



September 22, 2023

Via Email:

DOJ EES Case Management Unit, [eescdcopy.enrd@usdoj.gov](mailto:eescdcopy.enrd@usdoj.gov)  
USEPA Chief, NPDES Section (3ED32), Steve Maslowski - [Maslowski.Steven@epa.gov](mailto:Maslowski.Steven@epa.gov)  
USEPA Senior Assistant Regional Counsel, Pamela J. Lazos - [R3\\_ORC\\_mailbox@epa.gov](mailto:R3_ORC_mailbox@epa.gov)  
PADEP Regional Counsel, Dawn Herb - [dherb@pa.gov](mailto:dherb@pa.gov)  
PADEP Environmental Program Manager, Summer Kunkel - [sukunkel@pa.gov](mailto:sukunkel@pa.gov)  
CRW CEO, Charlotte Katzenmoyer - [Charlotte.Katzenmoyer@capitalregionwater.com](mailto:Charlotte.Katzenmoyer@capitalregionwater.com)  
CRW Counsel, Frederic P. Andes - [Fredric.Andes@btlaw.com](mailto:Fredric.Andes@btlaw.com)  
City of Harrisburg, Mayor - [mayor@harrisburgpa.gov](mailto:mayor@harrisburgpa.gov)

RE: DJ# 90-5-1-1-10157 - Civil Action No. 1:15-cv-00291-CCC: Sensitive Areas Report

To Plaintiffs, Civil Action No. 1:15-cv-00291-CCC,

Capital Region Water (CRW) is required to submit to a list of deadlines under Paragraph V(D)(18) of the Modification to partial Consent Decree(MPCD) lodged February 13, 2023:

18. *Sensitive Areas/Priority Areas. Within thirty (30) Days of the Effective Date, CRW shall submit to Plaintiffs for review and approval in accordance with the requirements of Section VI (Review and Approval of Deliverables) a report or technical memorandum that addresses the topics of Sensitive Areas/Priority Areas in the Harrisburg Receiving Waters. CRW shall carry out adequate and appropriate investigation of each type of Sensitive Area, including inquiries of appropriate state and federal agencies, and shall include detailed documentation of those efforts.*

Please see the enclosed PDF of the Sensitive Areas Report for your review.

Please contact me directly to discuss any questions or concerns you may have.

Sincerely yours,

A handwritten signature in blue ink that reads "Claire Maulhardt". The signature is written in a cursive, flowing style.

Claire Maulhardt, PLA  
City Beautiful H2O Program Manager  
717-216-5269



## Introduction

Capital Region Water (CRW) is required to perform a review of the Sensitive Areas/Priority Areas in the Harrisburg Receiving Waters under Paragraph V(D)(18) of the Modification to Partial Consent Decree (MPCD) lodged August 25, 2023:

18. *Sensitive Areas/Priority Areas. Within thirty (30) Days of the Effective Date, CRW shall submit to Plaintiffs for review and approval in accordance with the requirements of Section VI (Review and Approval of Deliverables) a report or technical memorandum that addresses the topics of Sensitive Areas/Priority Areas in the Harrisburg Receiving Waters. CRW shall carry out adequate and appropriate investigation of each type of Sensitive Area, including inquiries of appropriate state and federal agencies, and shall include detailed documentation of those efforts.*

The MPCD defines Sensitive Areas as follows: *"Sensitive Areas" shall mean those areas designated by PADEP, in coordination with state and federal agencies, as appropriate, Outstanding National Resource Waters, National Marine Sanctuaries, waters with threatened or endangered species and their habitat, waters with primary contact recreation, public drinking water intakes or their designated protection areas, and shellfish beds, as set forth in Section II.C.3. of the CSO Policy.*

This letter report is CRW's review of Sensitive Areas/Priority Areas in the Harrisburg Receiving Waters, in fulfillment of Paragraph V(D)(18).

## Overview of CRW Combined Sewer System, Outfall Locations, and Receiving Waters

Capital Region Water owns and operates 58 permitted CSO outfalls which discharge combined stormwater and wastewater to the Susquehanna River or Paxton Creek (tributary of Susquehanna River). In addition, two emergency outfalls are located at the Front Street Pumping Station and Spring Creek Pumping Station. Of these 60 total CSO outfalls, 28 outfalls discharge to the Susquehanna River and 32 outfalls discharge to Paxton Creek. **Figure 1** shows the location of each outfall.

In the Susquehanna River, the outfall furthest upstream is located near Vaughn Street and the furthest downstream outfall is at the Front Street Pumping Station located near the Interstate 83 bridge, approximately 4,400 feet upstream of the mouth of Paxton Creek. Overall, the outfalls span approximately 21,000 feet of the eastern bank of the Susquehanna River.

In Paxton Creek, the outfall furthest upstream is on the west bank of the creek south of Elmerton Avenue off Industrial Road and the outfall furthest downstream is on the east bank of the creek near the Spring Creek Pumping Station just upstream of the Paxton Creek confluence with the River. The Paxton-Susquehanna confluence is approximately 5,600 feet upstream of the Steelton intake.

Overall, the outfalls span approximately 19,000 feet of Paxton Creek. CRW is participating in proposed efforts to naturalize the Paxton Creek channel and corridor through the Paxton Creek Greenway Partnership. CRW intends to take the opportunity to build a new interceptor to replace the existing hundred-plus-year-old interceptor and to address CSO outfalls in conjunction with the stream naturalization project.

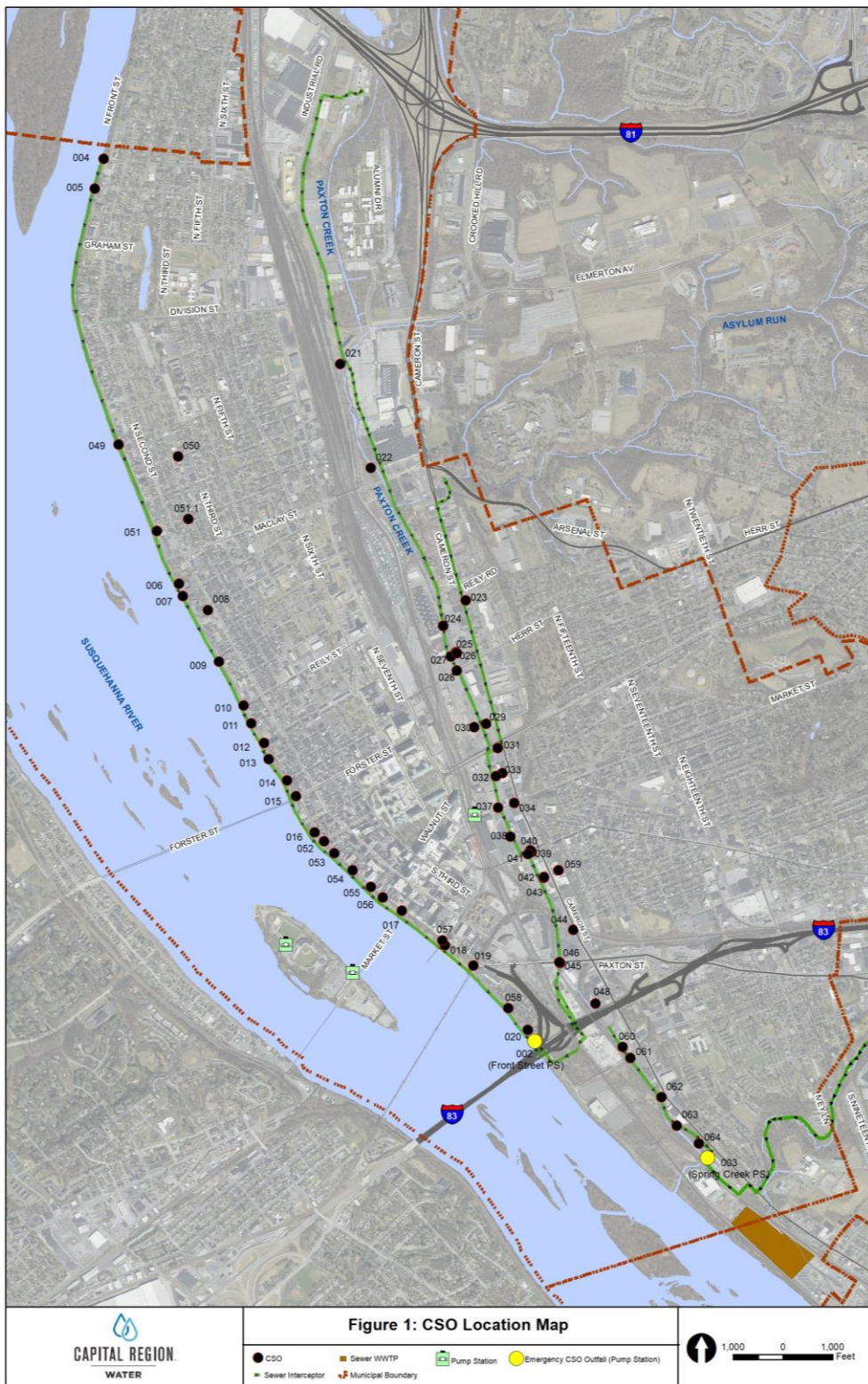


Figure 1. Locations of the Combined Sewer Overflow Outfalls

Chapter 93 of the Pennsylvania Code defines designated uses of the Waters of the Commonwealth, which are listed for Paxton Creek and the Susquehanna River below:

- Aquatic Life: Warm Water Fishes, Migratory Fishes
- Water Supply: Potable, Industrial, Livestock, Wildlife, Irrigation
- Recreation: Boating, Fishing, Water Contact Sports, Esthetics

## Outstanding National Resource Waters

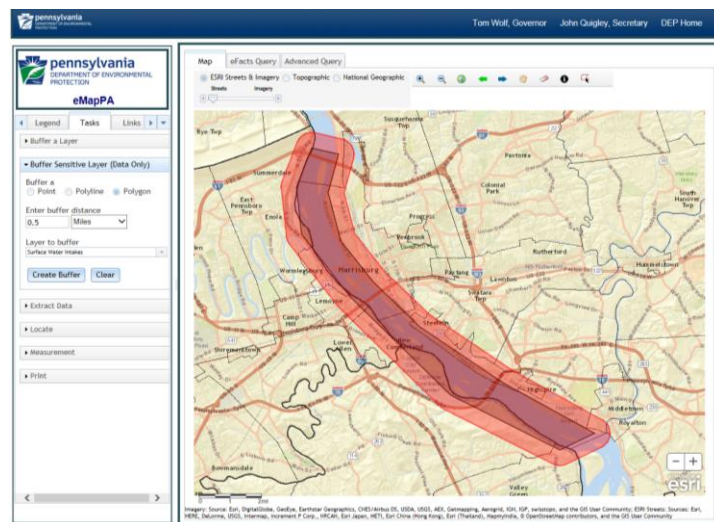
Neither of the two receiving waters, the Susquehanna River and Paxton Creek, is designated as an Outstanding National Resource Water.

## National Marine Sanctuary

Neither of the two receiving waters, the Susquehanna River or Paxton Creek, is designated as a National Marine Sanctuary.

## Public Water Intakes

The primary source of drinking water for CRW's water system is the William T. DeHart Dam and Reservoir located 20 miles northeast of the city in the Clarks Valley watershed. The Susquehanna River provides CRW with backup water supply and is currently only in use in cases of severe drought or other emergency and routine short-term operational exercises that occur in the fall of each year. This water intake is approximately 775 feet downstream of CSO-004 & CSO-005. CRW takes precautions to avoid periods of CSO activity when scheduling the river run for annual operational exercises. If a storm should arise during the river run, we cease the intake operations until the CSO activity has stopped for 24 hours.



*Figure 2. Surface Water Intakes Downstream of Harrisburg. The red area indicates the river area investigated in the eMapPA assessment. (Source: eMapPA)*

There are no public water intakes on Paxton Creek. The nearest downstream public water intake in the Susquehanna River is for Steelton Borough. The intake is located approximately 1,150 feet from the eastern shore of the river near Stucker Island. This is approximately 6,000 feet downstream of the nearest CSO outfall (from Paxton Creek). The Pennsylvania Department of Environmental

Protection's (PADEP's) online mapping tool eMapPA was utilized to conduct a surface intake map query of the area shown in **Figure 2**. The Steelton intake was the only viable search result. The intake is located in the center of the channel to avoid potential impacts from any pollutant plume traveling along the shoreline. There are no known impacts to the Steelton intake from CRW's CSO shoreline discharges on the Susquehanna River. The confluence of Paxton Creek and the Susquehanna River is approximately 5,600 feet upstream of the Steelton intake.

### Public Access Points/Primary Contact Recreation

A definition of primary contact recreation is provided in EPA's 2012 Recreational Water Quality Criteria (RWQC) document as "*activities where immersion and ingestion are likely and there is a high degree of bodily contact with the water, such as swimming, bathing, surfing, water skiing, tubing, skin diving, water play by children, or similar water-contact activities*" (EPA, 2012). PADEP defines "Water Contact Sports" as "*Use of the water for swimming and related activities*" (25 PA Code § 93.4, see Chapter 93).

The following public access points along the Susquehanna River have been identified:

- **Dock Street Dam Boat Launch:** This boat ramp is located at the Interstate 83 bridge and provides public access for boating, including canoeing and kayaking.
- **City Island Boat Launch:** This boat ramp is located on City Island, which is more than 1,500 feet from the eastern shore where the CSO outfalls are located.
- **City Island Public Beach:** This public park area includes a sloped concrete apron providing access to the Susquehanna River for canoeing and kayaking. The City of Harrisburg does not currently permit swimming and signs are posted prohibiting swimming. The access point is more than 1,500 feet from the eastern shore where the CSO outfalls are located.
- **Riverfront Park/Capital Area Greenbelt:** The Riverfront Park extends from Vaughn Street to Paxton Street along the eastern shore of the river. Concrete steps extend to the waterfront for much of the park, beginning at MacClay Street and extending to the Interstate 83 bridge. The steps are primarily used for fishing and do not readily facilitate entry into the water.

Because of these public access points for recreation, CRW will develop a CSO LTCP implementation schedule, as part of the ongoing Long Term Control Plan (LTCP) development process, that gives higher priority to controlling CSOs to the Susquehanna River. However, CRW would like to clarify that the points of potential (though prohibited by posted signage) primary contact within the Susquehanna River are located on City Island at the public beach. The best available information indicates these locations are not susceptible to discharges from CRW's CSO outfalls due to the shallow depth and high velocity in the Susquehanna River, which limits the extent of lateral mixing of a CSO plume. This limited lateral mixing was evaluated by PADEP, in the agency's 2016 Integrated

Report, and by CRW's predecessor agency, The Harrisburg Authority, in its 2005 LTCP. In the 2005 LTCP, longitudinal transect monitoring and water quality modeling found that nearshore CSO discharges to the Susquehanna do not migrate or disperse far from the shore. Furthermore, the points of use are typically not utilized during wet weather events.

In preparation of its LTCP update, CRW is further evaluating the potential for lateral mixing of the CSO plume. It should be noted there will be other criteria, such as financial capability, construction sequencing considerations, cost-effectiveness, the structural condition of CRW's assets, and susceptibility to river intrusion, that will also be key criteria for properly phasing the recommended system enhancements under the updated plan.

There are no designated public access points along Paxton Creek. The majority of the creek channel within the area of CSO outfalls is a concrete lined channel that makes public access difficult. Furthermore, the flashy nature of the watershed, high creek depths during wet weather flows, and velocities in the concrete channel make Paxton Creek unsafe for public recreation during wet weather events.

### **Waters with Threatened or Endangered Species**

The Pennsylvania Natural Heritage Program's online search tool was utilized to search the subject area. The results are summarized below:

- Wildwood Lake – *American Lotus*: This site is upstream of all CRW outfalls, and therefore this location and species is not considered to be a sensitive area for this analysis.
- City of Harrisburg – *Peregrine Falcon*: The nesting sites are within the City on rooftops, and therefore this location and species is not considered to be a sensitive area for this analysis.
- Susquehanna River – *Seven Species of Concern (four freshwater mussels, toothcup (plant), and two additional species (unnamed))*: The aquatic and riparian habitats among the river's islands support these species of concern. However, the islands are typically more than 1,000 feet from the eastern shore of the river and the best available information indicates that these areas are not directly influenced by the CSO outfalls.

Based upon these findings, there are not any sensitive areas in the Susquehanna River or Paxton Creek due to threatened or endangered species.

### **Water Quality Summary**

For convenience, this section provides a summary of water quality information supporting the analysis of sensitive areas above. As part of the ongoing LTCP update, CRW prepared two technical memoranda and a Water Quality Modeling Plan that reviewed available data on the water quality of the receiving waters. Complete details are available in the December 22, 2014, July 27, 2015, and June 10, 2022, submissions to the regulatory agencies.

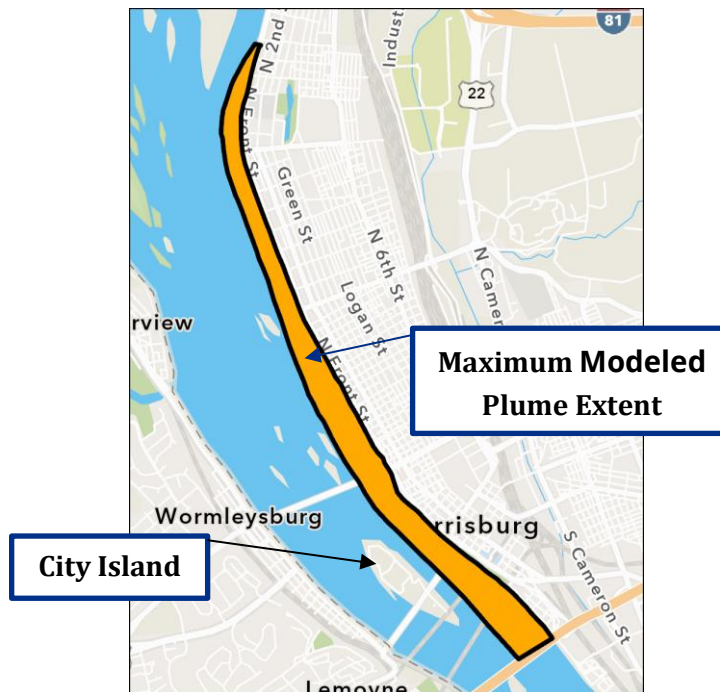
- The Susquehanna River in the vicinity of Harrisburg is listed by PADEP as impaired for pH, bacteria, and PCBs. The Susquehanna River pollutants of concern, as listed in the current modification to the MPCD, are bacteria (fecal coliform and *E. coli*), total suspended solids (TSS), nitrogen, and phosphorus.
- In the Susquehanna River, prior analysis by The Harrisburg Authority has indicated that the bacteria plume generated by CRW CSOs remains in the nearshore portion of the river adjacent to the City of Harrisburg and persists in the nearshore area for only a few hours following a CSO event (EPA, 2008).
- Paxton Creek is listed by PADEP as impaired for suspended solids (siltation), dissolved oxygen/biochemical oxygen demand (DO/BOD), bacteria, water/flow variability, and other habitat alterations. Nutrients were identified as a cause of impairment in the total maximum daily load (TMDL) by EPA (2008). However, in the 2010 assessment cycle, PADEP reevaluated water quality monitoring data in Paxton Creek and determined that the previously issued nutrient impairment was in 'error' and no longer supported by data (EPA 2013, pg. 2). This remains the case in the 2022 PADEP Integrated Report, where the DO impairment cause is listed as BOD (PADEP, 2022). Pollutants of concern, as listed in the current modification to the MPCD, are bacteria, DO, TSS, nitrogen, and phosphorus.
- The 2008 TMDL Report for Paxton Creek reported DO sags and attributed them to discharges from the combined sewer system. DO grab samples were collected periodically by the Susquehanna River Basin Commission (SRBC) at three locations between 1985 and 2015 (n = 56), with most of the data collected between 2006 and 2015. Additional DO data were collected by PADEP in 2006 associated with the TMDL, including continuous DO metering. The continuous DO meter was deployed in the vicinity of Shanois Street, near the historical USGS monitoring station (USGS 01571090, Paxton Creek at Harrisburg, PA) (CRW, 2023). PADEP conducted continuous DO metering between five and six stations such as PS0 (upstream of Wildwood Lake - range: 3.93 – 5.99 mg/L), and PC03 (before feeding into Susquehanna River - range: 1.77 – 4.96 mg/L), over three days in May, August, and September 2006 (EPA, 2008).
- The 2008 Paxton Creek TMDL Report indicates that sediment is the primary pollutant of concern in Paxton Creek. The sediment impairments in Paxton Creek are primarily caused by mobilization and deposition of stream channel materials, which in turn are caused by friction and high velocities resulting from urban wet weather discharges.

## Flow Characteristics along the Susquehanna River

The Susquehanna River is wide (nearly a mile across near Harrisburg), but shallow due to the influence of the low head Dock Street Dam. Therefore, vertical mixing can be assumed to be rapid, and lateral mixing relatively slow. The 2-dimensional RMA water quality modeling completed by The Harrisburg Authority in 2005 to support its Combined Sewer Overflow Management and Control



Program Act 537 Plan Update Revision/Long Term Control Plan indicated that the CSO plume remains along the eastern shore through the Dock Street Dam and does not impact City Island (Figure 3). The lateral mixing extent observed in the 2005 modeling concurs with DEP's observations.



*Figure 3. Maximum Extent of Fecal Coliform Plume Adapted from Harrisburg CSO Discharges from The Harrisburg Authority's Combined Sewer Overflow Management and Control Program Act 537 Plan Update Revision/Long Term Control Plan Water Quality Model Report*

A prior study by PADEP (2016) also indicated that lateral mixing is minimal in the Susquehanna River between the confluence of the Juniata River and Marietta. PADEP collected conductivity data at transects along the Lower Susquehanna River and major tributaries to evaluate lateral mixing, including transects on the Susquehanna River near Harrisburg (Rockville, City Island, Route 83 downstream of the dam, and Marietta). PADEP's reports indicate that little lateral mixing occurs across the Susquehanna River, with inputs from the Juniata River, the West Branch Susquehanna River, and mainstem Susquehanna River, and smaller tributaries. PADEP describes five distinct flow regimes through the Harrisburg reach of the Susquehanna River. This is demonstrated graphically in Figure 4, reproduced from the 2016 DEP *Integrated Report* (PADEP, 2016), which summarizes PADEP's analysis based on data collected at a transect located at Rockville.

Approximate delineation of distinct water quality differences on the Susquehanna River at Rockville, PA.



Figure 4. Approximate Extent of Lateral Mixing in the Susquehanna River at Rockville (PADEP, 2016)

## Flow Characteristics along Paxton Creek

To provide flood control, the quantity of Paxton Creek flow allowed to be conveyed through the City of Harrisburg is regulated by the Wildwood Lake outlet structure. It is a Morning Glory spillway, which consists of a one square foot low flow control orifice and a 20 square foot high flow orifice. When wet weather flow exceeds the capacity of the morning glory outlet control, it backs up into Wildwood Lake and is diverted to the Susquehanna River via a flood control outlet located at the northern end of the lake.

The Paxton Creek channel is narrow, shallow, vertically and laterally well-mixed. The channel is concrete lined for much of its length to reduce friction and to provide additional flood conveyance. The channel is not safe or appropriate for public recreation. Base flows are minimal because of the morning glory outlet structure, and the channel is hydraulically disconnected from the overbanks.

## Conclusions

The analysis presented above does not support designation of Sensitive Areas within CRW's combined sewer overflow receiving waters.

CRW intends to develop a CSO LTCP implementation schedule that, among other criteria, gives higher priority to controlling CSOs to the Susquehanna River.

While completing its LTCP update, CRW will evaluate whether there are any outfalls along the receiving waters that would require more attention than others in evaluating control options. CRW is continuing to develop the updated plan, which will include evaluating possibilities to consolidate and eliminate individual outfalls.

## References

Capital Region Water (CRW) (2023). Water Quality Modeling Plan.

Environmental Protection Agency (EPA) (2008). Nutrient and Sediment Total Maximum Daily Load in Paxton Creek Watershed, Pennsylvania. Prepared by the Louis Berger Group, Inc.

Environmental Protection Agency (EPA) (2012). Recreational Water Quality Criteria.

Environmental Protection Agency (EPA) (2013). Decision Rationale for the Withdrawal of the Nutrient TMDLs for the Paxton Creek Watershed, Pennsylvania.

The Harrisburg Authority (THA). 2005. Act 537 Plan Update Revision/Long-Term Control Plan. Attachment K: Susquehanna River Fecal Coliform Technical Memorandum.

PADEP (2016). Integrated Water Quality Report.

PADEP (2022). Integrated Water Quality Report.

Pennsylvania Code (2023). 25 PA. Chapter 93. Water Quality Standards.