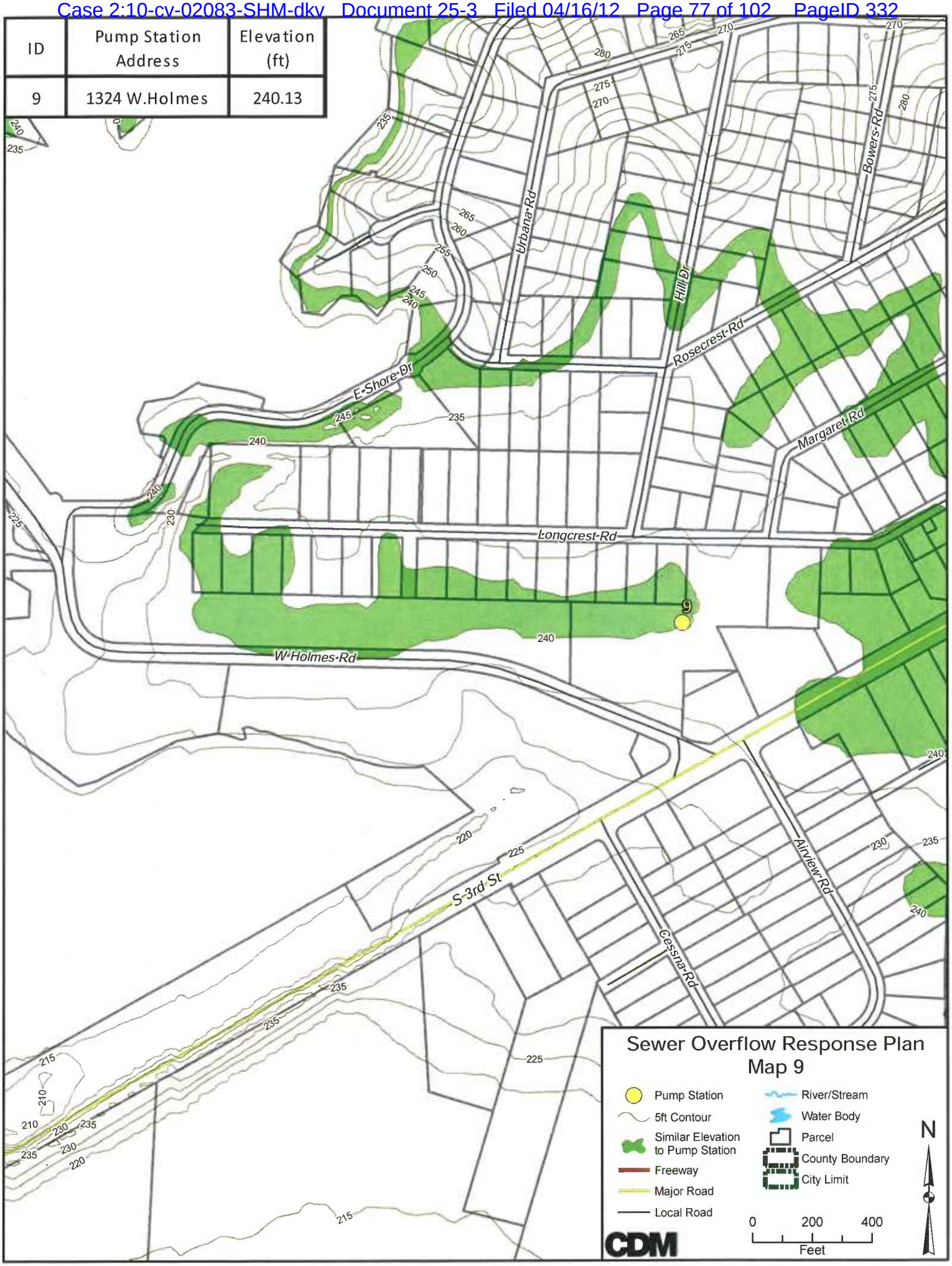



ID
Pump Station Address
Elevation (ft)
7
1525 Kimbrough
266.70
Wolf River Blvd
Grove Meadow Ct
Wolf Park Rd
Wolf Bend Rd
Stonewyck Rd
Kimridge Dr
Farmingdale Rd
Kimbrook Dr
Bubbling Brook Dr
Sunny Creek Dr
Golden Fields Dr
Kimbrough Rd
Wethersfield Dr
Rocky Hollow Rd
Kimbrough Park Pl
Fiddlers Elbow Dr
Hobbits Glen Dr
Breezy Creek Rd
Briertbrook Rd
Neshoba Rd
Greensprings Ln
Sewer Overflow Response Plan
Map 7
Pump Station
5ft Contour
Similar Elevation to Pump Station
Freeway
Major Road
Local Road
River/Stream
Water Body
Parcel
County Boundary
City Limit
N
0
200
400
Feet
CDM

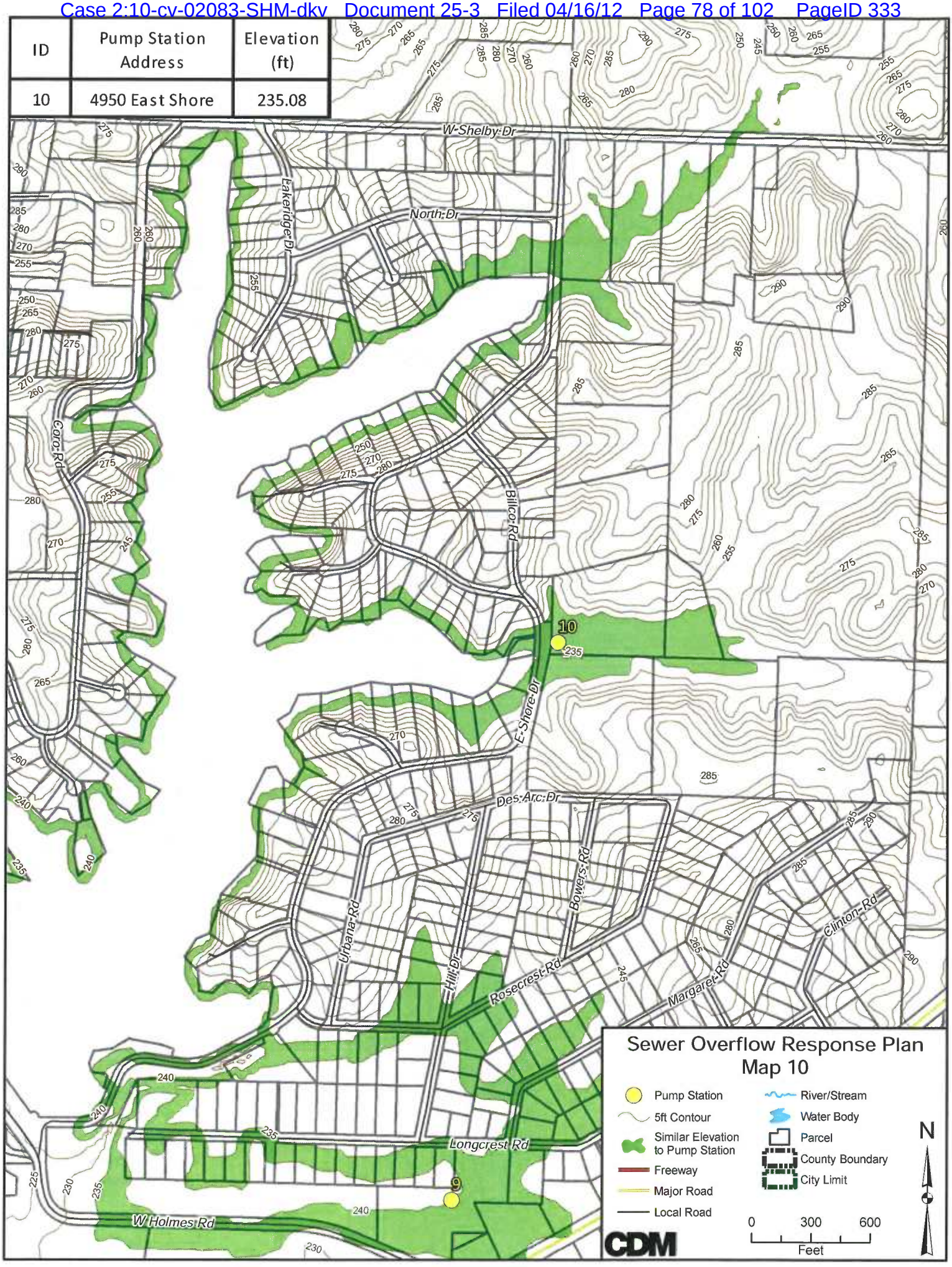
ID	Pump Station Address	Elevation (ft)
8	950 Early Maxwell	310.12



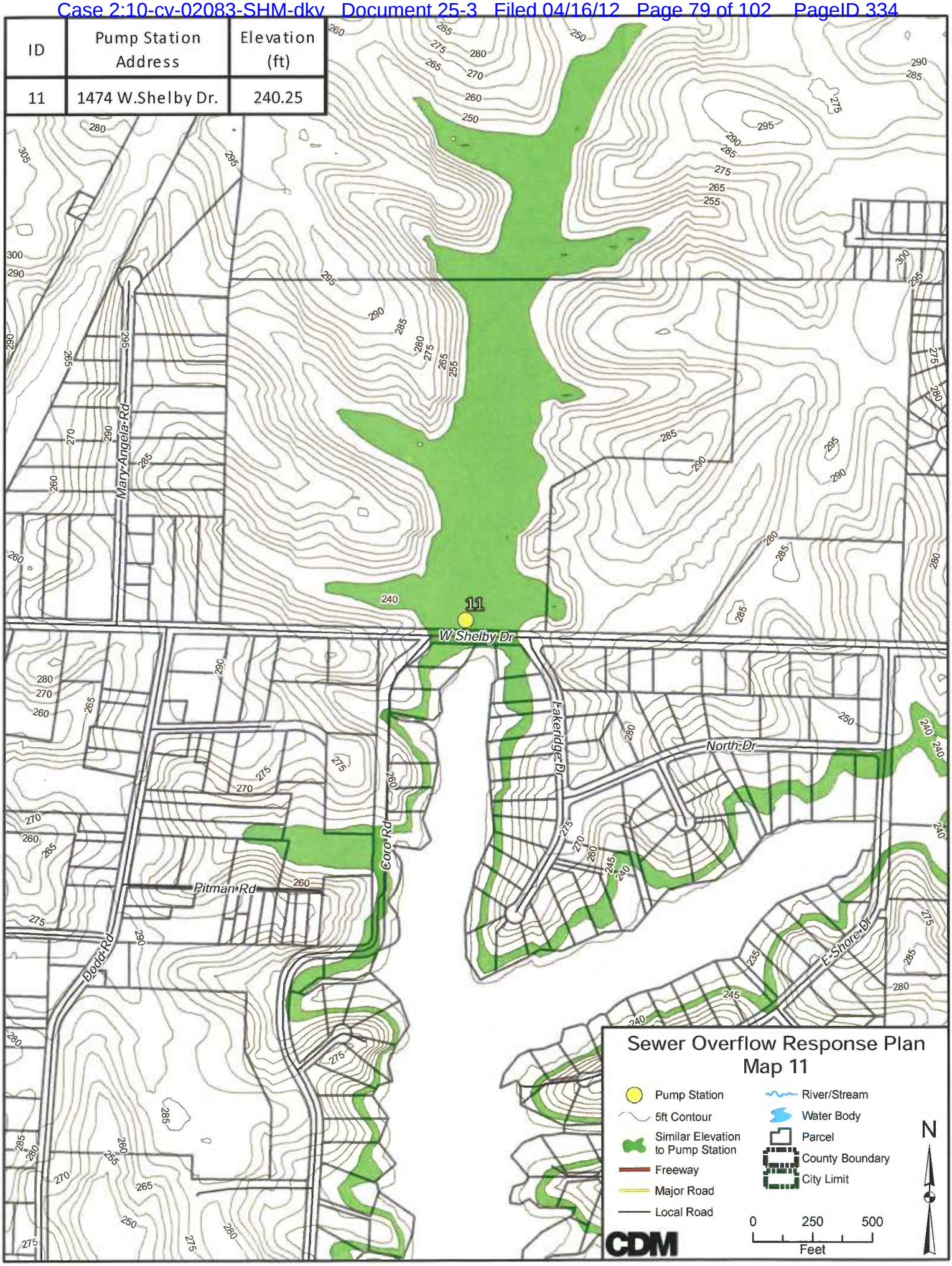
ID	Pump Station Address	Elevation (ft)
9	1324 W.Holmes	240.13



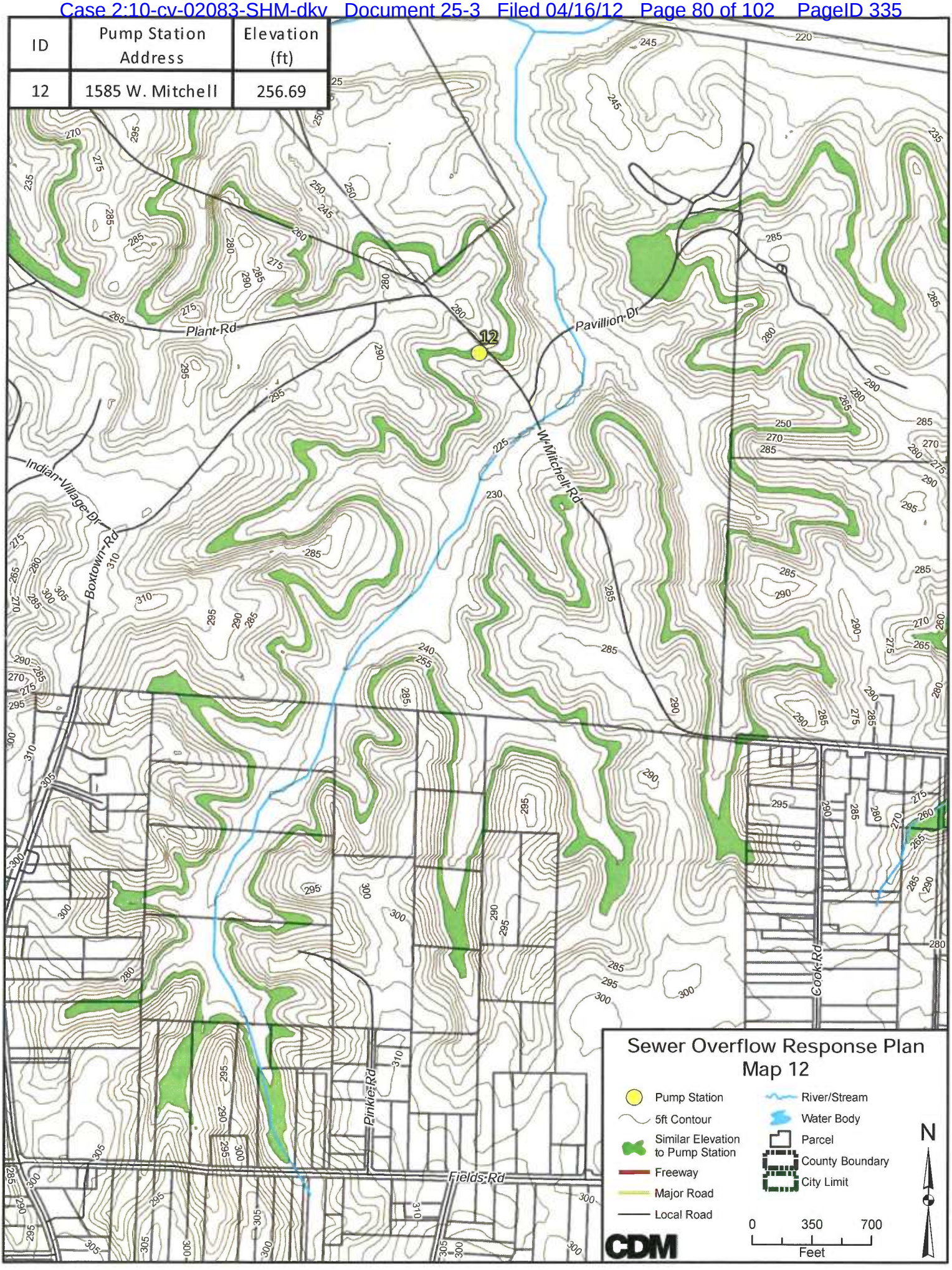
ID	Pump Station Address	Elevation (ft)
10	4950 East Shore	235.08



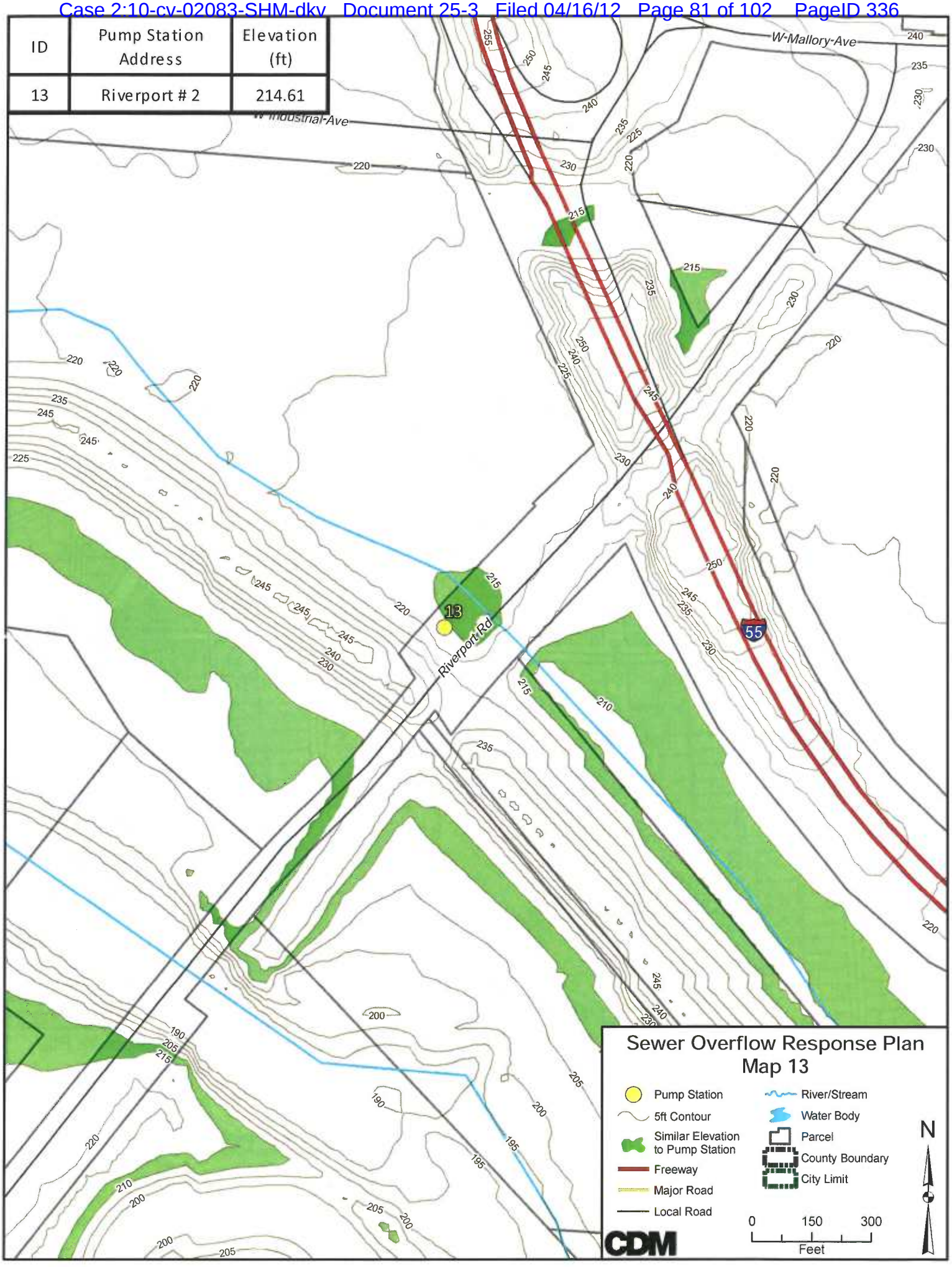
ID	Pump Station Address	Elevation (ft)
11	1474 W.Shelby Dr.	240.25



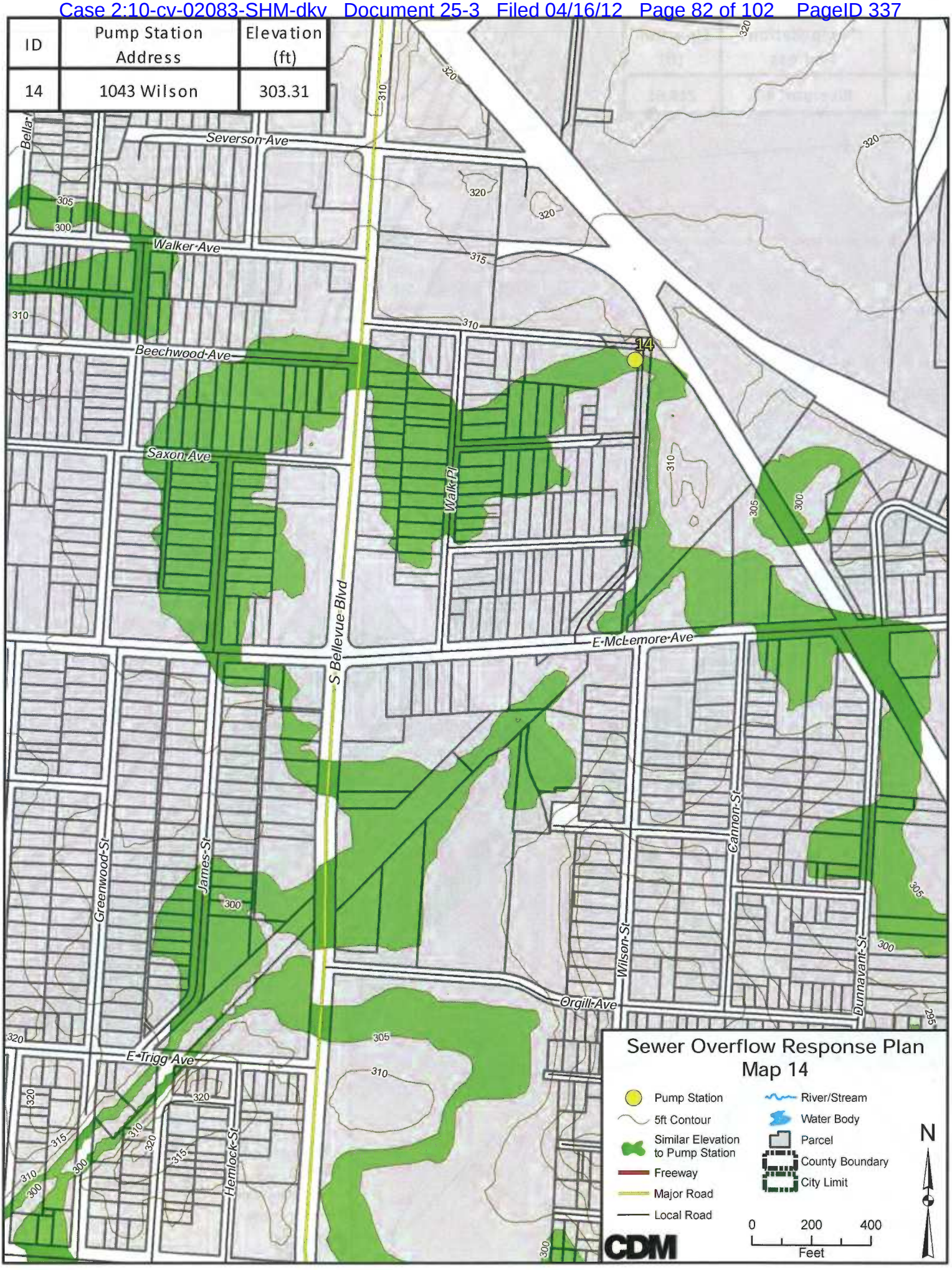
ID	Pump Station Address	Elevation (ft)
12	1585 W. Mitchell	256.69



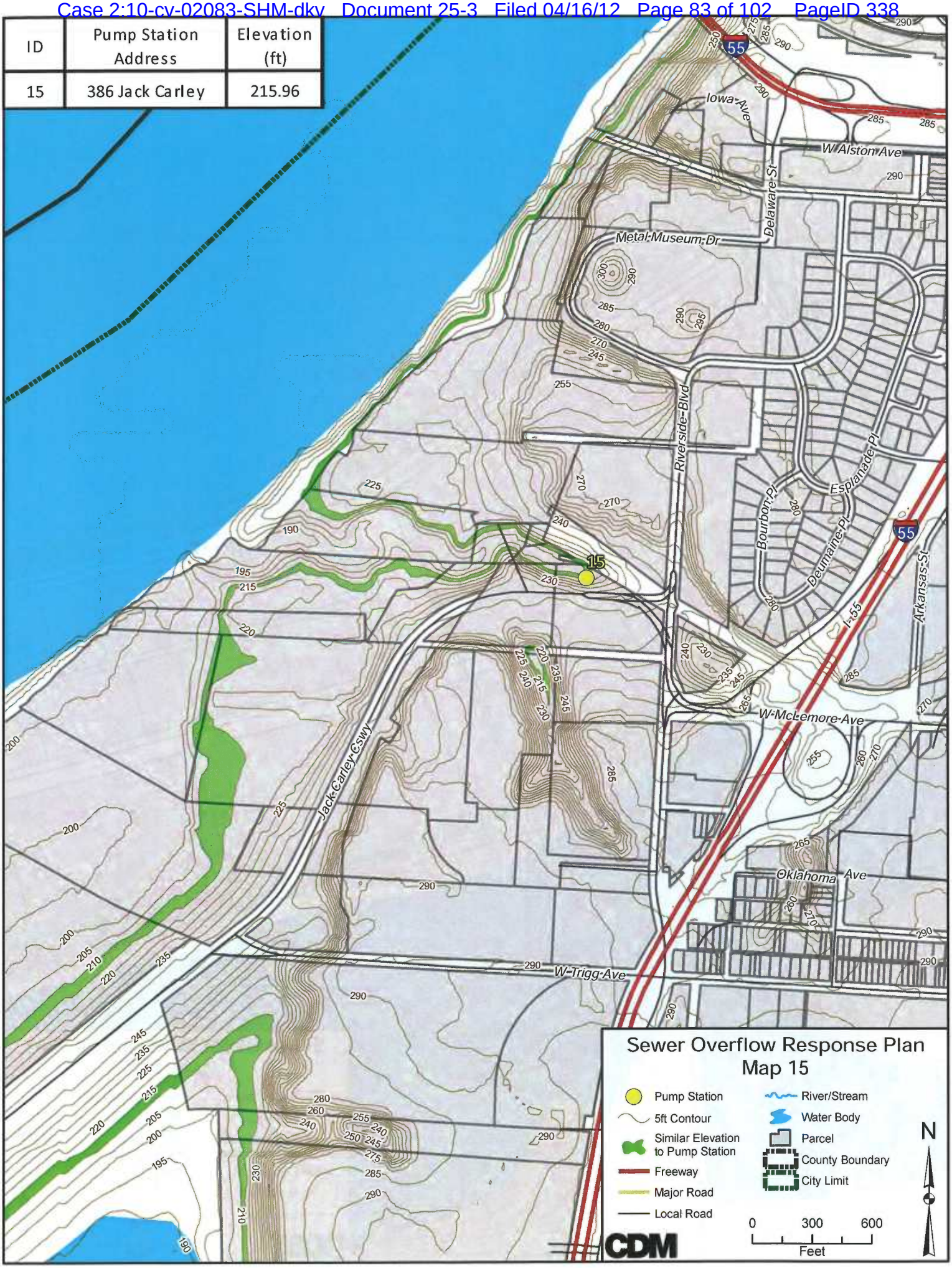
ID	Pump Station Address	Elevation (ft)
13	Riverport # 2	214.61



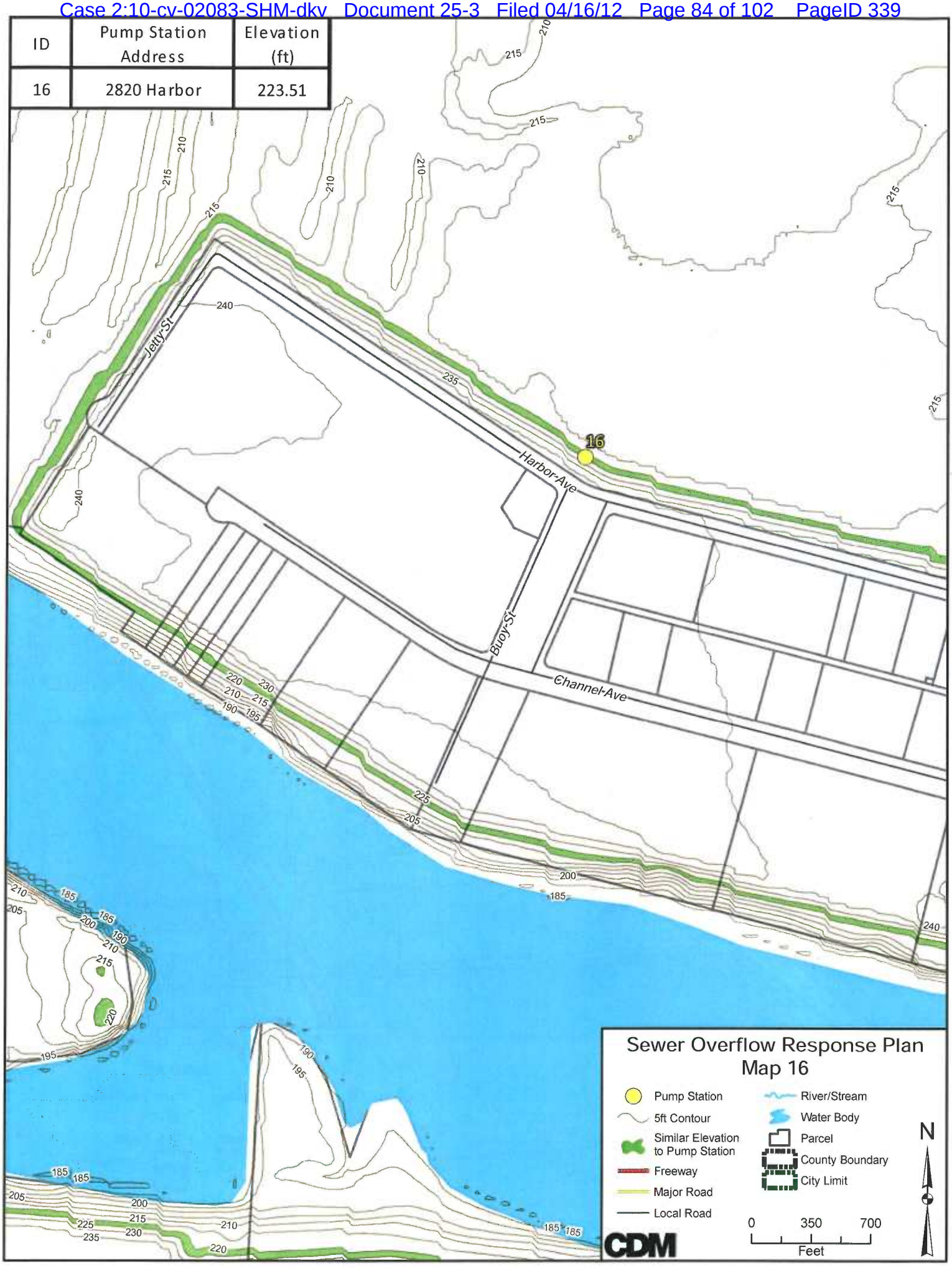
ID	Pump Station Address	Elevation (ft)
14	1043 Wilson	303.31



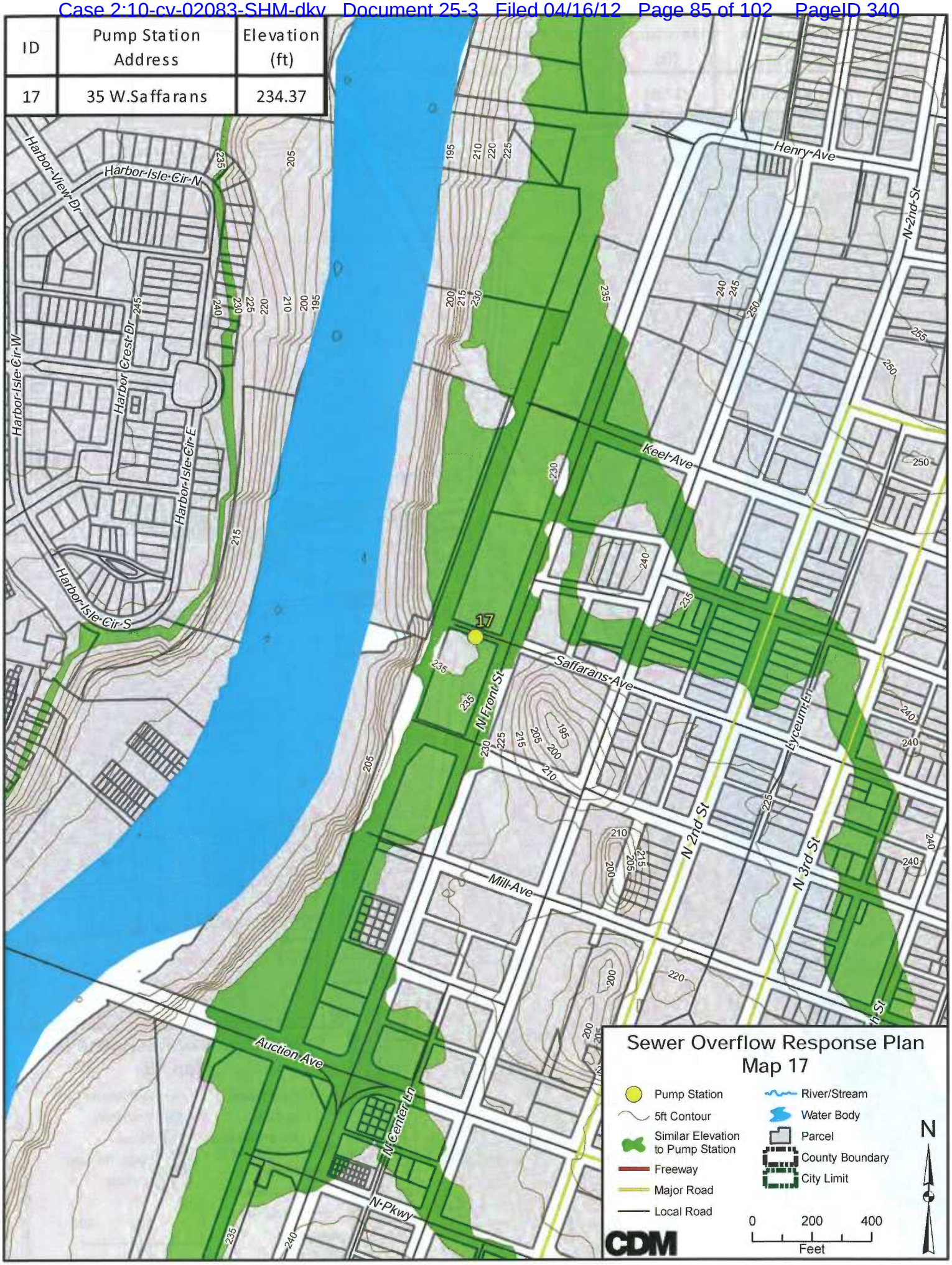
ID	Pump Station Address	Elevation (ft)
15	386 Jack Carley	215.96

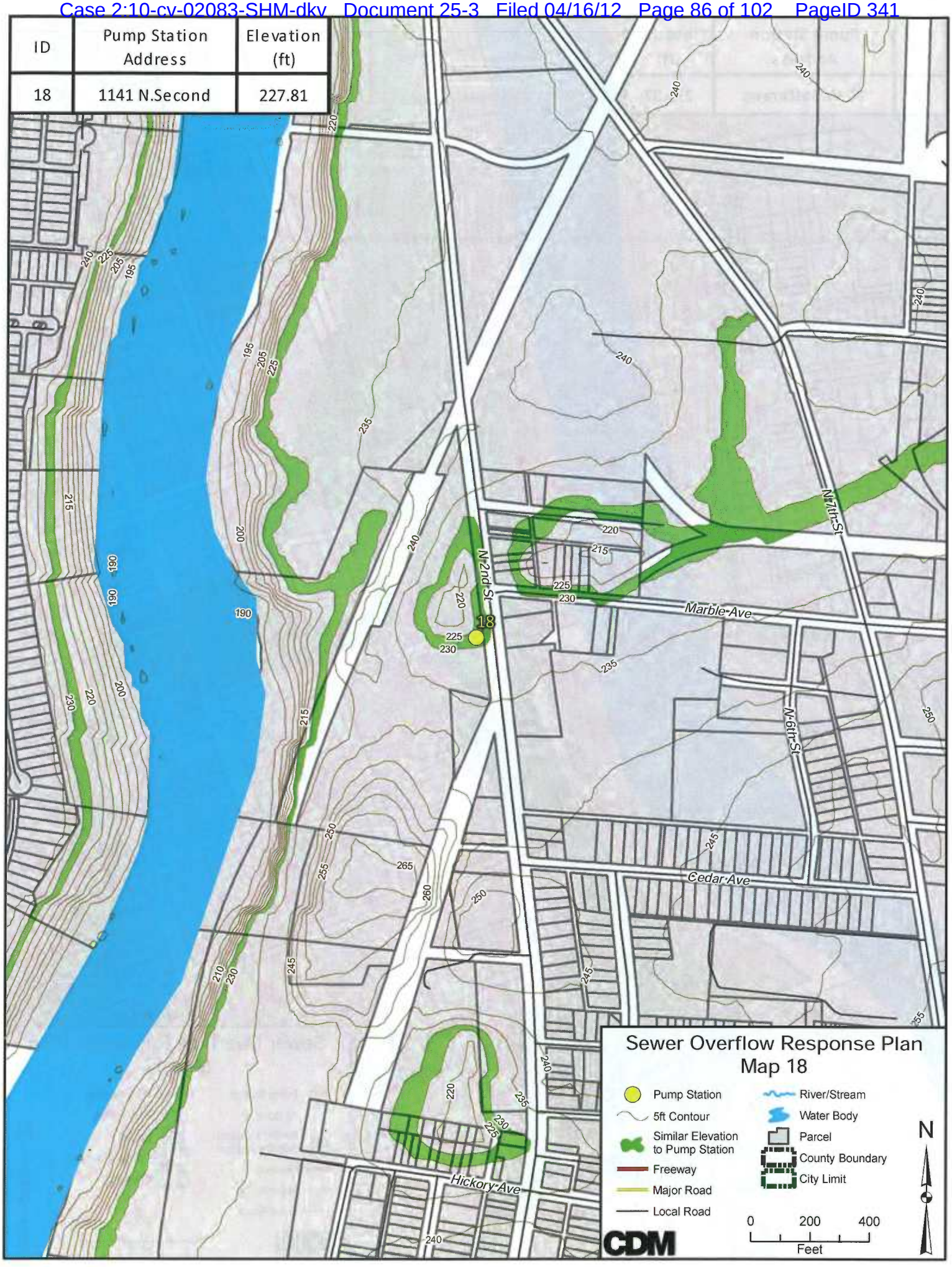


ID	Pump Station Address	Elevation (ft)
16	2820 Harbor	223.51

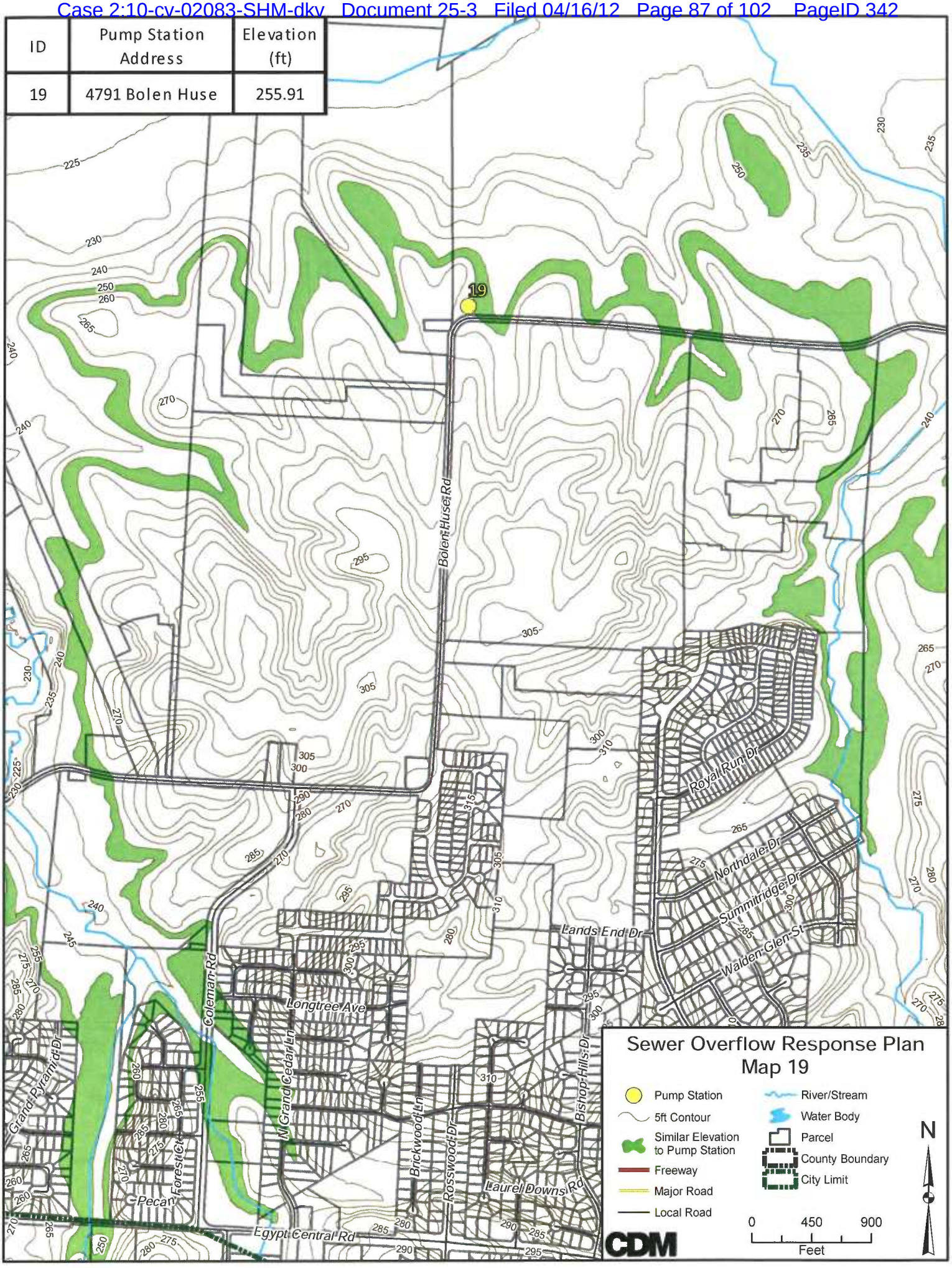


ID	Pump Station Address	Elevation (ft)
17	35 W.Saffarans	234.37

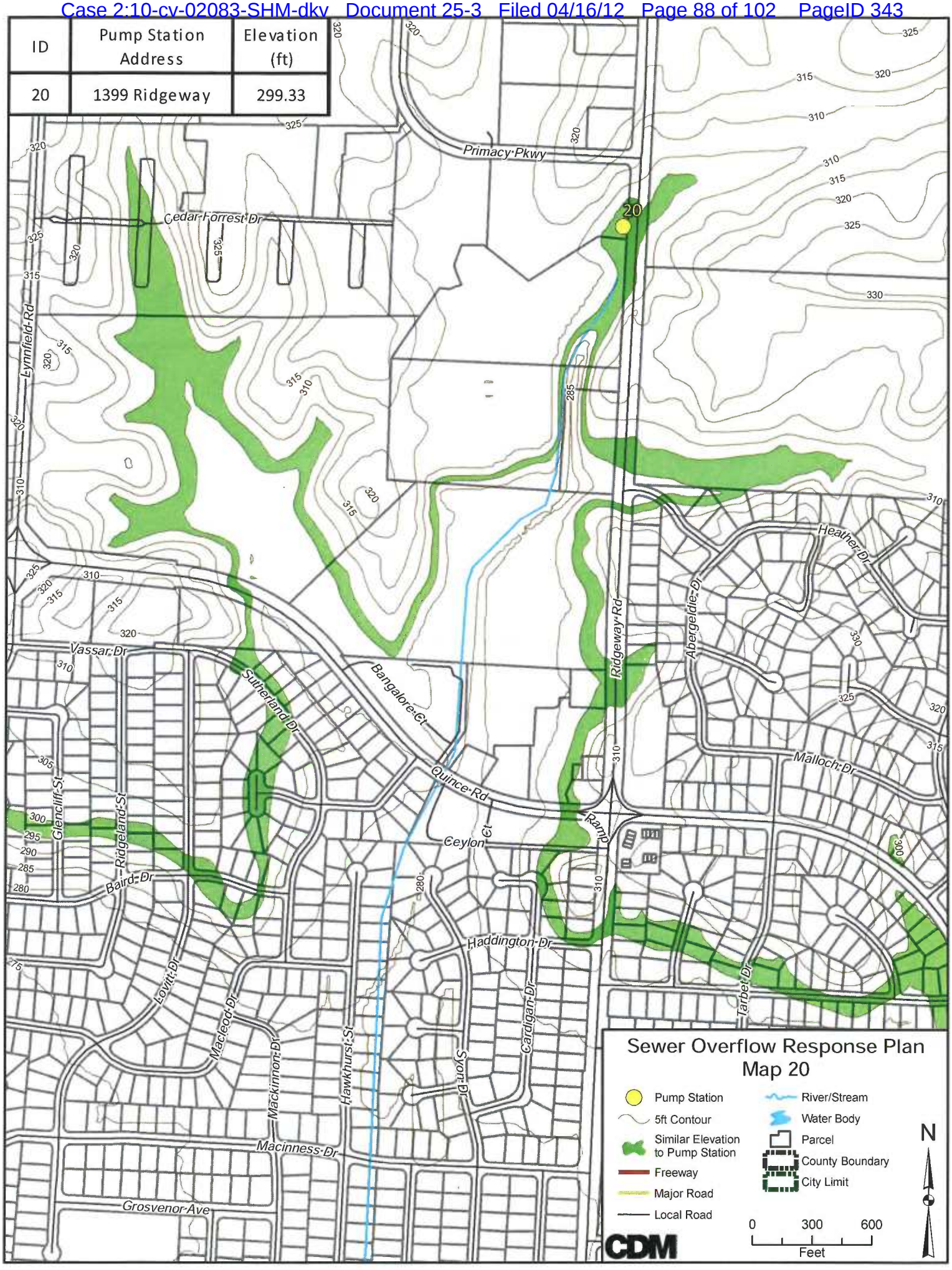


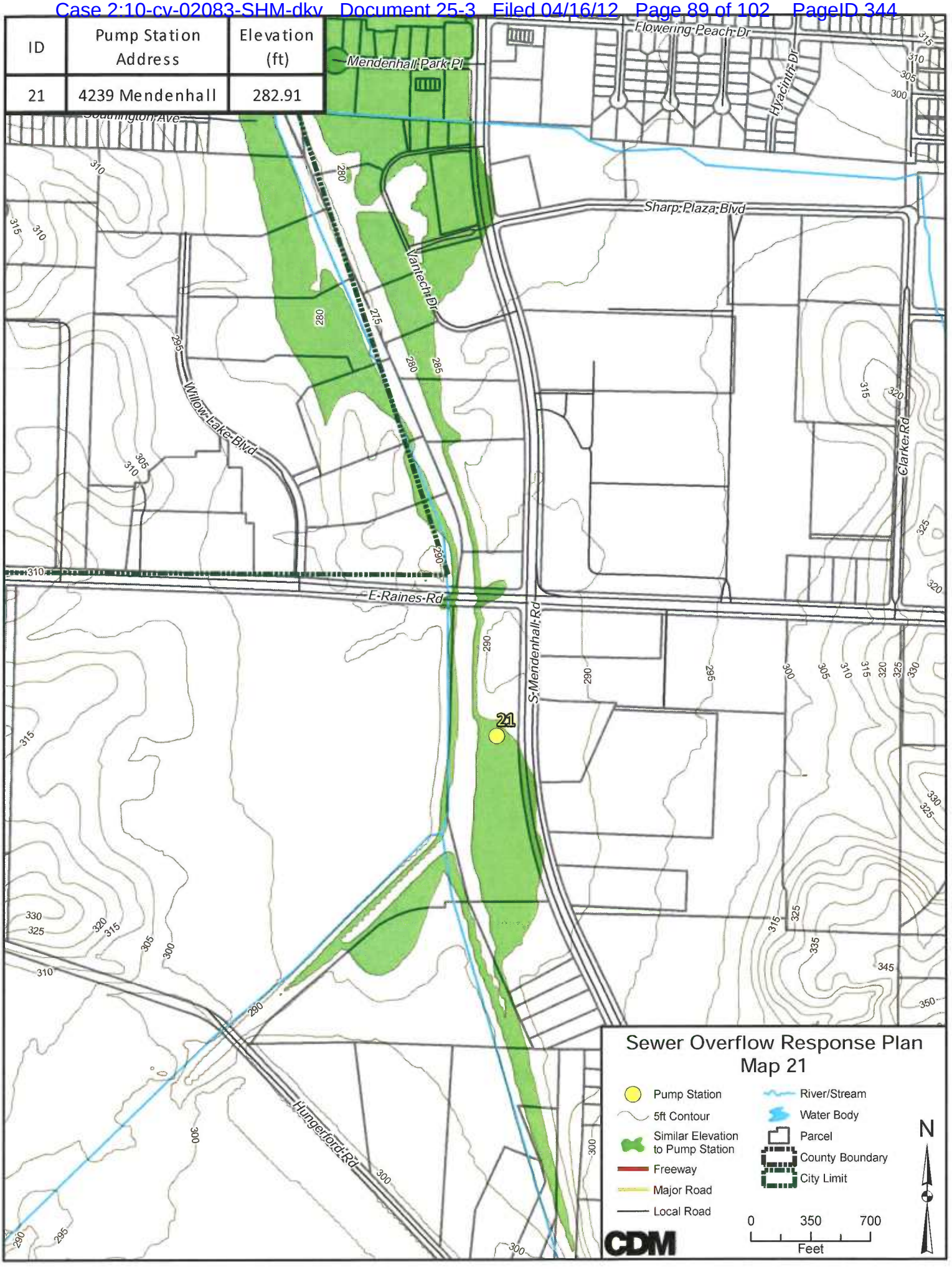

ID
Pump Station Address
Elevation (ft)
18
1141 N.Second
227.81
N 2nd St
N 7th St
N 6th St
Marble Ave
Cedar Ave
Hickory Ave
Sewer Overflow Response Plan
Map 18
Pump Station
5ft Contour
Similar Elevation to Pump Station
Freeway
Major Road
Local Road
River/Stream
Water Body
Parcel
County Boundary
City Limit
0
200
400
Feet
N
CDM

ID	Pump Station Address	Elevation (ft)
19	4791 Bolen Huse	255.91



ID	Pump Station Address	Elevation (ft)
20	1399 Ridgeway	299.33




ID
Pump Station Address
Elevation (ft)
21
4239 Mendenhall
282.91
Mendenhall Park Pl
Flowering Peach Dr
Hyacinth Dr
Sharp Plaza Blvd
Vantech Dr
Willow Lake Blvd
Clarke Rd
E Raines Rd
S Mendenhall Rd
Hungerford Rd
21
Sewer Overflow Response Plan
Map 21
Pump Station
5ft Contour
Similar Elevation to Pump Station
Freeway
Major Road
Local Road
River/Stream
Water Body
Parcel
County Boundary
City Limit
0
350
700
Feet
N
CDM

Appendix G

Pump Station Storage Volumes

Appendix G

Pump Station Storage Capacities

Station Name	Number of Pumps	Total Pump Run Time	Maximum Pump Capacity[1]	Estimated Influent Flow	Wetwell Volume	Storage Amount[2 3]
		Hours/Day	gpm	gpm	gallons	minutes
380 N Third	2	2.0	1,800	153	3,594	23.6
Mud Isle # 2	2	0.5	1,000	22	6,703	311.0
5230 Ral Millington	3	11.9	6,750	1,668	14,282	8.6
1490 N Bellevue	2	1.0	11,200	467	8,668	18.6
4791 Bolen-Huse	2	2.3	1,500	144	137,463	952.0
1254 Big Orange	2	16.3	1,500	1,022	80,009	78.3
8709 Rockcreek	2	0.9	1,100	43	2,202	51.6
1525 Kimbrough	3	18.4	12,500	4,786	7,893	1.6
1399 Ridgeway	2	3.9	1,500	244	31,794	130.6
950 Early Maxwell	2	1.0	2,700	113	11,510	102.3
4239 S. Mendenhall	3	24.4	20,000	10,158	190,092	18.7
1324 W Holmes	2	0.8	2,400	83	4,228	51.1
4950 East Shore	2	0.6	1,000	26	4,228	163.5
1474 W Shelby Dr.	3	4.0	1,200	101	11,745	116.4
1585 W Mitchell	2	0.3	1,200	16	9,396	605.5
Riverport # 2	2	19.6	2,400	1,962	11,970	6.1
1043 Wilson	2	18.7	4,000	3,121	14,962	4.8
386 Jack Carley	3	2.2	2,500	113	29,363	259.5
2820 Harbor	4	47.6	15,000	9,914	32,299	3.3
35 W Saffarans	3	25.0	45,000	23,438	1,093,423	46.7
1141 N Second	3	2.6	9,000	485	96,146	198.3

[1] Based on maximum pump run time provided by City.

[2] Pump stations at 1525 Kimbrough and 2820 Harbor currenlty have on-site back-up generators.

[2] Storage amount is based off of n-1 possible pump run times.

Appendix H

Standard Operating Procedures

STANDARD OPERATING PROCEDURE	REVISION #: 2006_01
LOCATION: Wastewater Lift Stations	REVISION DATE:
SOP NAME: Pump Station Alarm Response Procedures	9/8/2006
SOP CODE: #3.5.1 CS-PSAlarmsGeneralResponse	PAGE 1 OF 3

1.0 OBJECTIVE

Provide general guidance for station crews in the response to pumping station alarms.

2.0 BACKGROUND

Alarms are received 24 hours a day. They are monitored in two places: at the Lift Station shop Monday – Friday 0700 to 1500 hours and by the Emergency Management Agency (EMA) during the night (1500 – 0700) and for 24 hours a day on weekends and holidays.

All Lift Station personnel are responsible for alarm monitoring during the normal work day. Lift Station crews are responsible for the investigation and correction of all alarms. All alarms will be addressed regardless of whether the station is within the crew's assigned area or not. Coordination between crews and the General Foreman is required.

3.0 PROCEDURES

During normal work days (Monday – Friday, 0700 – 1500 hours), an alarm will be displayed on the Lift Station shop computer screen and monitored by Collection System personnel:

1. Information displayed on the screen is as follows:
    a. HIGH WET PIT (Zone 1)
    b. HIGH DRY PIT (Zone 2)
    c. POWERFAILURE (Zone 3) (if provided)
    d. STATION #
2. An audible alarm will be generated by the computer and will continue until acknowledged.
3. The General Foreman or a designate will radio the assigned crew for that station to perform a station check.

NOTE: Persons designated responsible for monitoring alarms and notifying the crews may include the machinist, a maintenance helper, station engineer, shop keeper or others. Someone must be present and designated to listen for alarms, all personnel are responsible for monitoring alarms.

4. The crew member responds to the alarmed station.
5. At the station, perform pre-check for entry (refer to station check SOP), observe for flooding, make assessment of problem and make repairs if possible or radio for crew assistance or for General Foreman.

6. When the problem is repaired, alarm cleared and station returned to service, radio the General Foreman or Manager of the results.
7. Before departing, the crew should wait for a period of time to determine if the repairs or fixes solved the problem and no further alarms are noted.
8. The crew should stay within the local area of the station if possible to answer a repeat alarm unless another alarm is received at another station.

During off-hours (Monday – Friday, 1500 to 0700 hours, weekends and holidays), an alarm will be monitored by EMA and the responsible call-out person will be contacted.

9. Prior to leaving the shop at the end of the normal work day, silence the Lift Station Shop computer's audible alarm by pressing ALT-S on the keyboard.
    a. Upon returning in the morning, reactivate the computer's audible alarm.
10. If crew(s) is still working beyond 1500 hours, they will contact EMA to advise that they are still available.
    a. When the crew(s) is finished working beyond 1500 hours, they will contact EMA to advise them that they are finished working.
11. When an alarm is received by EMA they will call the responsible party from a computer call out list. EMA will continue calling until a responsible party is contacted. Responsible parties generally include the three station engineers.
12. The station engineer will respond with the City truck to the alarm and determine the cause of the alarm and if assistance is required. If required, the station engineer will contact a maintenance helper or others and radio EMA of the situation.
13. When the problem is repaired, alarm cleared and station returned to service, radio EMA of the results.
14. Before departing, the crew should wait for a period of time to determine if the repairs or fixes solved the problem and no further alarms are noted.

WARNING: If severe problems are observed to include overflowing manhole, call the General Foreman immediately notifying him of swamped station and the need for assistance. Return to the shop and pickup a trailer pump unless instructed otherwise by the General Foreman.

NOTE: The Memphis/Shelby County Emergency Management Agency's dispatcher SOP for handling alarms is attached below for reference.

FROM :Memphis/Shelby County EMA FAX NO. :9014584117 Jun. 07 2006 02:33PM P2

Memphis/Shelby County Emergency Management Agency Policies/Procedures/SOP	Number:	Date:
	Subject: Flood Control Alarms	

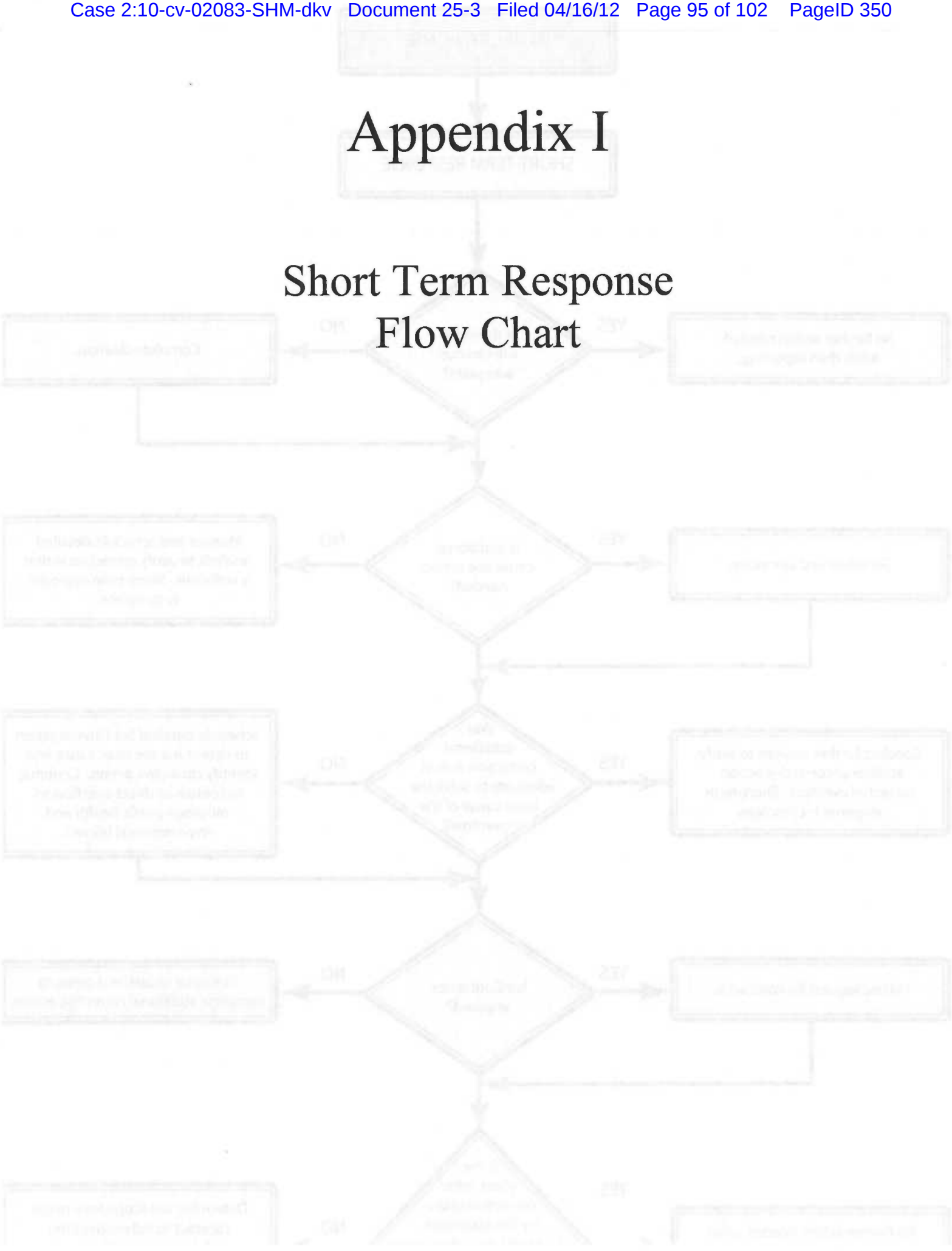
1. You will need to login at the start of your shift. Press L and enter your first and last initial, enter the password BMA, and then press F1 to exit.
2. When Alarm sounds, press the space bar to silence alarm. That will bring up the alarm location page.
3. Hit "F1" for the roll. This will bring up a list of people to call. Call them in the order listed until you get someone to respond.
4. Tell them the location and the problem.
5. Log information on the operations log, assign a flood control #, and log in the flood control notebook.
6. Hit "F4" for comments and type the name of the person responding. Press enter twice.
7. Hit "F9" for dispatch. At the bottom of the screen it will ask you, yes or no to dispatch. Type Y and press enter.
8. Hit "F3" to put the call on hold. Monitor the call on the Flood Control console.
9. To get the call back off hold press H. It will show you the calls holding. Highlight the call you want and press enter. Highlight "other" then press enter" enter the name of the person responding.
10. The responder may ask you if the call has restored. Hit "F6" and it will show you the history of the call. Tell the responder if it has restored.
11. If this is ok, hit "F5" to restore the alarm and then the space bar. It will ask you the cause of the alarm, the responder should tell you what was wrong.
12. Select the appropriate answer and type in a comment and press enter. The alarm will reset.
13. Do not call anyone out on "Low Battery" or "Battery Restore".

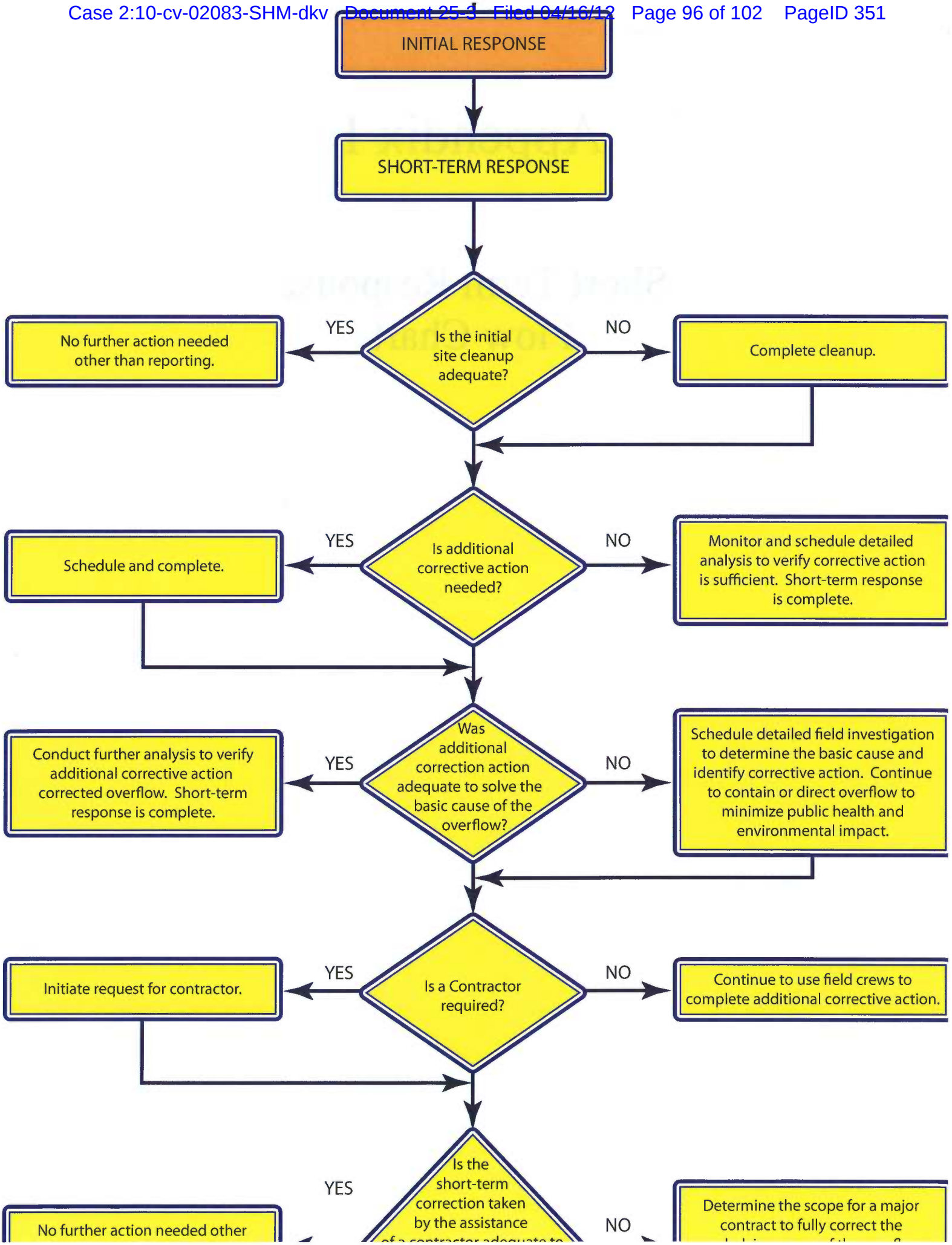
(During business hours Mon-Fri 07:00-15:00, when an alarm sounds, press the space bar to silence, press "F5" and enter business hours in actual alarm cause, and press enter twice)

Make sure Flood is turned up on the radio console from 15:00-07:00 daily and 24 hrs holidays/weekends

Appendix I

Short Term Response Flow Chart




INITIAL RESPONSE
SHORT-TERM RESPONSE
Is the initial site cleanup adequate?
YES
No further action needed other than reporting.
NO
Complete cleanup.
Is additional corrective action needed?
YES
Schedule and complete.
NO
Monitor and schedule detailed analysis to verify corrective action is sufficient. Short-term response is complete.
Was additional correction action adequate to solve the basic cause of the overflow?
YES
Conduct further analysis to verify additional corrective action corrected overflow. Short-term response is complete.
NO
Schedule detailed field investigation to determine the basic cause and identify corrective action. Continue to contain or direct overflow to minimize public health and environmental impact.
Is a Contractor required?
YES
Initiate request for contractor.
NO
Continue to use field crews to complete additional corrective action.
Is the short-term correction taken by the assistance
YES
No further action needed other
NO
Determine the scope for a major contract to fully correct the

Appendix J

TDEC Reporting Letter

(Enter Date)

Eddy Bouzeid
Tennessee Department of Environment and Conservation
Suite E-645 Perimeter Parkway
2510 Mt. Moriah
Memphis, TN 38115-1520

Subject: Sanitary Sewer Overflow Reporting

Dear Mr. Bouzeid:

On (date) the (Environmental Maintenance Manager/Wastewater Collection Systems Administrator) of the City of Memphis notified you by phone that a sanitary sewer overflow had occurred at (location) from a (system component). The City received notification of the SSO at approximately (date & time). The suspected cause of the overflow was the (describe cause). A crew was dispatched to the location and (describe actions taken to stop the SSO or minimize the volume of flow from the SSO) were(was) completed at (date & time). (Describe action taken to clean-up SSO). Based upon the information available at this time, the overflow volume was approximately (volume). The overflow was (stopped/is anticipated to be stopped) at (date & time). There (are/are not) potential impacts to a receiving water (to include – describe stream affiliation, if any). There (are/are not) affected human contact areas (identify locations). The last SSO to occur at this location was (date). The additional action taken by the City to prevent a reoccurrence included (insert action, i.e. additional investigation, TV, PM, etc.). Information to the public (was/was not) made available (through the following resources, include other agencies or departments).

Please contact me at 529-0237 if you need additional information on this matter.

Respectfully,

Ken Martin
Administrator
Wastewater Collection Systems

c. file

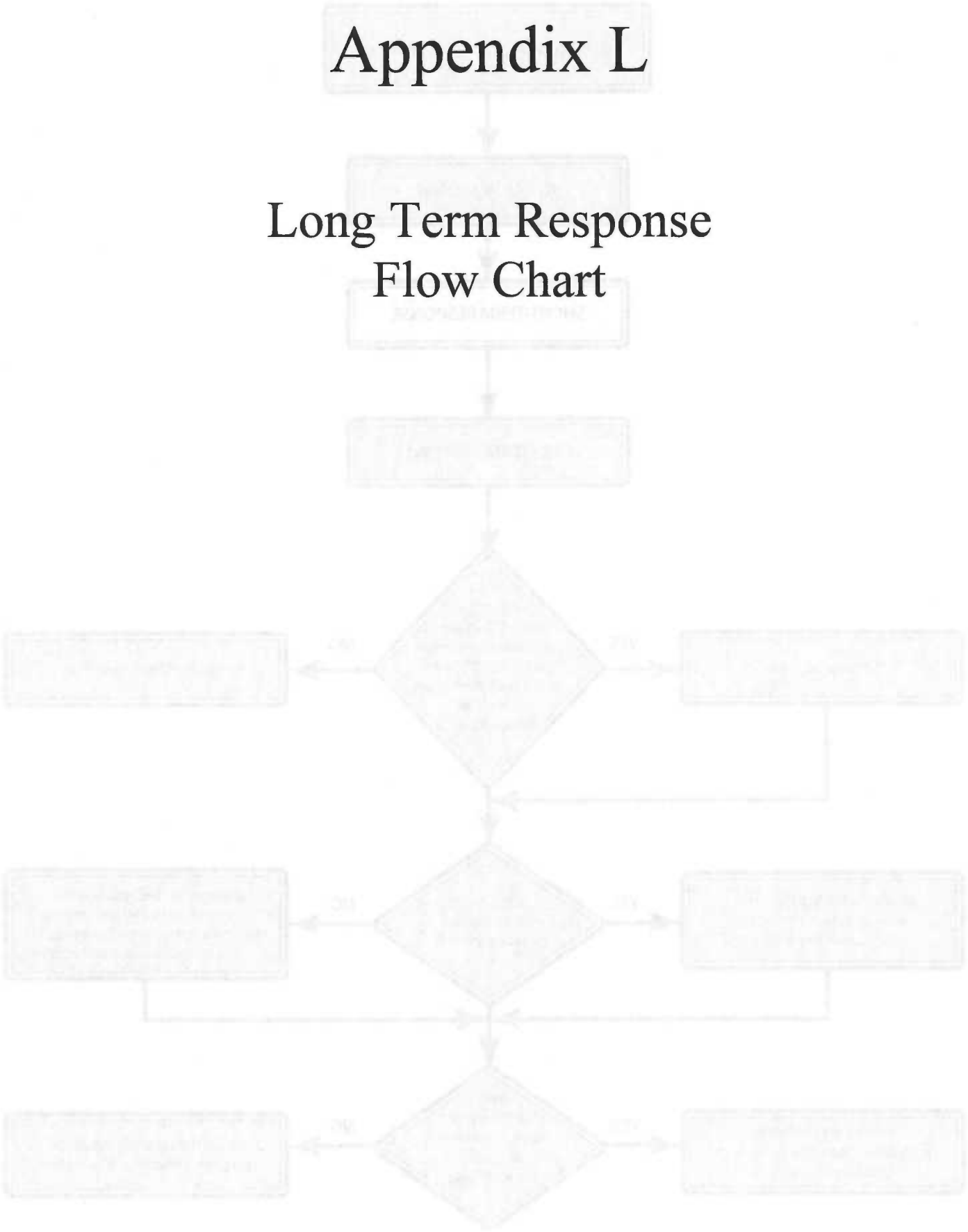
Appendix K

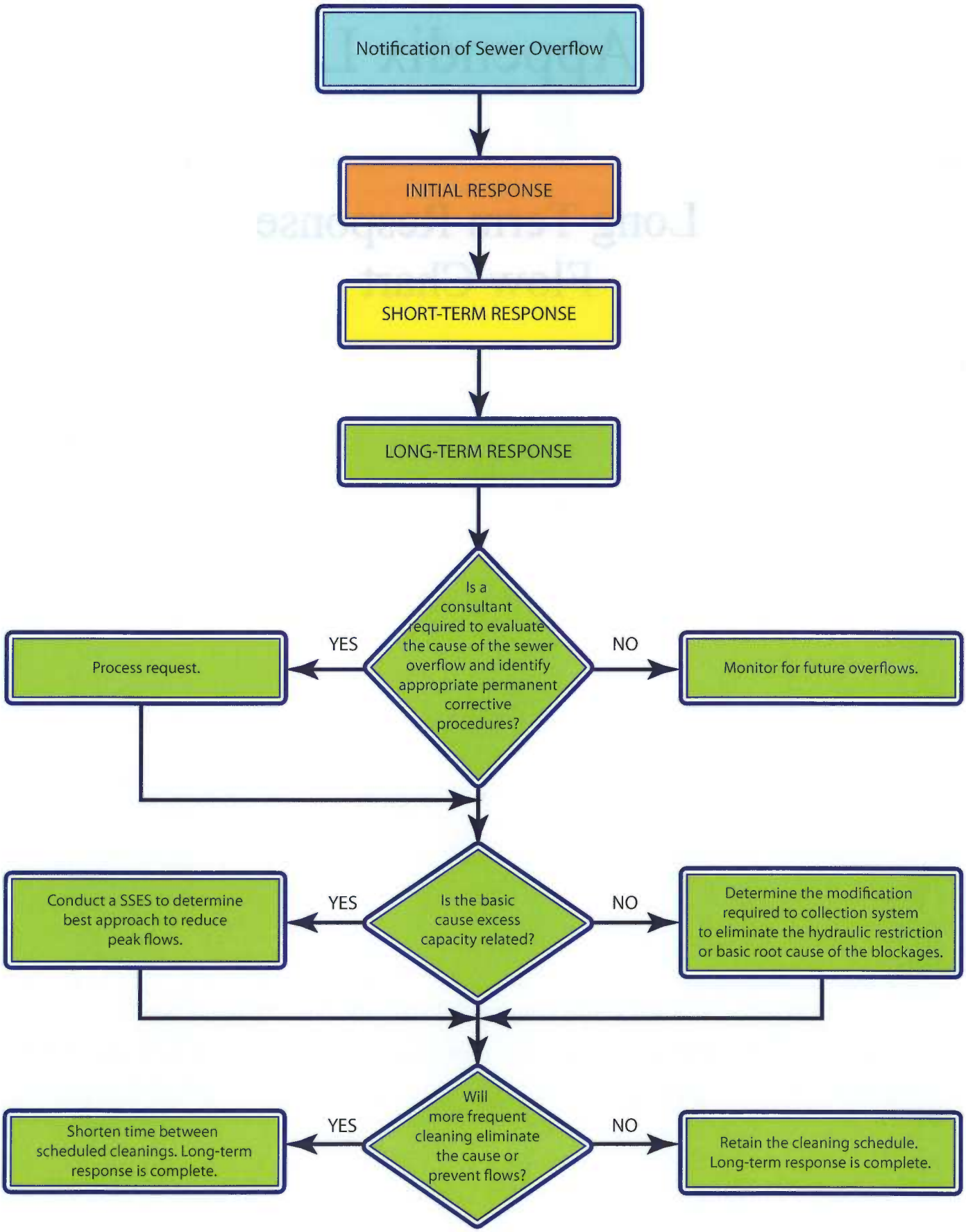
San Diego Wastewater Collection System Division SSO Estimation Method

25 GPM
150 GPM
to 10 GPM

Appendix L

Long Term Response Flow Chart




Notification of Sewer Overflow
INITIAL RESPONSE
SHORT-TERM RESPONSE
LONG-TERM RESPONSE
Is a consultant required to evaluate the cause of the sewer overflow and identify appropriate permanent corrective procedures?
YES
Process request.
NO
Monitor for future overflows.
Is the basic cause excess capacity related?
YES
Conduct a SSES to determine best approach to reduce peak flows.
NO
Determine the modification required to collection system to eliminate the hydraulic restriction or basic root cause of the blockages.
Will more frequent cleaning eliminate the cause or prevent flows?
YES
Shorten time between scheduled cleanings. Long-term response is complete.
NO
Retain the cleaning schedule. Long-term response is complete.