

# **EXHIBIT X**

**BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

**AQUA PENNSYLVANIA, INC.**

**DOCKET NO. A-2022-3034143**

**AQUA STATEMENT NO. 4**

**DIRECT TESTIMONY OF  
MATTHEW J. MARCHISELLO, P.E.**

**With Regard To  
Shenandoah Dams**

**October 2022**

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1   **I.    INTRODUCTION**

2   **Q.    Please state your name and business address.**

3   A.    My name is Matthew J. Marchisello. My business address is 762 West Lancaster Avenue,  
4        Bryn Mawr, Pennsylvania 19010.

5  
6   **Q.    By whom are you employed and in what capacity?**

7   A.    I am employed by Aqua Pennsylvania, Inc., (“Aqua” or the “Company”) as an Intermediate  
8        Project Engineer.

9  
10   **Q.    Please provide a brief description of your education and work experience.**

11   A.    I received a Bachelor’s of Civil Engineering (B.C.E.) in 2003 and a Master’s Degree in  
12        Civil Engineering (M.C.E.) in 2005, both from Villanova University. I have worked as a  
13        consultant in dams engineering for over 15 years with Schnabel Engineering and O’Brien  
14        and Gere and have been involved with the design and construction of several dam  
15        rehabilitation projects. I have worked at Aqua since 2017 as a project engineer managing  
16        capital projects and compliance matters related to dams in Pennsylvania and serve as the  
17        corporate subject matter expert. In this capacity, I developed corporate standards for the  
18        operation, maintenance, inspection, and emergency procedures of dams across the  
19        Company. I have been an Adjunct Professor at Villanova University since 2019, where I  
20        assisted in developing a Certificate of Dams Engineering Program and created a graduate  
21        level course on the Analysis and Design of Dams. I currently teach this course and a  
22        graduate level course on Foundations Engineering. I have also been an Adjunct Professor

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1 at Rowan University since 2012 where I teach courses on Foundations Engineering and  
2 Earth Retaining Structures.

3

4 **Q. Do you hold any professional licenses?**

5 A. Yes. I am a Registered Professional Engineer in Pennsylvania.

6

7 **Q. Have you previously testified before the Pennsylvania Public Utility Commission**  
8 **(“PUC” or the “Commission”)?**

9 A. No.

10

11 **Q. What is the purpose of your Direct Testimony?**

12 A. The purpose of my Direct Testimony is to discuss the dams that are part of the Municipal  
13 Authority of the Borough of Shenandoah’s (“MABS”) treatment, distribution and storage  
14 system (“System”) and Aqua’s plans for ensuring continued compliance with all standards  
15 pertaining to the dams post-acquisition.

16

17 **Q. Are you sponsoring any Exhibits with the Company’s filing?**

18 A. No.

19

20 **II. OVERVIEW OF MABS’ DAMS & COMPLIANCE MATTERS**

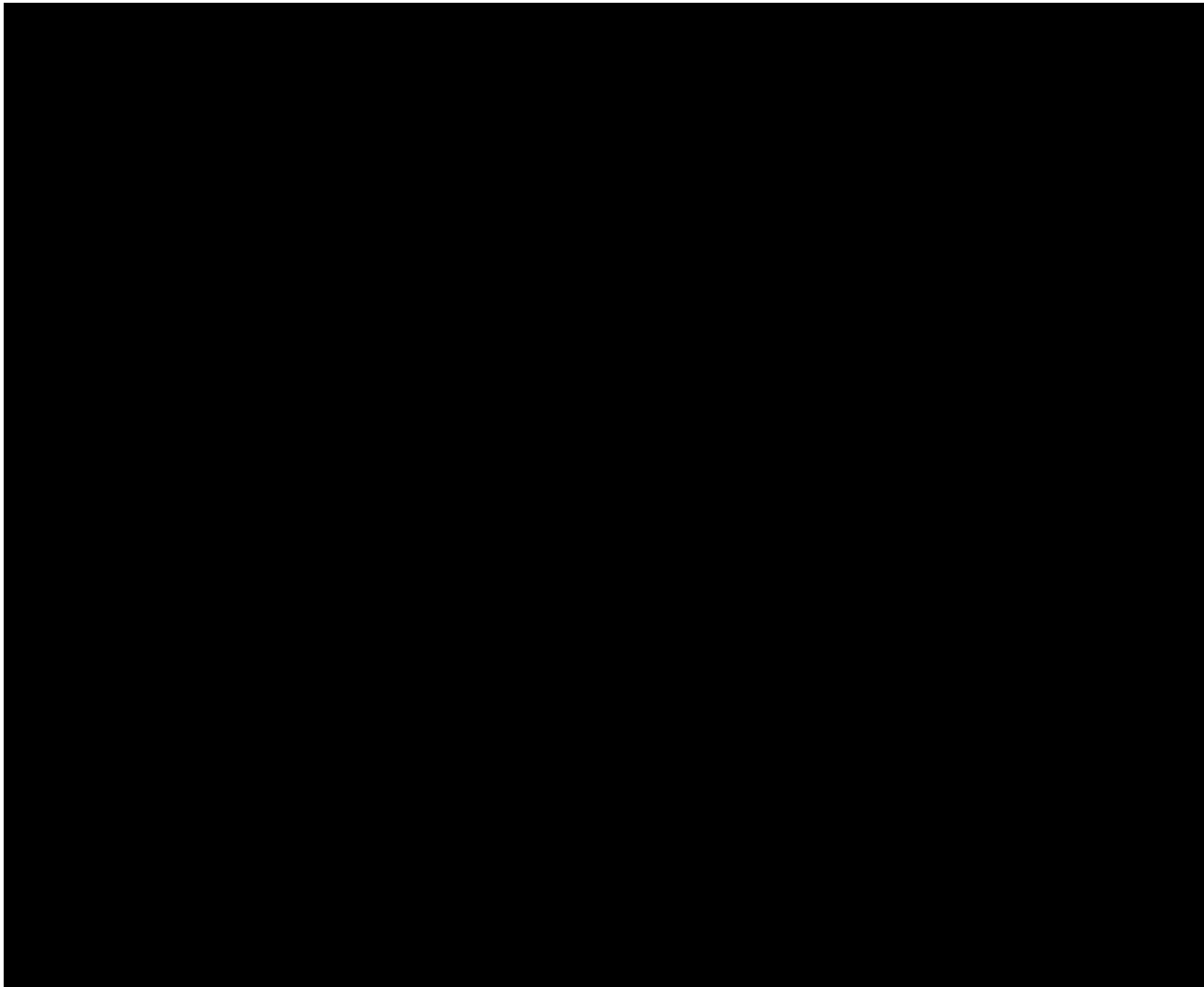
21 **Q. Please provide a general overview of the dams in the MABS System.**

22 A. The sources of supply for the MABS System consists of four (4) dams: Ringtown No. 5,  
23 Ringtown No. 6, Raven Run No. 2, and Raven Run No. 3. Raw water flows by gravity

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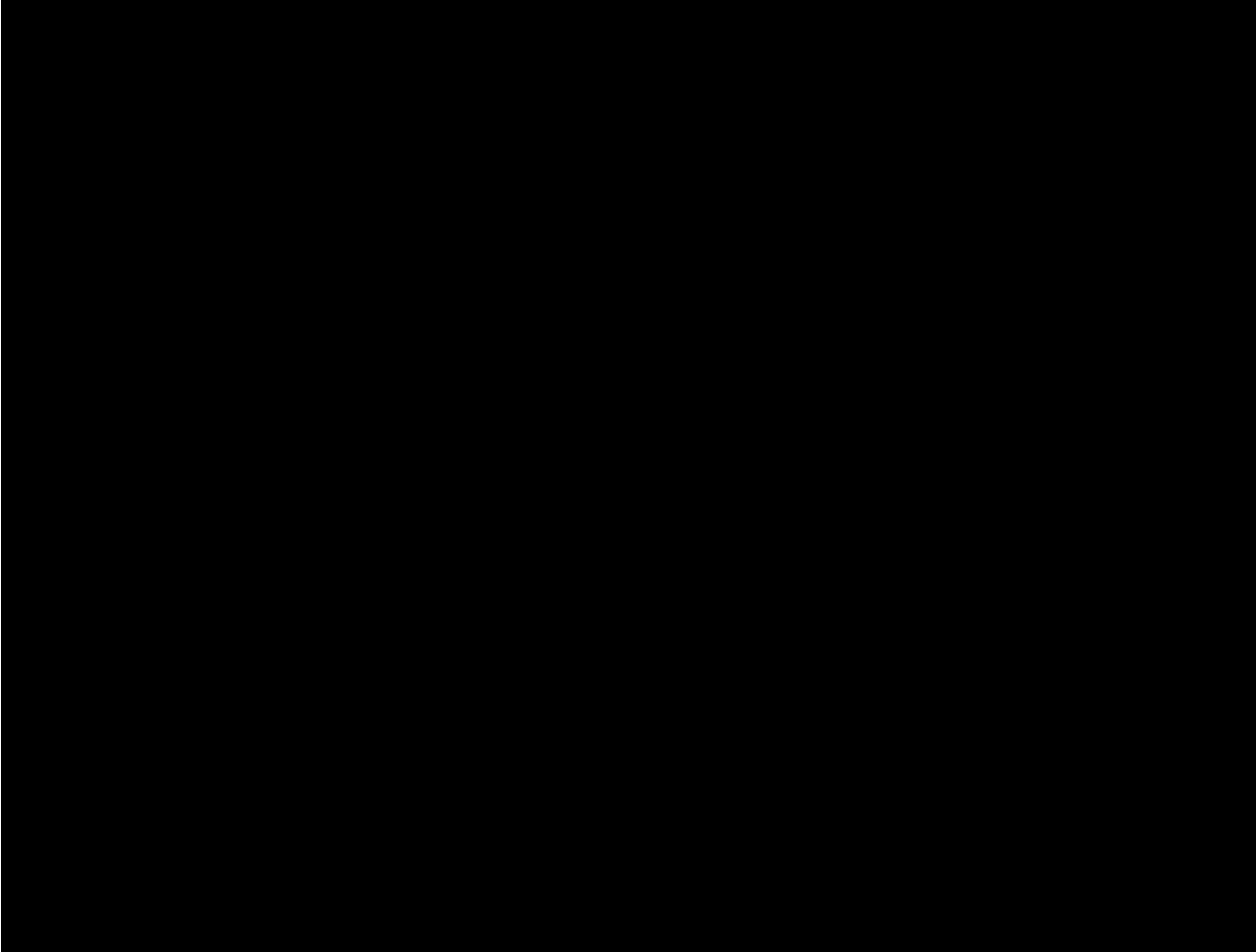
1 pipe from Ringtown No. 6 to Ringtown No. 5, which is then pumped to Raven Run No. 3  
2 which flows into Raven Run No. 2 by spillway. These dams are over 100 years old and  
3 adequate records do not exist for the exact date of construction. However, as shown in the  
4 Engineering Assessment, included in the Application as Exhibit D, available information  
5 suggests that Raven Run No. 2 and No. 3 were constructed in approximately 1885,  
6 Ringtown No. 5 was constructed in approximately 1914, and Ringtown No. 6 was  
7 constructed in approximately 1920.

8  
9 **[BEGIN CONFIDENTIAL]**



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**Q. Please explain the major categories of dam safety.**

A. The compliance criteria for dam safety focuses on the hydraulic and structural performance of dams under various loading conditions. The hydraulic performance is measured by the capacity of the spillway to carry the outflow from the Spillway Design Flood (“SDF”). In Pennsylvania, the SDF for High Hazard Dams is typically the Probable Maximum Flood (“PMF”). The PMF is the flood that may be expected from the most severe combination of critical meteorological and hydrologic conditions that are reasonably possible in the drainage basin. For the hydraulic capacity of the dam to be in compliance, the outflow of

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1 the SDF must pass through the spillway(s) and/or over the dam without impacting the  
2 structural performance.

3 The structural stability performance criteria of the dam depends on the construction  
4 method. The four (4) MABS dams are earthen embankment dams, which means the factor  
5 of safety against slope failure must meet compliance criteria under various loading  
6 conditions. Slope stability is a function of the material properties of the embankment and  
7 foundation soils, the geometry of the slope, and the impact of the presence of groundwater  
8 in the embankment known as the phreatic surface.

9 Dams in Pennsylvania are classified in accordance with size and hazard potential.  
10 Size is determined by either storage or height, whichever results in the higher category.  
11 Hazard potential is determined by loss of life or economic loss, whichever results in a  
12 higher category.<sup>1</sup>

13 SIZE CATEGORY

<u><i>Category</i></u>	<u><i>Impoundment Storage (Acre Feet)</i></u>	<u><i>Dam Height (Feet)</i></u>
A	Equal to or greater than 50,000	Equal to or greater than 100
B	Less than 50,000 but greater than 1000	Less than 100 but greater than 40
C	Equal to or less than 1000	Equal to or less than 40

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<sup>1</sup> See 25 Pa. Code § 105.91.

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1

HAZARD POTENTIAL CATEGORY

<u>Category</u>	<u>Population at Risk</u>	<u>Economic Loss</u>
1	Substantial (Numerous homes or small businesses or a large business or school).	Excessive such as extensive residential, commercial, or agricultural damage, or substantial public inconvenience.
2	Few (A small number of homes or small businesses.)	Appreciable such as limited residential, commercial, or agricultural damage, or moderate public inconvenience.
3	None expected (no permanent structures for human habitation or employment.)	Significant damage to private or public property and short duration public inconvenience such as damage to storage facilities or loss of critical stream crossings.
4	None expected (no permanent structures for human habitation or employment.)	Minimal damage to private or public property and no significant public inconvenience.

2

Hazard potential categories 1 and 2 dams are considered High Hazard dams. Hazard

3

potential category 3 dams are considered Significant Hazard dams. Hazard potential

4

category 4 dams are considered Low Hazard dams.

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**Q. Have you reviewed the Inspection Reports for the MABS dams?**

7

A. Yes.

8

9

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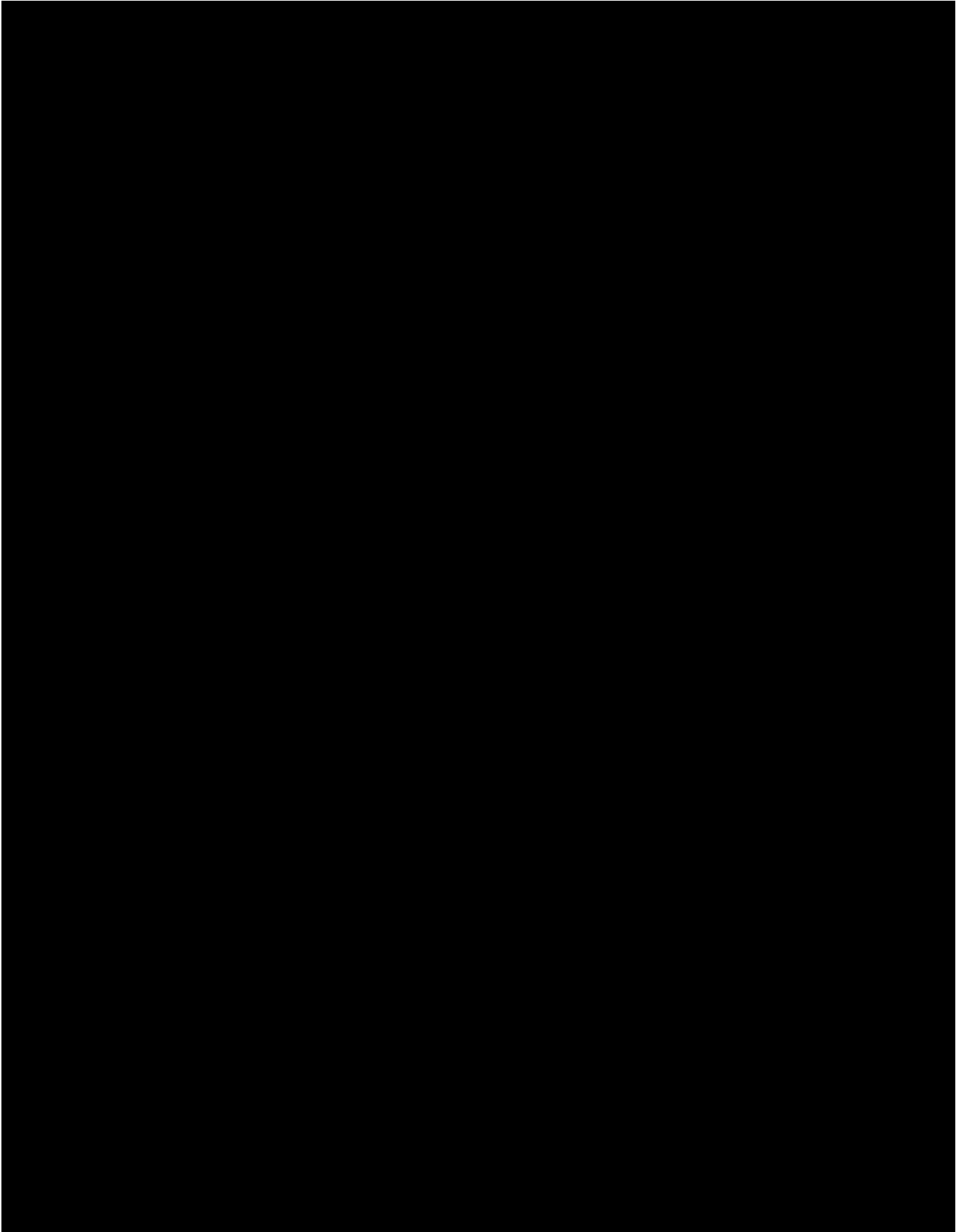
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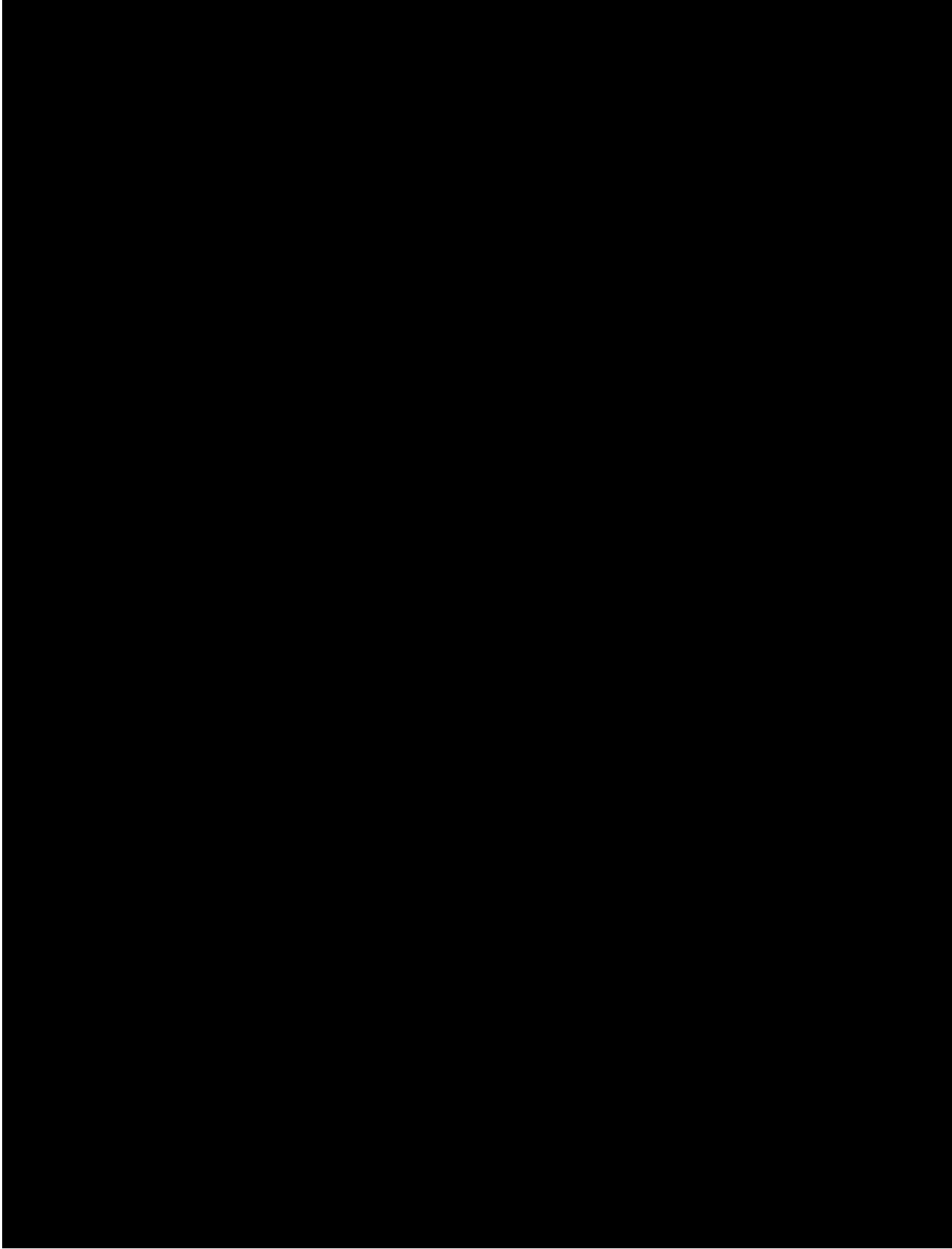
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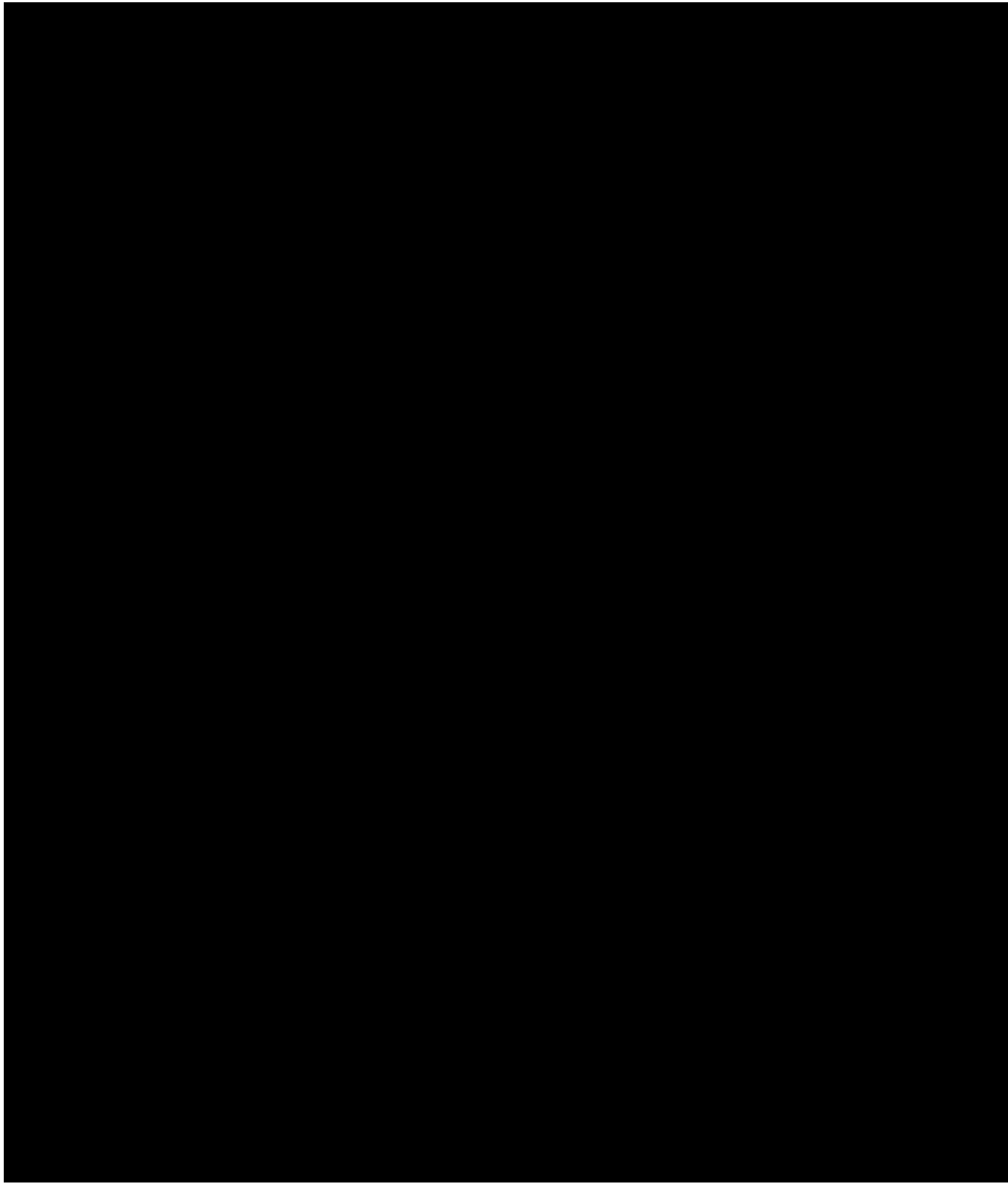
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<sup>2</sup> See <https://www.dep.pa.gov/Business/Water/Waterways/DamSafety/Pages/Probable-Maximum-Precipitation-Study-.aspx>

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1 [END CONFIDENTIAL]

2

3 **Q. Have you discussed this plan with DEP?**

4 A. No. Aqua is not currently the owner of the System and will work with DEP after the  
5 transaction closes to address these non-compliance issues and prioritized using risk-  
6 informed decision making.

7

8 **Q. Should the absence of the dam permit delay acceptance of this filing or its processing**  
9 **before the Commission?**

10 A. No. Based on my understanding, the Commission performs a review prior to initial  
11 acceptance of a 1329 application. Here, the permit for Raven Run No. 2 was never issued.  
12 related to the dam are not available. This should not hold up the acceptance of the filing.  
13 Rather, the Company has described its plan to obtain the permit after it becomes the owner  
14 of the System.

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16 **III. AQUA'S POLICIES AND PROCEDURES FOR DAM OPERATION**

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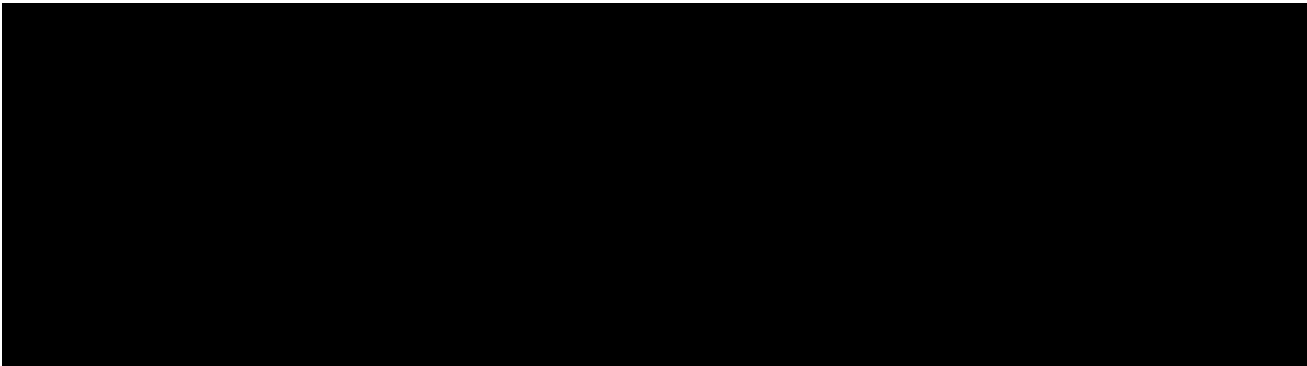
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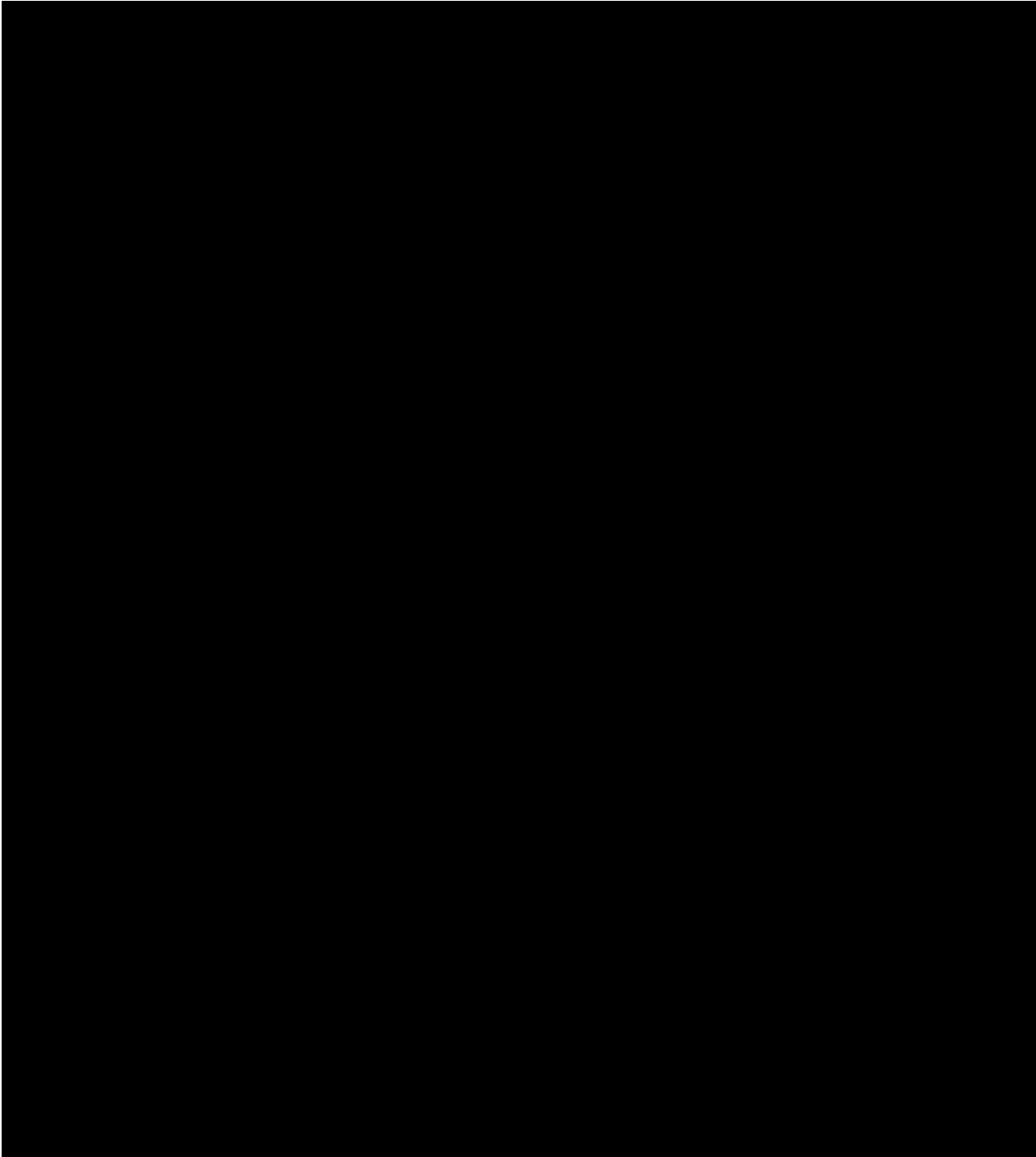
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[END CONFIDENTIAL]

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1 **Q. Please summarize how Aqua’s ownership of the MABS system and its dams will**  
2 **provide public benefits.**

3 A. Aqua is aware of the impacts that dams and reservoirs have on the public and the  
4 environment. Aqua prioritizes projects that improve overall risk, of which, public impact  
5 is a major function. The MABS dams will come under Aqua’s procedures for dam  
6 inspection and maintenance, Aqua will be able to complete needed analyses of the dams,  
7 and Aqua will be able to apply for the dam permit that was never issued upon its ownership  
8 of the System. All of these are benefits of Aqua’s ownership, and provide overall benefits  
9 to the public.

10

11 **IV. CONCLUSION**

12 **Q. Does this conclude your Direct Testimony?**

13 A. Yes, it does. However, I reserve the right to supplement my Direct Testimony as additional  
14 issues and facts arise during the course of this proceeding.