Commonwealth of Virginia

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

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Stefanie K. Taillon
Secretary of Natural and Historic Resources

Michael S. Rolband, PE, PWD, PWS Emeritus
Director

VWP Individual Permit Number 24-2717
Effective Date: Month DD, YYYY
Expiration Date: Month DD, YYYY

VIRGINIA WATER PROTECTION PERMIT ISSUED PURSUANT TO THE STATE WATER CONTROL LAW AND SECTION 401 OF THE CLEAN WATER ACT

In compliance with § 401 of the Clean Water Act, as amended (33 USC § 1341) and the State Water Control Law and regulations adopted pursuant thereto, the Department has determined that there is a reasonable assurance that this VWP permit, if complied with, will protect instream beneficial uses, will not violate applicable water quality standards, and will not cause or contribute to a significant impairment of state waters or fish and wildlife resources. In issuing this VWP permit, the Department has not taken into consideration the structural stability of any proposed activities.

Permittee: Virginia Electric and Power Company
d/b/a Dominion Energy

Facility: Altavista Power Station

Facility Address: 104 Wood Lane, Altavista, Virginia, 24157

Activity Location: The intake is located adjacent to the Altavista Power Station along the northwestern bank of the Roanoke River at River Mile 127.4.

Activity Description: The permit authorizes the continued operation of an existing intake structure located on the Roanoke River. The withdrawal is used for non-contact cooling purposes and service water for the Altavista Power Station. Other uses are not authorized by this permit. Permitted activities shall be conducted as described in the Joint Permit Application received on November 21, 2024, and supplemental materials, revisions and clarifications received.

The permittee's authorized water withdrawal shall not exceed:

2.98 million gallons per day
45.2 million gallons per month
438 million gallons per year

The permitted activity shall be in accordance with this Permit Cover Page, Part I - Special Conditions, and Part II - General Conditions.

_____ _____

Bryant Thomas
Interim Director, Water Division

Date

Part I – Special Conditions

A. Authorized Activities

1. This permit authorizes the operation of a surface water intake withdrawing from the Roanoke River for the purposes of non-contact cooling during power generation at the Altavista Power Station.

2. The permittee shall conduct authorized activities as described in the Joint Permit Application and supplemental materials, revisions, and clarifications. Any changes to the authorized activities that affect permitted areas shall be submitted to the Department immediately upon determination that changes are necessary, and Department approval shall be required prior to implementing the changes.

3. The permittee shall notify the Department of any changes in authorized impacts to surface waters or of any modifications of the intake structure. Department approval shall be required prior to implementing the changes. Any additional impacts, modifications, or changes shall be subject to individual permit review or modification of this permit.

B. Permit Term

1. This permit is valid for fifteen (15) years from the date of issuance. A new permit may be necessary for the continuance of the authorized activities, including water withdrawals, or any permit requirement that has not been completed, including compensation provisions.

2. The permittee shall submit a new permit application at least 270 calendar days prior to the expiration of this permit if reissuance will be requested. A complete permit application is due in accordance with 9VAC25-210-65**.**

C. Standard Project Conditions

1. This permit does not constitute, convey, or imply authority to any permittee to unlawfully or incidentally take any threatened or endangered species that is protected by Virginia laws or regulations, pursuant to § 3.2-1000 through -1011; § 29.1-563 through -570; and 4VAC15-20 *et seq*.

2. The activities authorized by this permit shall be executed in such a manner that any impacts to beneficial uses are minimized. As defined in § 62.1-44.3 of the Code of Virginia, "beneficial use" means both instream and offstream uses. Instream beneficial uses include, but are not limited to, the protection of fish and wildlife habitat, maintenance of waste assimilation, recreation, navigation, and cultural and aesthetic values. The preservation of instream flows for purposes of the protection of navigation, maintenance of waste assimilation capacity, the protection of fish and wildlife resources and habitat, recreation, cultural and aesthetic values is an instream beneficial use of Virginia's waters. Offstream beneficial uses include, but are not limited to, domestic (including public water supply), agricultural uses, electric power generation, commercial, and industrial uses.

3. No activity shall substantially disrupt the movement of aquatic life indigenous to the water body, including those species which normally migrate through the area, unless the primary purpose of the activity is to impound water.

4. Flows downstream of the project area shall be maintained to protect all uses.

5. No activity shall cause more than minimal adverse effect on navigation, and no activity shall block more than half of the width of the stream at any given time.

6. The activity shall not impede the passage of normal or expected high flows, and any associated structure shall withstand expected high flows.

7. All required notifications, reports, and submittals shall include project name and permit number and be submitted electronically to **withdrawal.permitting@deq.virginia.gov.** Alternatively, they can be mailed to the office stated below, unless otherwise directed in writing by the Department subsequent to the issuance of this permit: Department of Environmental Quality, Attn: Compliance Program Manager, Office of Water Permitting, P.O. Box 1105, Richmond VA 23218.

8. All reports required by this permit and other information requested by the Department shall be signed by the permittee or a person acting in the permittee's behalf, with the authority to bind the permittee. A person is a duly authorized representative only if *both* criteria below are met. If a representative authorization is no longer valid because of a change in responsibility for the overall operation of the facility, a new authorization shall be immediately submitted to the Department.

   a. The authorization is made in writing by the permittee.

   b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, superintendent, or position of equivalent responsibility. A duly authorized representative may thus be either a named individual or any individual occupying a named position.

9. All submittals shall contain the following signed certification statement:

   "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

10. Any fish kills or spills of fuels or oils shall be reported to the Department immediately upon discovery at 540-562-6700 or https://portal.deq.virginia.gov/v2/prep/search. If the Department cannot be reached, the spill or fish kill shall be reported to the Virginia Department of Emergency Management (VDEM) at 1-800-468-8892 or the National Response Center (NRC) at 1-800-424-8802. Any spill of oil as defined in § 62.1-44.34:14 of the Code of Virginia that is less than 25

gallons and that reaches, or that is expected to reach, land only is not reportable, if recorded per § 62.1-44.34:19.2 of the Code of Virginia and if properly cleaned up.

11. The Department shall be notified in writing within 24 hours or as soon as possible on the next business day when potential environmentally threatening conditions are encountered which require debris removal or involve potentially toxic substances. Measures to remove the obstruction, material, or toxic substance or to change the location of any structure are prohibited until approved by the Department.

12. Virginia Water Quality Standards shall not be violated in any surface waters as a result of the project activities pursuant to 9VAC25-260.

D. Surface Water Withdrawals

1. Surface water withdrawn from the Roanoke River and authorized under this permit is to be used for the purposes of cooling and servicing plant operations at the Altavista Power Station.

2. The withdrawal of water from the Roanoke shall not exceed the following:

    a. A maximum daily withdrawal of 2.98 million gallons per day (Mgal/d);

    b. A maximum monthly withdrawal of 45.2 million gallons (Mgal); and

    c. A maximum annual withdrawal of 438 million gallons (Mgal).

3. At no time shall the volume of water withdrawn from the Roanoke River be greater than one percent (1%) of the previous day's provisional streamflow as measured by the procedures outlined in Part I. D. 4.

4. The permittee shall estimate the previous day's streamflow in units of million gallons per day (Mgal/d) on a daily basis by monitoring the stream flow gages detailed herein and by applying the equation:

    "Qintake = Qgage x 1.01 x 0.646", where:

    a. Qintake = estimated streamflow at the intake;

    b. Qgage = the previous day's provisional mean daily flow at the Stream Gaging Station No. 02060500 (Roanoke River at Altavista, VA);

    c. 1 = is the adjustment factor for drainage area; drainage area at the intake divided by the drainage area at the gaging station [1,800 mi^2/ 1,782 mi^2 = 1.01]; and

    d. 0.646 is the conversion factor for cfs to Mgal/d.

5. The permittee shall submit a Drought Management Plan to the Department for review within 180 days (DATE) of permit issuance. Any revisions to the approved plan shall be submitted to the Department for review prior to implementing the change. The plan shall include, at a minimum, the following:

a. Development of drought stages including when and how each stage will be implemented; and

b. Description of the conservation measures to be implemented during each drought stage.

6. When a drought emergency is declared by the Commonwealth of Virginia in the Roanoke Drought Evaluation Region or by Campbell County in accordance with the County's Drought Management Ordinance, the permittee shall implement either the provisions directed by the Commonwealth, the Drought Management Ordinance, or the mandatory conservation measures as detailed in *Attachment B* of this permit, whichever is the most restrictive. The permittee shall be responsible for determining when drought emergencies are declared. The permittee shall retain records documenting that mandatory conservation measures were implemented during declared drought emergencies.

7. The permittee shall conduct and submit a bathymetric survey of the holding pond to the Department prior to the expiration of this permit (DATE).

E. Water Withdrawal Monitoring, Recordation and Reporting Conditions

1. Within 120 days (DATE) of the issuance of this permit, the permittee shall submit a Monitoring and Operations Plan for Department review. The Plan should specifically address the following:

   a. Procedures for operating the intake to ensure compliance with all water withdrawal conditions of this permit;

   b. Procedures for estimating streamflow in accordance with Part I. D. 4 including the time of day that the estimate will be made;

   c. A procedure for estimating the previous day's flow at the intake location in the event that Gage No. 02060500 (Roanoke River at Altavista, VA) is damaged, disabled, or discontinued;

   d. Procedures for recording withdrawals as well as all other monitoring and reporting requirements in Part I. E. 2. and E. 5., including a sample of the reporting form or table that will be used.

2. On each day that pumping occurs, the permittee must monitor and record the following, for each pump:

   a. Date and time;

   b. Total amount of water withdrawn each day;

   c. The provisional stream flow in cubic feet per second (cfs) as measured at the Gage No. 02060500 (Roanoke River at Altavista, VA) and the required flow-by as measured in cfs and Mgal/d.

d. Amount of water purchased from the Town of Altavista as measured in Mgal/d.

3. The permittee shall have installed, and shall operate, a gaging device or methodology before commencing withdrawal and shall operate the device or methodology routinely thereafter. Such gaging device or methodology shall produce volume or flow measurements within plus or minus 10% of truth. A defective gaging device must be repaired or replaced within 60 days. A defective meter is not grounds for not reporting the withdrawals. During any period when a gaging device is defective, generally accepted engineering practice shall be used to estimate withdrawals or flow and the period during which the meter was defective must be clearly identified in the report.

4. The permittee shall report any withdrawal not in compliance with Parts I. D. 2. or I. D. 3. by the fifth (5th) day of the month following the month in which the withdrawal occurred. Failure to report may result in compliance or enforcement activities.

5. The permittee shall submit a water withdrawal monitoring report to the Department semi-annually. The semi-annual monitoring period shall be as follows: January through June and July through December. The daily records shall be tabulated by month. The report shall be submitted to the Department by February 10th and August 10th of every year within the permit term. Submittal of the report may be reported electronically reporting, or another form determined to be acceptable by the Department. The report shall include the following information:

   a. The permittee's name and address;

   b. The permit number;

   c. The source (s) from which water is withdrawn;

   d. The location (latitude and longitude) of each point of water withdrawal;

   e. Information listed in Part I. E. 2;

   f. The volume (million gallons) of water withdrawn each day;

   g. The cumulative volume (million gallons) of water withdrawn each month and for the calendar year;

   h. The maximum daily volume (million gallons per day) of water withdrawn as calculated on the last day of the monitoring period;

   i. In the last report for the calendar year, the largest single day withdrawal volume (million gallons) that occurred in the year and the month in which it occurred;

   j. The method of measuring each withdrawal;

   k. A summary of the dates on which the flowby in the Roanoke River did not meet the required volumes as determined in accordance with Part I. D. 3.; and

l. If during a semi-annual reporting period a drought emergency is declared, the report shall include a summary of mandatory conservation measures implemented during the drought event.

6. Water withdrawal monitoring and reporting activities shall comply with this section, Part I. C., and Part II General Conditions. All records and information that result from the monitoring and reporting activities required by this permit, including any records of maintenance activities to the withdrawal system, shall be retained for the life of the permit. This period of retention shall be extended automatically during the course of any unresolved litigation regarding the regulated activity or as requested by the Department.

Part II – General Conditions

A. Duty to Comply

The permittee shall comply with all conditions and limitations of the VWP permit. Nothing in this chapter shall be construed to relieve the permittee of the duty to comply with all applicable federal and state statutes, regulations, toxic standards, and prohibitions. Any VWP permit violation or noncompliance is a violation of the Clean Water Act and State Water Control Law and is grounds for enforcement action, VWP permit termination, VWP permit revocation, VWP permit modification, or denial of an application for a VWP permit extension or reissuance.

Nothing in this VWP permit shall be construed to relieve the permittee from civil and criminal penalties for noncompliance.

B. Duty to Cease or Confine Activity

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the activity for which a VWP permit has been granted in order to maintain compliance with the conditions of the VWP permit.

C. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any impacts in violation of the VWP permit that may have a reasonable likelihood of adversely affecting human health or the environment.

D. VWP Permit Actions

A VWP permit may be modified in whole or in part, revoked and reissued, extended, transferred, or terminated in accordance with 9VAC25-210-180 of the Virginia Administrative Code.

1. During the drafting and authorization of a permit modification, only those conditions to be modified shall be addressed with preparing a draft modified permit. VWP permit terms and conditions of the existing permit shall remain in full force and effect during the modification of the permit.

2. This VWP permit may be modified upon the request of the permittee or upon department initiative when any of the following developments occur:

    a. When new information becomes available about the project or activity covered by the VWP permit, including project additions or alterations, that was not available at VWP permit issuance and would have justified the application of different VWP permit conditions at the time of VWP permit issuance;

    b. When a change is made in the promulgated standards or regulations on which the VWP permit was based;

c. When changes occur that are subject to "reopener clauses" in the VWP permit; or

d. When developments applicable to surface water withdrawals occur as specified in 9VAC25-210-380 of the Virginia Administrative Code.

3. When this VWP permit authorizes surface water withdrawals, it may be modified when any of the following developments occur:

a. When the department determines that minimum instream flow levels resulting directly from the permittee's withdrawal of surface water are detrimental to the instream beneficial use, existing at the time of permit issuance, and the withdrawal of surface water should be subject to further net limitations or when an area is declared a surface water management area pursuant to §§ 62.1-242 through 62.1-253 of the Code of Virginia, during the term of the VWP permit.

b. Significant changes to the location of the surface water withdrawal system are proposed such that the Department of Environmental Quality determines a new review is warranted due to the potential effect of the surface water withdrawal to existing beneficial uses of the new location.

c. Changes to the permitted project or the surface water withdrawal, including increasing the storage capacity for the surface water withdrawal, that propose an increase in the maximum permitted withdrawal volumes or rate of withdrawal or that cause more than a minimal change to the instream flow requirements with potential to result in a detrimental effect to existing beneficial uses.

d. A revision to the purpose of the surface water withdrawal that proposes to include a new use or uses that were not identified in the permit application or a modification of the existing authorized use or uses such that the use description in the permit application and permit is no longer applicable. Examples of uses include, but are not limited to agricultural irrigation, golf course irrigation, public water supply, manufacturing, and electricity generation.

4. When the permittee has submitted a timely and complete application for reissuance of an existing VWP individual permit, but through no fault of the permittee, the department does not reissue or reissue with conditions a VWP individual permit or the department does not provide notice of its tentative decision to deny the application before an existing VWP individual permit expires, the conditions of the expiring VWP individual permit shall be administratively continued in full force and effect until the effective date of a reissued permit or the date on which the department denies the application. Timely application shall be a minimum of 180 days for an individual permit or a minimum of 270 days for an individual permit for a surface water withdrawal, unless otherwise specified in the existing permit.

5. Any permittee desiring to continue a previously permitted activity after the expiration date of this VWP permit shall apply for and obtain a new permit or, if applicable, shall request an extension in accordance with 9VAC25-210-180 of the Virginia Administrative Code. Any permittee with an effective VWP permit for an activity that is expected to continue after the expiration date of the

VWP permit, without any change in the activity authorized by the VWP permit other than as may be allowed under 9VAC25-210-180, shall submit written notification requesting an extension. The permittee must file the request 90 days prior to the expiration date of the VWP permit. VWP permit modifications shall not be used to extend the term of a VWP permit beyond 15 years from the date of original issuance. When a permit term, other than that of an Emergency Virginia Water Protection Permit, is less than 15 years, an extension of the permit terms and conditions may be granted in accordance with 9VAC25-210-180. Emergency Virginia Water Protection Permits shall not exceed a duration of one year or shall expire upon the issuance of a regular Virginia Water Protection Permit, whichever comes first.

6. This VWP permit may be transferred to a new permittee only by modification to reflect the transfer, by revoking and reissuing the permit, or by automatic transfer. Automatic transfer to a new permittee shall occur if the current permittee: a) Notifies the department of the proposed transfer of the permit and provides a written agreement between the current and proposed permittees containing the date of transfer of VWP permit responsibility, authorization, and liability to the new permittee; and b) the department does not within 15 days notify the existing permittee of its intent to modify the VWP permit.

7. After notice and opportunity for a formal hearing pursuant to § 62.1-44.15:02 of the Code of Virginia, a VWP permit can be terminated for cause. Reasons for termination for cause are as follows:

   a. Noncompliance by the permittee with any condition of the VWP permit;

   b. The permittee's failure in the application or during the VWP permit process to disclose fully all relevant facts or the permittee's misrepresentation of any relevant facts at any time;

   c. The permittee's violation of a special or judicial order;

   d. A determination by the department that the permitted activity endangers human health or the environment and can be regulated to acceptable levels by VWP permit modification or termination;

   e. A change in any condition that requires either a temporary or permanent reduction or elimination of any activity controlled by the VWP permit; and

   f. A determination that the permitted activity has ceased and that the compensation for unavoidable adverse impacts has been successfully completed.

8. The department may terminate this permit without cause when the permittee is no longer a legal entity due to death, dissolution, or when a company is no longer authorized to conduct business in the Commonwealth. The termination shall be effective 30 days after notice of the proposed termination is sent to the last known address of the permittee or registered agent, unless the permittee objects within that time. If the permittee does object during that period, the department shall follow the applicable procedures for termination under § 62.1-44.15:25 of the Code of Virginia and 9VAC25-230 of the Virginia Administrative Code.

9. This VWP permit may be terminated by consent, as initiated by the permittee. The permittee shall submit a request for termination by consent within 30 days of completing or canceling all permitted activities and all required compensatory mitigation requirements. When submitted for project completion, the request for termination by consent shall constitute a notice of project completion. The director may accept this termination on behalf of the department. The permittee shall submit the following information:

    a. Name, mailing address, and telephone number;

    b. Name and location of the activity;

    c. The VWP permit number; and

    d. One of the following certifications:

        i. For project completion: "I certify under penalty of law that all activities and any required compensatory mitigation authorized by a VWP permit have been completed. I understand that by submitting this notice of termination that I am no longer authorized to perform activities in surface waters in accordance with the VWP permit, and that performing activities in surface waters is unlawful where the activity is not authorized by a VWP permit, unless otherwise excluded from obtaining a permit. I also understand that the submittal of this notice does not release me from liability for any violations of this VWP permit."

        ii. For project cancellation: "I certify under penalty of law that the activities and any required compensatory mitigation authorized by this VWP permit will not occur. I understand that by submitting this notice of termination that I am no longer authorized to perform activities in surface waters in accordance with the VWP permit, and that performing activities in surface waters is unlawful where the activity is not authorized by a VWP permit, unless otherwise excluded from obtaining a permit. I also understand that the submittal of this notice does not release me from liability for any violations of this VWP permit, nor does it allow me to resume the permitted activities without reapplication and issuance of another permit."

        iii. For events beyond permittee control, the permittee shall provide a detailed explanation of the events, to be approved by DEQ, and the following certification statement: "I certify under penalty of law that the activities or the required compensatory mitigation authorized by this VWP permit have changed as the result of events beyond my control (see attached). I understand that by submitting this notice of termination that I am no longer authorized to perform activities in surface waters in accordance with the VWP permit, and that performing activities in surface waters is unlawful where the activity is not authorized by a VWP permit, unless otherwise excluded from obtaining a permit. I also understand that the submittal of this notice does not release me from liability for any violations of this VWP permit, nor does it allow me to resume the permitted activities without reapplication and issuance of another permit.

E. Inspection and Entry

Upon presentation of credentials, the permittee shall allow the department or any duly authorized agent of the department, at reasonable times and under reasonable circumstances, to conduct the actions listed in this section. For the purpose of this section, the time for inspection shall be deemed reasonable during regular business hours. Nothing contained herein shall make an inspection time unreasonable during an emergency.

1. Enter upon any permittee's property, public or private, and have access to, inspect and copy any records that must be kept as part of the VWP permit conditions;

2. Inspect any facilities, operations or practices (including monitoring and control equipment) regulated or required under the VWP permit; and

3. Sample or monitor any substance, parameter, or activity for the purpose of ensuring compliance with the conditions of the VWP permit or as otherwise authorized by law.

F. Duty to Provide Information

The department may request (i) such plans, specifications, and other pertinent information as may be necessary to determine the effect of an applicant's discharge on the quality of state waters or (ii) such other information as may be necessary to accomplish the purposes of this chapter. Any owner, permittee, or person applying for a VWP permit or general permit coverage shall provide the information requested by the department.

G. Monitoring and Records Requirements

1. Monitoring of parameters, other than pollutants, shall be conducted according to approved analytical methods as specified in the VWP permit. Analysis of pollutants will be conducted according to 40 CFR Part 136 (2017), Guidelines Establishing Test Procedures for the Analysis of Pollutants.

2. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

3. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart or electronic recordings for continuous monitoring instrumentation, copies of all reports required by the VWP permit, and records of all data used to complete the application for the VWP permit, for a period of at least three years from the date of permit expiration. This period may be extended by request of the department at any time.

4. Records of monitoring information shall include:

    a. The date, exact place and time of sampling or measurements;

b. The name of the individuals who performed the sampling or measurements;

c. The date and time the analyses were performed;

d. The name of the individuals who performed the analyses;

e. The analytical techniques or methods supporting the information such as observations, readings, calculations and bench data used;

f. The results of such analyses; and

g. Chain of custody documentation.

H. Property rights

The issuance of a VWP permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize injury to private property or any invasion of personal rights or any infringement of federal, state or local laws or regulations.

I. Reopener

This VWP permit may be reopened for the purpose of modifying the conditions of the VWP permit to meet new regulatory standards duly adopted by the board. Cause for reopening VWP permits includes, but is not limited to when the circumstances on which the previous VWP permit was based have materially and substantially changed, or special studies conducted by the board or the permittee show material and substantial change, since the time the VWP permit was issued and thereby constitute cause for VWP permit modification or revocation and reissuance.

J. Compliance with State and Federal Law

As to the permitted activity(ies), compliance with a VWP permit constitutes compliance with the VWP permit requirements of the Law and regulations.

K. Severability

The provisions of this VWP permit are severable.

L. Oil and Hazardous Substance Liability

Nothing in this VWP permit shall be construed to preclude the institution of legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under § 311 of the Clean Water Act or §§ 62.1-44.34:14 through 62.1-44.34:23 of the State Water Control Law.

M. Unauthorized Discharge of Pollutants

Except in compliance with a VWP permit, unless the activity is otherwise exempted or excluded, no person shall dredge, fill, or discharge any pollutant into, or adjacent to surface waters; withdraw surface water; otherwise alter the physical, chemical, or biological properties of state waters regulated under this chapter and make them detrimental to the public health, to animal or aquatic life, or to the uses of such waters for domestic or industrial consumption, for recreation, or for other uses; excavate in wetlands; or on or after October 1, 2001, conduct the following activities in a wetland:

1. New activities to cause draining that significantly alters or degrades existing wetland acreage or functions;

2. Filling or dumping; or

3. Permanent flooding or impounding.

PERMIT DECISION RATIONALE
Virginia Water Protection Individual Permit No. 24-2717
Altavista Power Station, Campbell County, Virginia

This document provides the pertinent information concerning the legal basis, scientific rationale, and justification for the reissuance of the VWP permit listed below. The Department of Environmental Quality (Department or DEQ) has reviewed the application for the Virginia Water Protection (VWP) Individual Permit Number 24-2717 and has determined that the project qualifies for an individual permit. Based on the information provided in the application and in compliance with (§ 401 of the Clean Water Act as amended (33 USC 1341 et seq.)) the State Water Control Law and regulations, the Department has determined that there is a reasonable assurance that the activity authorized by this permit will protect instream beneficial uses, will not violate applicable water quality standards, and will not cause or contribute to significant impairment of state waters or fish and wildlife resources, provided the permittee complies with all permit conditions. Surface water impacts have been avoided and minimized to the maximum extent practicable.

Approved:

_____
Bryant Thomas
Interim Director, Water Division

_____
Date

The following details the application review process and summarizes relevant information for developing the Part I - Special Conditions for permit issuance.

1. Contact Information:

Permittee / Legal Responsible Party

Virginia Electric and Power Company
d/b/a Dominion Energy
Attn: Robert Sauer
600 East Canal Street
Richmond VA 23219
(804) 273-3685
Robert.w.sauer@dominionenergy.com

Facility Name and Address

Altavista Power Station
104 Wood Lane
Altavista VA 24157

Agent Legal Name and Address:

Dominion Energy
Attn: Jennifer Rogers
120 Tredegar Street
Richmond VA 23219
(804) 363-6927
Jennifer.j.rogers@dominionenergy.com

2. JPA Processing Dates:

DEQ Received Application from VMRC:	November 21, 2024
1st Request for Additional Information Sent:	December 6, 2024
Response to 1st Request for Additional Information Received:	January 10, 2025
2nd Request for Additional Information Sent:	January 23, 2025
Response to 2nd Request for Additional Information Received:	February 6, 2025
Application Deemed Complete:	February 20, 2025
Coordination with State and Federal Agencies:	February 21, 2025
Notice of Application sent to Local Government(s):	February 25, 2025
Notice of Application sent to Riparian Landowners:	February 26, 2025
Notice of Application sent to Tribal Nations:	February 27,2025
Permit Fee Marked Paid:	March 13, 2025
Draft Permit Package Issued:	July 25, 2025
Public Notice Published:	Date
Received Verification of Publication:	Date
End of 30-Day Public Comment Period:	Date
Date of Public Meeting or Hearing [If applicable]:	Date

3. Project Location:

The Altavista Power Station is located at 104 Wood Lane Road in the northeastern portion of the Town of Altavista in Campbell County, Virginia. The intake is located adjacent to the power station along the northwestern bank of the Roanoke (Staunton) River at River Mile 127.4, approximately 12 river miles downstream of the Leesville Lake Dam (covered under VWP Permit No. 24-1547 and FERC License P-2210).

City/County: Campbell County
Waterbody: Roanoke River
Basin: Roanoke
Subbasin: Middle Roanoke
Section: 5
Class: IV
Special Standards: PWS
HUC: 030101011305
U.S.G.S. Quadrangle: Altavista

4. Project Description:

Virginia Electric and Power Company (Dominion Power or Dominion) is the owner and operator of the existing Altavista Power Station (Altavista or Station or Project). The Station is a single-unit renewable bio-mass fueled, base load electric generating facility that utilizes withdrawals from the Roanoke River for the purposes of cooling and servicing normal plant operations. 87% of water withdrawn is used for non-contact cooling purposes and the remainder of the water is used as service water for various station uses including, but not limited to, flue gas desulfurization, fire protection, and dust suppression.

No new facility structures, modification to existing structures, or jurisdictional impacts are proposed as part of the application.

<u>Existing Water Supply System</u>

The Altavista Power Station was originally built to burn coal and began commercial operation in 1992 but was converted to a renewable biomass fired power station in 2011-2012 and resumed station operations in 2013. Portions of the intake structure collapsed during a storm event in 2015, and a temporary intake was installed in 2016. The temporary intake was removed when construction of the new permanent intake structure in the Roanoke River was completed and operational in 2019. The Station is a single unit, 51-megawatt (MW) renewable biomass fueled, base load electric generating facility that uses a mechanical draft cooling water tower to recirculate condenser cooling water. The principal fuel source is slash wood.

The existing water supply system includes an intake in the Roanoke River, an onsite water holding pond, a cooling tower, a pumping station, and air burst lines. The intake consists of two (2) buried 12” diameter high density polyethylene pipes which extend from the pumping station to approximately 210 feet from the streambank in the Roanoke River. The intake contains two (2) 36” diameter half cylindrical wedgewire screens with 1.0-millimeter slot openings and a through-slot velocity of 0.25 feet per second, meeting current intake standards recommended by the Department of Wildlife Resources (DWR) protective of aquatic species. The invert elevation of the buried intake pipes is 496.4 feet (NAVD88), and the intake screens sit on a concrete pad at an elevation of 499.4 feet (NAVD88) with the tops of the screens at an elevation of 500.5 feet (NAVD88). A 4” diameter air burst line is connected to each intake

screen and extends to the pumping station. The Roanoke River is approximately 180 feet wide at the intake location.

The pumping station contains two (2) Sulzer 120" vertical turbine pumps each rated at 1,200 gallons per minute. Water from both pumps at the intake structure are combined into a single pipe which empties into the water holding pond. The holding pond is a raised earthen embankment that is roughly rectangular, measuring approximately 1,200 feet in crest length and five (5) to ten (10) feet in crest width. Maximum height of the embankment is approximately 15 feet. Storage capacity of the holding pond is approximately 3.5 million gallons and has a surface area of 1.7 acres. Water withdrawn from the holding pond is pumped from the basin by two (2) cooling tower pumps with flow controlled by the level in the cooling tower basin.

The Station's circulating water system is a closed-loop system, meaning the water is recycled and reused in the steam turbine condensers. While the number of cycles of concentration (COC) can change depending on operational conditions, the cooling tower is currently operating at ten (10) to fifteen (15) COCs and provides a cooling water flow reduction of at least 98% compared to a once-through system. The purpose of the circulating water is to supply cooling water to the main condenser, the generator air coolers, the lube oil coolers, and the cooling water system. The cooling tower make-up flow is controlled by a level controller in the Distributed Control System (DCS) and a control valve in the make-up water supply line and can be adjusted by the operator of the DCS.

There is one (1) mechanical draft cooling tower at the Station, which contains five (5) cells equipped with fans to induce the required draft and three (3) pumps in the tower basin to recirculate the cooling water to the condenser. Each pump has a design flow of 21,000 gallons per minute. There are also two (2) 500 gallon per minute auxiliary cooling water pumps that take water from the cooling tower basin to provide cooling water to the plant's auxiliary coolers. The cooling water is returned to the cooling tower via the circulating water pipe. The heat transferred to the circulating water in the condenser is rejected to the atmosphere by the evaporation process, no water is used for contact cooling. Evaporation does not carry away any solids in the water such as mud, silt, or dissolved solids in the cooling process, so it is necessary to continuously drain some of the circulating water to prevent a build-up of solids, called blowdown. The conductivity of the water is measured to determine the blowdown required to reduce the concentration of dissolved solids. The Station is able to adjust the ratio of potable water to raw water to maintain the concentrations of blowdown total suspended solids within the discharge permit limits. Wastewater is returned to the Roanoke River from an outfall on site (covered under VPDES Permit VA0083402).

Permit History

The Department issued VWP Permit 89-0868 on September 14, 2010, authorizing the continued operation of the existing intake withdrawing surface water from the Roanoke River for the purposes of serving plant operations at the Altavista Power Station. The permit authorized the maximum daily withdrawal of no more than 2.86 million gallons and the maximum annual withdrawal of no more than 522 million gallons.

The first minor modification was issued January 4, 2011 to allow modification to the monitoring and reporting language requirements. The second minor modification was issued on March 6, 2018 to allow adjustments to special condition language related to reporting fuel and oil spills. The third minor modification was issued on October 11, 2018, authorizing the installation of a new intake due to the previous permanent intake structure being damaged in a storm event. The construction work for the Intake Structure Replacement Project was completed on September 30, 2019. This project included demolition and removal of the damaged intake and raw water lines.

5. Project Purpose & Need:

Purpose of Water Uses and Basis of Need

Pursuant to 9VAC25-210-360, the applicant shall demonstrate to the satisfaction of the Department that the project meets an established need for water to meet the project purpose. The project purpose is for the continued operation of the existing water withdrawal system utilizing withdrawals from the Roanoke River for the purposes of cooling and servicing plant operations at the Altavista Power Station.

Dominion Energy provides electricity as part of a Regional Transmission Organization (RTO). The RTO managing the region in which Dominion provides electricity is called the Pennsylvania-New Jersey-Maryland Interconnection (PJM). PJM is responsible for coordinating the flow of electricity on the grid throughout its territory which consists of parts of 13 states and the District of Colombia. The Dominion Energy Zone is the southernmost portion of the PJM RTO and covers parts of Virginia and North Carolina. As a producer of electricity within the PJM RTO, the Altavista Power Station supports electricity demand throughout the RTO by providing power to the grid to meet both real-time and projected electricity demand loads across the RTO. When and how the Station operates is a function of regional electricity demands and the availability of other electricity generating units throughout the RTO. With projected electricity demand increasing across the PJM RTO, Dominion expects that the Station will be called upon more often to meet regional electricity demands.

Water Need: Demand Projection

The Department permits water withdrawals to meet the justified water demands over the 15-year permit term. The Department evaluated the applicant's demand projections from the Joint Permit Application (JPA) and supplemental information provided. In addition, Dominion has a current contract with the Town of Altavista (Town) requiring Dominion to purchase a minimum of 75,000 gallons per day from the Town from April 1 to October 31 of each calendar year. Dominion has no obligation to purchase the minimum from the Town from September 1 to May 31 of each calendar year.

Water withdrawal rates and volume for the Station are functions of generating loads, weather conditions, and permit limitations. The Station is normally used for base load generation, but there are times when the Station does not receive a dispatch for generation due to economic reasons. Water withdrawals are generally slightly higher from May to September and December to February compared to the rest of the year. Downtime due to planned outages usually occur in March through April and October through November of each year.

The Altavista Power Station maintains a 3.5-million-gallon capacity holding pond on site. The holding pond is able to provide enough water for three (3) days of Station operation at maximum rate capacity, resulting in an average daily demand of approximately 1.2 Mgal/d. The maximum daily demand of 2.98 Mgal/d was calculated by multiplying the average daily withdrawal of 1.2 Mgal/d by the calculated peak day factor of 2.48. The peak day factor was calculated by dividing the maximum day withdrawal from 2014-2024 of 1.459 Mgal by the average daily withdrawal from 2014-2024 of 0.589 Mgal. Monthly maximum demand was calculated using data from peak day withdrawals from 2014-2024, 1.459 Mgal/d, multiplied by 31 days, equaling a maximum monthly withdrawal of 45.2 Mgal per month. The maximum annual demand was calculated by multiplying the average day of 1.2 Mgal/d by 365 days, equaling 438 Mgal per year.

In addition, Dominion is requesting the 2.98 Mgal/d maximum permit limit to meet the Station's needs for storage to supply make-up and service water to support full capacity operation, while also accounting for loss due to evaporation and maintenance requirements. In addition, Dominion is estimating that the holding pond will need to be drained, dredged of accumulated sediments, and refilled during the upcoming permit term. Additionally, there are some days when withdrawals from the Roanoke River are not possible due to minimum instream flow conditions not being met or high turbidity. When river withdrawals can resume, the Station has a need to pump the maximum rates permitted to refill the holding pond.

Operation of the Station over the permit term is projected to increase due to increasing electricity demand. Based on past operation and future projected operation, Dominion states the most recent 10-year period is not reflective of future operation. Projected increases in future operation is supported by Dominion Energy's most recent public Integrated Resources Plan (IRP), which projects the Station to be in operation through 2039. According to the 2024 IRP, PJM projects that power demand will continue growing at unprecedented levels in coming decades and power demand within the Dominion Energy Zone is forecasted to grow 5.5 percent (%) annually for the next decade and to double by 2039. Due to the projected increase in future operation, the Station is expecting to be available to operate at full capacity 365 days a year.

Department staff evaluated the applicant's projections and finished water production to recent historic reporting of raw water withdrawals (See Table 1). The reported 12-year (2013-2024) average annual withdrawal is 137 Mgal/year, with an average daily demand of 0.375 Mgal/d. The reported 5-year (2020-2024) average annual withdrawal is 173 Mgal/year, with an average daily demand of 0.47 Mgal/d.

Table 1: Historical Annual Withdrawal Data from DEQ CEDS Database

Reporting Year	**Total Annual Withdrawal (million gallons/year)**
2024	140.676
2023	185.327
2022	195.827
2021	172.203
2020	170.865
2019	135.189
2018	65.334
2017	26.613
2016	93.804
2015	188.629
2014	159.424
2013	112.977

The Department evaluated the applicant's demand using the daily average volume of 1.2 Mgal/d projected for Year 2040.

- Average Daily: 1.2 x 1.05 = 1.26 Mgal/d
  - System losses (5 percent)
- Peak (maximum) day: 1.26 x 2.48 = 3.12 Mgal/d
  - Peak Day Factor (2.48) obtained from application.

- Maximum Monthly: 1.26 x 1.9 x 31 = 74.21 million gallons (Mgal)
  - Peak Month Factor (1.9) obtained from historical records.
- Maximum Annual: 1.26 x 365= 459.90 Mgal

Note: The peak day factor of 2.48 from the application materials was used in DEQ's evaluation. The month peak factor of 1.9 was calculated by dividing the maximum monthly usage by the average usage for the last five years (2020-2024) of the applicant's withdrawal data for the existing facility.

The requested and calculated water demand volumes for the intake on the Roanoke River are summarized in the below table:

Table 2: Requested, Calculated, and Recommended Demand Volumes

	Requested Water Demand through Year 2040	Department Calculated Demand	Recommended Withdrawal Limits
Average Daily Volume (Mgal/d)	1.2	1.26	NA
Peak Day Volume (Mgal/d)	2.98	3.12	2.98
Maximum Monthly Volume (Mgal)	45.2	74.21	45.2
Maximum Annual Volume (Mgal)	438	459.9	438

The volumes in the recommended withdrawal limits column are based on the permit term and will be used as the water need to set limits in this permit.

6. Alternatives for Surface Water Withdrawals Evaluated to Meet the Water Need (Establishing the Least Environmentally Damaging Practicable Alternative):

Pursuant to 9VAC25-210-360 3 C, the applicant is required to evaluate each alternative to surface water withdrawals for the purpose of establishing the least environmentally damaging practicable alternative. The applicant considered the following alternatives as part of their application:

1. Re-use of treated wastewater
2. Collection of stormwater
3. Purchases from the local public water supply

The following criteria was used in the evaluation of the available alternatives:

- Demonstration of purpose and need
- Alternative's availability to Dominion
- Interconnectivity of water supply systems
- Cost
- Safe yields
- Possible impacts to State and Federal lists of Threatened and Endangered Species
- Impacts to wetlands/streams
- Effects on instream flow
- Water Quality considerations

Re-use of treated wastewater and collection of stormwater are not practicable due to site logistics, lack of re-use regulations, logistics of transport and treatment of wastewater, and concerns from upstream users for diverting of the treated wastewater.

A connection to the Town of Altavista's (Town) public water supply as a backup source for the Station was established in 2016. The connection is utilized when the Station is unable to pump raw water due to turbidity, weather conditions, or low flow events. The contract between Dominion and the Town of Altavista allows Dominion to purchase up to 1.6 Mgal/d from the Town but requires Dominion to purchase a minimum of 75,000 gallons per day from the Town from April 1 to October 31 of each calendar year. Dominion has no obligation to purchase the minimum from the Town from September 1 to May 31 of each calendar year. Water in excess of 1.6 Mgal/d may be purchased at the discretion of the Town. The Town reserves the right to restrict Town water usage during drought conditions or other emergencies.

Dominion proposes the continuation of existing Station operations, including the interconnection with the Town, as the preferred and least environmentally damaging practicable alternative.

7. Evaluating Water Withdrawal Volumes Based on Beneficial Use Impacts and Flow-by/Release Requirements:

§ 62.1- 11 E establishes that the "right to the use of water or to the flow of water in or from any natural stream, lake or other watercourse in this Commonwealth is and shall be limited to such water as may reasonably be required for the beneficial use of the public to be served." The Department is directed by § 62.1-44.15:22 to establish limits that preserve instream flow "to the volume of water that may be withdrawn as a part of the permitted activity and conditions necessary to protect beneficial uses." Pursuant to 9VAC25-210-370 B 3, the Department shall take into consideration the combined effect on the hydrologic regime of the surface water within an affected stream reach due to consumptive water uses in the development of instream flow conditions for new withdrawals. Further, 9VAC25-210-370 D 1 requires a determination that the amount of the surface water withdrawal is limited to the amount of water that can be put to beneficial use.

<u>Department Recommended Withdrawal Limitations</u>

The permit limits surface water withdrawals to the volume justified based upon the application materials submitted and modeling analyses. The Department concluded that the water demand and statement of need is reasonable and has been adequately justified by the application through the information submitted in the VWP permit application process. Based upon this information, the permit proposes the following limits on the withdrawal volumes:

- Maximum Daily: 2.98 Mgal/d
- Maximum Monthly: 45.2 Mgal
- Maximum Annual: 438 Mgal

Based on the material provided in the JPA, as supplemented by the applicant, and the applicable permit term for the proposed withdrawal to be put to beneficial use, the Department has determined the proposed withdrawal volumes for the project, as limited in the permit, comply with applicable standards identified in 9VAC25-210-370 D 1.

Return Flow / Consumptive Use

Various operational and maintenance activities result in wastewater that is treated and returned to the Roanoke River via Outfall 001 covered under VPDES Permit VA0083402. There are four (4) additional outfalls within project boundaries which discharge to the stormwater system.

Dominion estimates consumptive use at 83.25 percent. Using the current maximum daily withdrawal of 2.86 Mgal/d, consumptive use is estimated at 2.38 Mgal/d with return flows estimated at 0.48 Mgal/d.

Cumulative Impact Analysis

A cumulative impact analysis was conducted by the Department on the withdrawal volumes requested, flow-by requirements, the current water supply system, and cumulative impacts to existing beneficial uses and existing water users. Based upon the results of the analysis, the Department determined the proposed project as limited in the permit, will protect existing beneficial uses while meeting the applicant's purpose and need.

The full Department staff modeling analysis can be found in Attachment A.

Flow-by and Release Requirements

Dominion proposes to continue implementing the minimum instream flow (MIF) requirements, as previously required under VWP Permit No. 89-0868, and withdrawal restrictions in order to ensure adequate downstream flows in the Roanoke River while also serving the Project's purpose.

Flows in the Roanoke River are, in part, dependent on the upstream discharge from the Leesville Dam, as authorized under VWP Permit No. 24-1547. Station personnel measure and monitor streamflow data at the USGS gaging station 02060500 (Roanoke River at Altavista), which is approximately 1.75 miles upstream from the Station's intake. To verify releases made from the SML Hydroelectric Project, Altavista Power Station personnel gather information from operators at the Smith Mountain Lake Hydroelectric facility daily, including the minimum average hourly release and the and daily average release at the Leesville Dam. The previous day's minimum average hourly release from the Leesville Dam is recorded on a daily basis on the Altavista Power Station's river reading log, along with the Roanoke River readings from the USGS gage. Water withdrawals made for the Station are dependent on water demand, withdrawal restrictions based on MIF requirements, water losses due to evaporation, and system losses. Under VWP Permit No. 89-0868, water withdrawal and MIF restrictions are as follows:

1. When releases from the Smith Mountain Lake Hydroelectric Project are greater or equal to 650 cfs, the following provisions shall apply:

    a. No withdrawals are authorized during the Striped Bass Spawning Flow Augmentation Period* if instream flows measured at USGS gaging station 02060500 (Roanoke River at Altavista) are less than 858 cubic feet per second (cfs).

    b. No withdrawals are authorized outside of the Striped Bass Spawning Flow Augmentation Period* if instream flows measured at USGS gaging station 02060500 (Roanoke River at Altavista) are less than 720 cfs.

2. When releases from the Smith Mountain Lake Hydroelectric Project are less than 650 cfs, the following provisions shall apply:

    a. No withdrawals are authorized October 1st through May 31st if instream flows at the USGS gaging station 02060500 (Roanoke River at Altavista) are less than 360 cfs.

    b. No withdrawals are authorized June 1st through September 30th if instream flows at the USGS gaging station 02060500 (Roanoke River at Altavista) are less than 420 cfs.

*The Striped Bass Spawning Flow Augmentation Period in any year extends from March 1st through May 31st unless the Virginia Department of Wildlife Resources (DWR) provides a written determination to the permittee that the spawning period ended prior to May 31st.

Through the modeling analysis conducted by Department staff (See Attachment A), and in consultation with DWR, a proposed 99% flow-by scenario was developed in lieu of the above proposal to continue the current MIF and withdrawal restrictions. The 99% flowby scenario meets the facilities demands under all scenarios while maintaining and ensuring protection of beneficial uses, including aquatic resources. The modeling of the current flow-by rules within VWP No. 89-0868 showed the possibility that flows at the Altavista Power Station could drop below the current MIF thresholds for short periods of time under specific conditions. In addition, the Smith Mountain Hydroelectric Project is approximately 12 river miles upstream from the Altavista Power Station and the Station's current operating conditions do not account for additional inputs or users in between the Leesville Lake Dam and the Altavista Power Station intake. Modeling staff recommends utilizing a flow-by of 99% with flows monitored at the USGS gaging station 020604500 (Roanoke River at Altavista). The 99% flow-by, allowing withdrawal of up to 1% of streamflow, will enhance water availability for the Altavista Power Station and better captures instream flow inputs or withdrawals between the Altavista Power station intake location and Smith Mountain Lake Dam. The 99% flowby allows for simplified operational conditions while ensuring protection of instream beneficial uses, including during striped bass spawning periods. In addition, these operating conditions will enhance water availability for the Altavista Power Station intake and will be more resilient to increases in demand in other parts of the watershed that are not influenced by the Smith Mountain Hydroelectric Project.

For the full modeling analysis, see Attachment A: Department Modeling Summary.

8. Water Supply Plan Review:

The Department is required by § 62.1-44.15:20 C to give full consideration to any relevant information contained in the state water supply plan described in Subsection A of § 62.1-44.38:1. The Region 2000 Local Government Council Regional Water Supply Plan was developed in accordance with the Water Supply Planning Regulation 9VAC25-780. These plans provided the basis of review for the proposed project.

Altavista Power Station is not included in the Region 2000 Local Government Council Regional Water Supply Plan (Plan). Water demand projections for the facility were not included in the Plan and could not be considered in the evaluation of the permit request. The Plan states that existing sources for the Town of Altavista were not projected to meet demands through 2060.

9. Impacts to State Waters:

There are no jurisdictional impacts associated with the permit renewal.

Water quality impacts are expected to be temporary and minimal provided the permittee abides by the conditions of the permit. A loss of state waters shall occur. However, the impacts have been avoided and minimized to the greatest extent practicable.

10. Compensation for Unavoidable Impacts:

No compensation is required as there are no impacts proposed.

11. Site Inspection:

A site visit was not deemed necessary by the Department.

12. Relevant Regulatory Agency Comments:

As required by § 62.1-44.15:20 C and the Joint Permit Application review process, the Department consulted the appropriate state regulatory agencies and coordinated with various federal regulatory agencies. Agencies had 45 days to submit written comments on the proposed permit application after notification by the Department. All written agency comments received were given full consideration and addressed in the VWP individual permit Part I - Special Conditions.

Summary of State Agency Comments and Actions

By email dated February 21, 2025, comments were requested from the following state agencies: Virginia Department of Wildlife Resources (DWR), Virginia Department of Conservation and Recreation (DCR), Virginia Marine Resources Commission (VMRC) and the Virginia Department of Health (VDH). Failure to provide comments within 45 calendar days of the Department request for comments infers that the agency has no comments on the project activities. Comments received by agencies are summarized below.

Virginia Department of Health (VDH)

VDH provided comments on March 7, 2025. The comments are summarized below:

- VDH commented the nearest surface water intake is for the Town of Clarksville located on Kerr Reservoir more than 70 miles downstream of the Project. VDH stated there are no groundwater public water systems located within one mile of the Project.

- VDH stated there will be no apparent impacts to waterworks as a result of this permit issuance.

Virginia Department of Conservation and Recreation (DCR)

DCR provided comments on April 1, 2025. The comments are summarized below:

- DCR searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare,

threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

- According to DCR's predicted suitable habitat modeling and review by a DCR biologist, there is a potential for Roanoke Logperch to occur in the Roanoke River within the project area if suitable habitat exists on site.

- The Roanoke Logperch is endemic to the Roanoke and Chowan River drainages in Virginia and inhabits medium and large, warm and usually clear rivers with sandy to boulder spotted bottoms. DCR notes that this species is classified as endangered by the United States Fish and Wildlife Service (USFWS) and the Virginia Department of Wildlife Resources (DWR).

- The Roanoke Logperch is threatened by channelization, siltation, impoundment, pollution, and de-watering activities.

- In addition, the Roanoke River has been designated by DWR as a "Threatened and Endangered Species Water" for the Roanoke Logperch. Due to the legal status of the Roanoke Logperch, DCR recommends coordination with the US Fish and Wildlife Service and DWR, Virginia's regulatory authority for the management and protection of this species to ensure compliance with protected species legislation.

- Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

Staff Actions/Responses are summarized below:

- *DEQ invited DWR to comment on the proposed project on February 21, 2025. No comments were received.*

- *DEQ recommends the permittee initiate coordination with the USFWS to ensure the Project is in compliance with protected species legislation.*

Summary of Federal Agency Comments and Actions

By email dated February 21, 2025, comments were requested from the U.S. Army Corps of Engineers (USACE). No comments were received.

Summary of Tribal Nations Comments:

The Department issued a Notice of Proposed Project Letter on February 27, 2025, to the following recognized Tribal Nations: Chickahominy Tribal Nation Eastern Division, Chickahominy Tribal Nation, Monacan Tribal Nation, Nansemond Tribal Nation, Pamunkey Tribal Nation, Rappahannock Tribal Nation, and the Upper Mattaponi Tribal Nation. No comments were requested or received.

13. Public Involvement during Application Process:

Pre-Application

A pre-application meeting was not held or required by VWP Permit Program regulations.

Riparian Landowner Notification

The Department notified riparian landowners located within one-half mile downstream of the intake by letter dated February 26, 2025. No responses were requested or received.

Local Government Notification

The Department notified the Campbell County Administrator and the Altavista Town Manager of the Joint Permit Application via email on February 25, 2025. No responses were requested or received.

14. Public Comments received during Comment Period: AND/OR
15. Changes in Permit Part I - Special Conditions Due to Public Comments:

The public notice was published in Name of Newspaper on DATE. The public comment period ran from DATE (*day of publication*) through DATE.

OR

[No public comments were received during the public comment period. Therefore, no changes have been made to the permit conditions.]

If comments are received, summarize. See 10-2001(fact sheet in template folder) for an example.

16. Special Conditions Summary Description:

The following conditions were developed to protect instream beneficial uses, to ensure compliance with applicable water quality standards, to prevent significant impairment of state waters or fish and wildlife resources, and to provide for no net loss of wetland acreage and function through compensatory mitigation and success monitoring and reporting.

Section A Authorized Activities

No. 1 addresses the activities authorized by this permit.
No. 2 states that the authorized activities shall be conducted in accordance with the application materials and any subsequent materials received during the application process.
No. 3 requires the applicant to notify DEQ of any changes to the authorized activities or of new activities which require a VWP permit.

Section B Permit Term

Nos. 1 and 2 addresses the permit term and re-issuance process to ensure that all permit conditions are completed.

Section C Standard Project Conditions

No. 1 ensures no unlawful or incidental take of any threatened or endangered species.
No. 2 addresses the requirement for the minimization of adverse impacts to instream beneficial uses.
No. 3 ensures that the project will be executed in a manner that limits the disruption of the movement of aquatic life.
No. 4 ensures that downstream flows will be maintained to protect both instream and off-stream beneficial uses.
No. 5 ensures the minimization of adverse effects on navigation.
No. 6 ensures the passage of high flows.
Nos. 7 through 11 set forth all submittal requirements concerning reporting, compliance items, construction, monitoring, compensation, and restoration as required by current law and regulations.
No. 12 prohibits the violation of Water Quality Standards in surface waters as a result of project activities.

Section D Surface Water Withdrawals

No. 1 states the use of the water withdrawal is for cooling and servicing plant operations at the Altavista Power Station.
No. 2 establishes the water withdrawal limit for the intake on the Roanoke River.
No. 3 states that the volume of water withdrawn from the Roanoke River shall not be greater than one percent (1%) of the previous day's provisional flow.
No. 4 states the method that should be used to determine the previous day's streamflow.
No. 5 requires the permittee to submit a Drought Management Plan.
No. 6 requires conservation measures to protect instream flows during drought events.
No. 7 requires the permittee to conduct a bathymetric survey of the holding pond.

Section E Water Withdrawal Monitoring, Recordation and Reporting Conditions

No. 1 requires submission of a Monitoring and Operations Plan.
Nos. 2 through 6 establish monitoring and reporting activities and procedures.

16. General Conditions:

General Conditions are applied to all VWP individual permits, as stated in the VWP Permit Program regulation.

17. General Standard:

This project may result in minimal, temporary impacts to beneficial uses related to the propagation and growth of aquatic life as defined in the General Standard. Provided the permittee abides by the conditions of the permit, no substances shall enter state waters in concentrations, amounts or combinations that would contravene established standards or interfere with beneficial uses or are inimical or harmful to human, animal, plant, or aquatic life.

18. DEQ Finds That:

- The proposed activity is consistent with the provisions of the Clean Water Act and State Water Control Law and will protect beneficial uses.

- The amount of the surface water withdrawal is limited to the amount of water that can be put to beneficial use.
- The proposed permit addresses avoidance and minimization of surface water impacts to the maximum extent practicable.
- Based on the size and location of the surface water withdrawal, the withdrawal is not likely to have a detrimental impact on existing instream or offstream uses.
- The effect of the impact will not cause or contribute to a significant impairment of state waters or fish and wildlife resources; adverse impacts on other existing beneficial users; or a violation of water quality standards.
- The proposed permit conditions address no net loss of wetland acreage and function through compensatory mitigation.
- This permit is proposed to prevent unpermitted impacts.
- The permit reflects the required consultation with and full consideration of the written recommendations of VMRC, VDH, VDACS, DCR and DWR.

DEQ recommends VWP Individual Permit Number 24-2717 be issued as proposed.

Attachment A- Department Modeling Summary

Cumulative Impact Analysis for Full Permit Run - Roanoke River @ Altavista Power intake

05/29/2025

1. Project Introduction

The Dominion - Altavista Power Station operates an intake on the Roanoke River (Altavista). Wastewater return flows are returned to the river near the point of removal. The intake is modeled as a direct stream withdrawal, with a 3.5-million-gallon (MG) / 10 acre-feet (acft) storage reservoir. Historically, the facility has used between roughly 50-300 million gallons per year (MGY), with demands ranging between 140-195 MGY from 2020-2024.

1.1. Location Map

No location map available for this facility model

2. Model Overview and Scenario Descriptions

River Model Description This modeled segment (CBP model segment OR4_8120_7890) simulates the Roanoke River (Altavista) at the location of USGS gage 01660400. The total drainage area at this location is approximately 1810.1 square miles. Long term flows at this point in the river average over 1800 cfs, however, historical droughts have yielded single day flows below 150 cfs, but since the establishment and operation of Smith Mountain Lake (SML), low flows are maintained above 400 cfs under all but drought emergency conditions. A mix of withdrawals exist in the watershed, including municipal and manufacturing withdrawals that operate year-round, and extensive agricultural withdrawals that are concentrated in the months June-September. Model low-flow calibration in this segment of the Roanoke watershed is strong, particularly during extreme drought.

Facility & Intake Model Description: The Altavista power facility is simulated as withdrawing water from the Roanoke River and storing that water in the 10.7 acft impoundment. Because the impoundment is small relative to demands (approximately 3 days storage at maximum annual demand), operations are largely dependent on access to the Roanoke River withdrawals.

The following model scenarios were simulated in order to determine the most effective means of meeting the project need and all other in-stream beneficial uses:

- **Current Permit VWP 89-0868** (VWP 89-0868) - This scenario simulates the existing permit with an average diversion of 1.4 MGD (522 MGY). The Smith Mountain Lake/Leesville Lake project has a predictable pattern of low-flow releases which are the basis for permit flow-bys at Altavista. When releases from the Smith Mountain Lake are greater or equal to 650 cubic feet per second cfs, monthly minimum instream flows (MIFs) are:

Month	MIF
1	720
5	858
6	720
9	720
10	720
12	720

When releases from the Smith Mountain Lake are less than 650 cfs, monthly MIFs are:

Month	MIF
1	360
5	360
6	420
9	360
10	360
12	360

For the purpose of this simulation, the Striped Bass Spawning Flow Augmentation Period extends from March 1st through May 31st in all years. While the spawning period can be terminated earlier due to notification from the Department of Wildlife Resources, the likelihood of triggering this condition is assumed to be small, though this may result in a small over-estimation of demand reductions at the Altavista intake.

- **Proposed Permit VWP 24-2717** (VWP 24-2717) - This scenario simulates the proposed permit with an average diversion of 1.4 MGD (522 MGY) and a flow-by of 99% of the previous days flow as measured at the Altavista USGS gage. This scenario was developed to address a potential concern revealed by modeling of the current VWP permit flow-by rules, which showed that flows at Altavista could dip below the current MIF thresholds for short periods of time under specific conditions. The release schedule from Smith Mountain Lake seldom permits releases to drop below 400 cfs only during the months of November-February, when a 375 release is permissible under a tier 3 drought emergency (tiers described in SML permit VWP 24-1457). Goose Creek supplies a majority of the inflows to the Roanoke River between SML and the Altavista gage and has never recorded a flow lower than 27 cfs between Nov-February. So, in theory, the minimum Nov-Feb flow at Altavista is 402 cfs, and therefore, withdrawals are assured at Altavista during drought conditions when the flow-by is 400 cfs. However, in winter 2013, sub-370 cfs flows at Altavista persisted for 16 days, during a time when the Altavista power plant was not in operation (Note: SML operating rules were adjusted to reduce the likelihood of a recurrence). Also, in the summer months, observed flows from Goose Creek have been as low as 8 cfs, and with a minimum summer release at SML of 400 cfs, this leaves a potential 12 cfs deficit below the current permit flow-by of 420 cfs, and has no room to accommodate potential stream bank exfiltration and consumptive demand increases in Goose Creek or the Roanoke River between SML and the gage. Additionally, during periods when SML releases exceed 650 cfs, flows from Goose Creek and the watershed between SML and Altavista must supply between 70-150 cfs, in order to meet the Altavista power MIFs in the current VWP permit. During flash drought conditions and/or when soil moisture and baseflow recharge are low, the flows from Goose Creek regularly drop below 70 cfs. During these times, availability permitted in VWP 89-0868 could drop below demand. A 99% flow-by which permits withdrawal of up to 1% of streamflow, would enable the maximum daily pumping rate of 2.86 MGD at flows as low as 442 cfs, and would allow the average requested demand of 1.2 MGD at

flows as low as 186 cfs. Maximum sustained demands during the summer months are estimated to be approximately 2.0 mgd (based on historical use patterns) which means that streamflows as low as 320 cfs could supply demands and still meet a 99% flow-by.

2.1. Table of Modeled Demand Limits:

Description	VWP 89-0868	VWP 24-2717
Average Daily Volume (MGD)	1.43	1.26
Peak Day Volume (MGD)	2.86	2.86
Maximum Annual Volume (MG)	522.00	459.90

Historical Intake Flows and Drought Flow Indicators

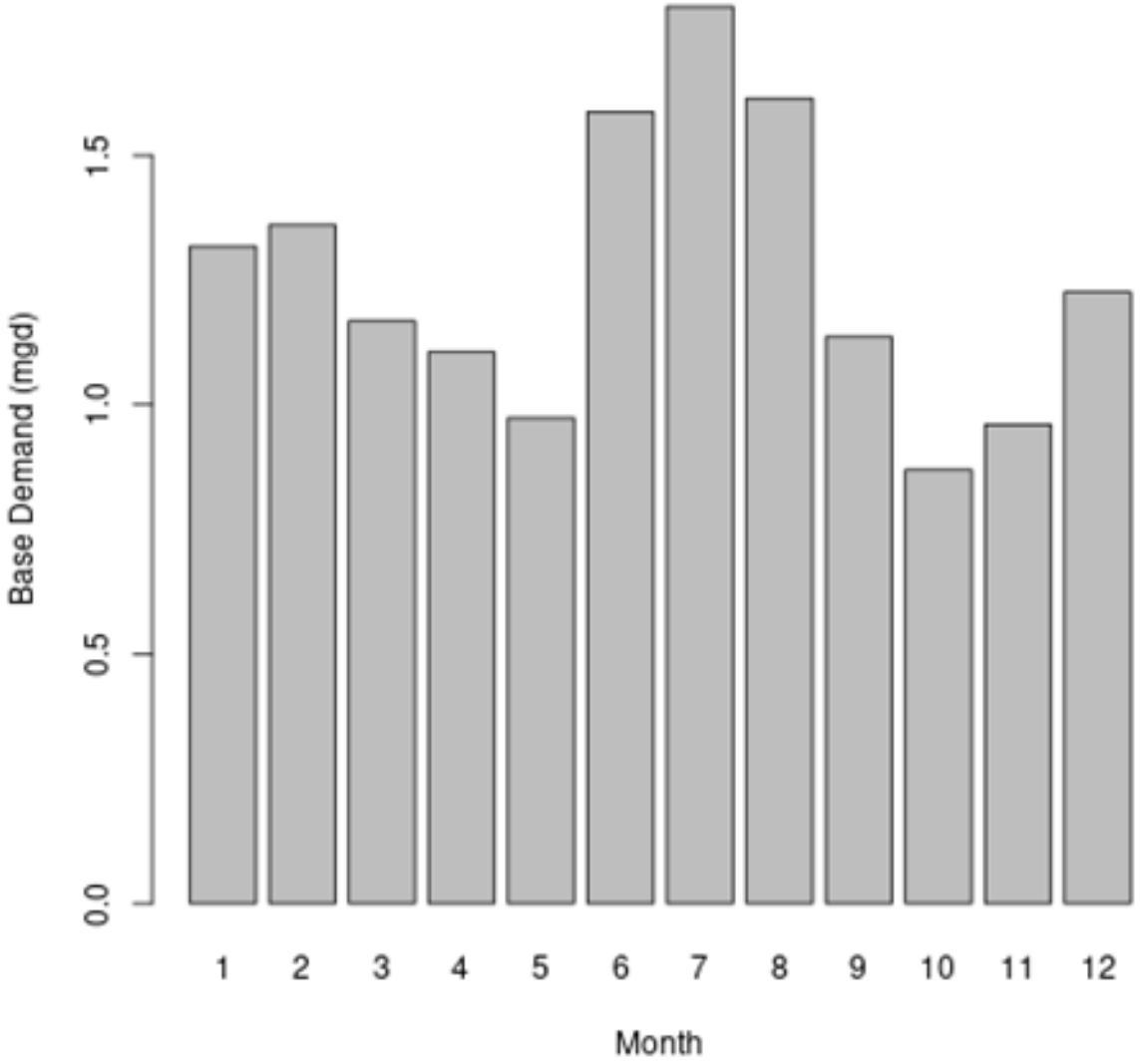
The VAHydro model is used to estimate flows at the project intake, including the impact of all cumulative withdrawals and discharges upstream of the intake location and are presented in Table 1. The Virginia Drought Assessment and Response Plan[1] employs non-exceedance flow percentiles as indicators of drought conditions at particular stream-gaging stations used to monitor drought conditions. Representative daily streamflows above the 25th percentile for return flow frequency represent normal conditions with respect to drought. Representative daily streamflows between the 10th and 25th percentiles represent drought watch conditions. Representative daily streamflows between the 5th and 10th percentiles represent drought warning conditions. Representative daily streamflows below the 5th percentile indicate drought emergency conditions.

Month	Min	5%	10%	25%	30%	50%	Mean
Jan	460.6	662.3	757.9	944.5	1,096.0	1,832.7	2,296.3
Feb	535.3	698.6	816.8	1,140.3	1,322.4	2,022.7	2,481.2
Mar	538.4	754.6	895.9	1,469.3	1,661.8	2,308.6	2,860.7
Apr	585.4	959.0	1,119.9	1,258.8	1,375.4	2,019.8	2,735.4
May	629.1	971.8	1,094.4	1,209.3	1,236.3	1,623.2	2,032.2
Jun	484.9	606.8	631.4	727.3	794.4	1,110.3	1,654.6
Jul	440.7	477.4	517.2	546.2	561.3	746.9	1,153.5
Aug	434.9	460.7	477.2	507.6	516.5	628.2	938.6
Sep	429.2	455.6	464.3	485.7	496.7	615.6	1,127.2
Oct	446.5	470.5	484.4	516.2	527.9	657.3	1,319.5
Nov	472.9	506.8	531.3	588.8	618.0	782.4	1,375.9
Dec	451.6	560.9	600.5	687.6	751.3	1,432.1	1,881.2

Table 1: Modeled monthly current flow statistics for Altavista Power in cubic feet per second (cfs). Columns show the minimum (Min), and average (Mean) modeled flow, and a range of non-exceedance flow percentiles, that is, the percent of flows that do *not* exceed the given value. For example, the "10%" states that only 10% of flows in the given month are expected to be less than the indicated value, and therefore, 90% of the flows in that month are expected to be greater than the given value. For example, in the table below the 10% column states that 10% of flows within the month of January would be less than 758 cfs.

[1] Virginia Drought Assessment and Response Plan, developed by the Drought Response Technical Advisory Committee in response to Executive Order #39, March 28, 2003.

2.2. Current Facility Base Demand Before Conservation: Proposed Permit VWP 24-2717



3. Results

3.1. Summary

Presented below are 2 scenarios to examine the alternatives for this permit re-issuance. A summary of how permit rules affect available water for this permit, and how this operation may impact instream beneficial uses, and other downstream water withdrawals is presented.

- **Current Permit VWP 89-0868** - This simulation shows that, despite a small reservoir storage relative to demands, the full permitted demand of 2.9 MGD (4.4 cfs) can be met through the majority of simulated conditions, with the only lengthy interruptions during extreme drought events in 1999 and 2001. Despite chronically low flows during 2002, flows are sustained above the minimum instream flow at the Altavista intake. Similarly, unmet demands are infrequent throughout the simulated period. Nevertheless, the model at this location shows that the greatest risk of unmet demand at the Altavista intake occurs when SML releases are during drought recovery, that is, when releases are >= 650 cfs, triggering the upper tier of Altavista flow-bys, but watershed inflows between Leesville Lake and the Altavista intake (including Goose Creek) remain low. The model simulates this type of occurrence for several short periods of time throughout the simulated period of record. The probabilistic triggers at Smith Mountain Lake will reduce this frequency somewhat, as low releases may persist even after the lake has been refilled. However, recent "flash droughts" in other parts of Virginia give reason for caution, as periods of low-winter recharge, coupled with high air temperatures and low humidity can combine to create rapid return to low base flow conditions after significant storms. Provisions for off-stream storage should be made to support demands at Altavista during this time. There is an average return flow of 0.3 MGD for a net average consumptive use of 1.1 MGD after wastewater treatment. The intake demand represents 3 % of the total watershed consumptive use at this and net consumptive use amounts to 4 % of the total watershed consumptive use at this point in the river.
- **Proposed Permit VWP 24-2717** - This simulation shows that with the 99% flow-by, the full permitted demand of 2.9 MGD (4.4 cfs) can be met through all of simulated conditions. The result is that no period of unmet demands occurs throughout the simulated period. There is an average return flow of 0.3 MGD for a net average consumptive use of 1.1 MGD after wastewater treatment. The intake demand represents 3 % of the total watershed consumptive use at this and net consumptive use amounts to 4 % of the total watershed consumptive use at this point in the river.

3.2. Conclusion

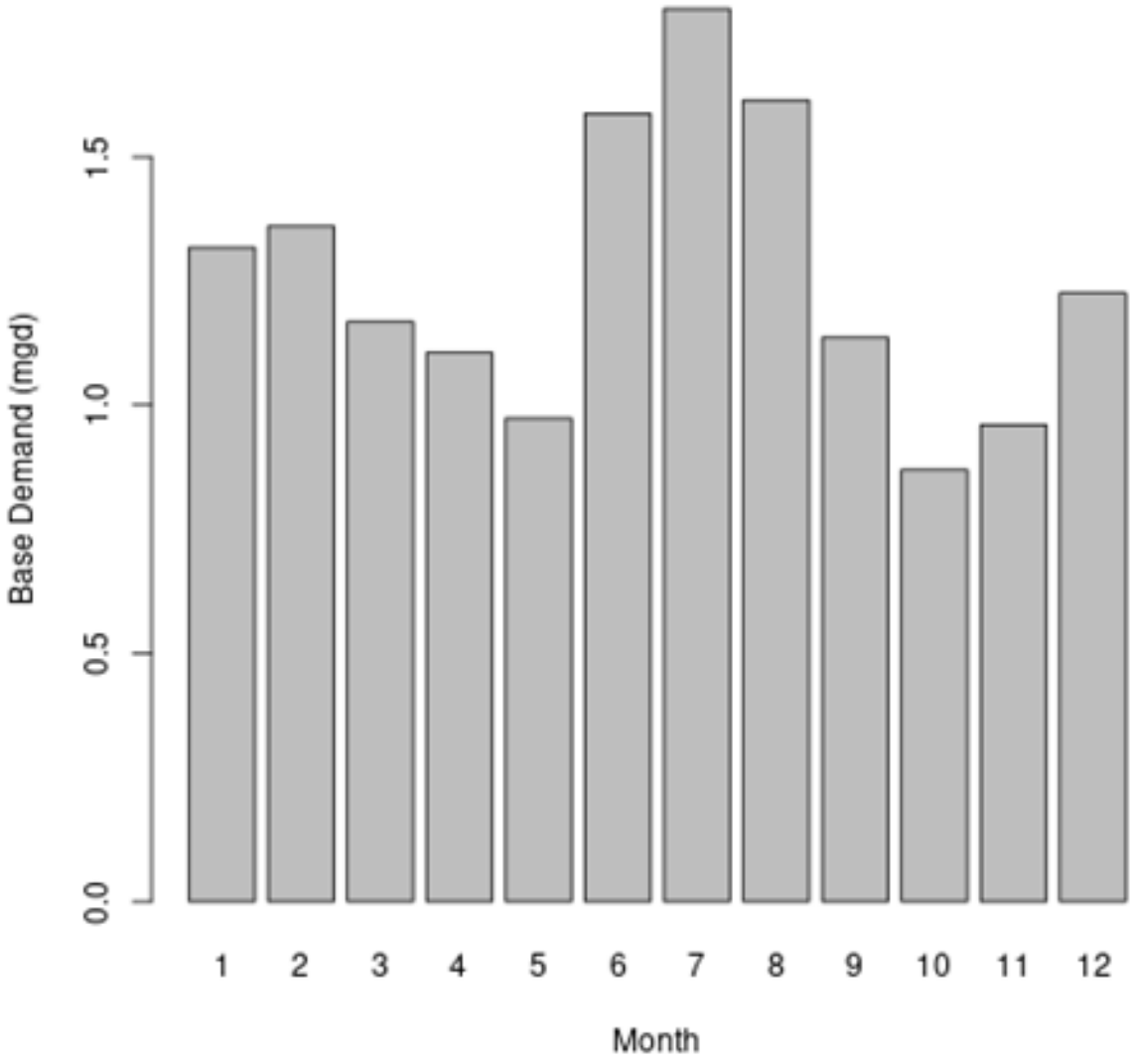
- **Proposed Permit VWP 24-2717** - This proposed scenario, featuring a 99% flow-by, permits all demands to be met in the period simulated. While the JPA states that unmet demands can be met by purchased water from the town of Altavista, since this water also comes from the direct Roanoke River intake, there would be no net benefit to the stream. Also, since there is no MIF at the Town of Altavista additional storage would still be prudent, in the event that some unforeseen drought caused flows to drop below demands for an extended period of time, and the 99% flow-by would not meet full demands, and refill needs. In short, the proposed flowby enhances water availability for this intake, and is more resilient to increases in demand in other parts of the watershed that are not influenced by SML.

3.2.1. Consumptive Use Table for Proposed Scenario

Modeled monthly consumptive use statistics in the Roanoke River (Altavista) in cubic feet per second (cfs). Columns show the modeled non-exceedance flow percentiles and the net % flow change due to cumulative demands for Proposed Permit VWP 24-2717. Simulated demands include all up-stream demands and demands at Altavista Power and all upstream point-source flows. Fields that are marked as 'n/a' indicate that the baseline flow for that time period/percentile was below the model accuracy threshold of 0.1 cfs. Note: Pre and Post data are of different lengths, therefore, comparisons have been made only on overlapping days which may skew the percentile flow values as compared to those that would be calculated from the full time period.

Month	Min	5%	10%	25%	30%	50%	Mean
Jan (Jan%)	460.6 (+54%)	662.3 (+23%)	757.9 (+7%)	944.5 (-23%)	1096 (-21%)	1832.7 (-9%)	2296.3 (-7%)
Feb (Feb%)	535.3 (+6%)	698.6 (-14%)	816.8 (-15%)	1140.3 (-21%)	1322.4 (-17%)	2022.7 (-6%)	2481.2 (-7%)
Mar (Mar%)	538.4 (+13%)	754.6 (-18%)	895.9 (-17%)	1469.3 (-8%)	1661.8 (-6%)	2308.6 (-5%)	2860.7 (-4%)
Apr (Apr%)	585.4 (-22%)	959 (+6%)	1119.9 (+11%)	1258.8 (-10%)	1375.4 (-14%)	2019.8 (-8%)	2735.4 (-3%)
May (May%)	629.1 (+11%)	971.8 (+21%)	1094.4 (+15%)	1209.3 (-4%)	1236.3 (-9%)	1623.2 (-10%)	2032.2 (-5%)
Jun (Jun%)	484.9 (+28%)	606.8 (+1%)	631.4 (-15%)	727.3 (-28%)	794.4 (-25%)	1110.3 (-15%)	1654.6 (-10%)
Jul (Jul%)	440.7 (+51%)	477.4 (+16%)	517.2 (-7%)	546.2 (-24%)	561.3 (-26%)	746.9 (-23%)	1153.5 (-14%)
Aug (Aug%)	434.9 (+102%)	460.7 (+37%)	477.2 (+23%)	507.6 (-10%)	516.5 (-18%)	628.2 (-27%)	938.6 (-11%)
Sep (Sep%)	429.2 (+128%)	455.6 (+42%)	464.3 (+22%)	485.7 (-8%)	496.7 (-17%)	615.6 (-26%)	1127.2 (-12%)
Oct (Oct%)	446.5 (+204%)	470.5 (+80%)	484.4 (+47%)	516.2 (-7%)	527.9 (-13%)	657.3 (-22%)	1319.5 (-6%)
Nov (Nov%)	472.9 (+299%)	506.8 (+132%)	531.3 (+73%)	588.8 (-5%)	618 (-10%)	782.4 (-23%)	1375.9 (-7%)
Dec (Dec%)	451.6 (+209%)	560.9 (+101%)	600.5 (+22%)	687.6 (-24%)	751.3 (-26%)	1432.1 (-12%)	1881.2 (-7%)

3.2.2. Demand Chart for Preferred Scenario



3.3. Detailed Cumulative Impact Analysis

The following “Summary of Results” table summarizes the cumulative impacts to flows, aquatic life, and off-stream demand for the project. The section entitled “River Segment Model Statistics” contains mean flows (Flow Out), and drought flows (30- and 90-Day Low Flow), as well as an estimated Consumptive Use Fraction (See description below) as a result of all withdrawals (Cumulative Withdrawal) and discharges (Cumulative Point Source) in the watershed. Minimum Days of Storage Remaining describes the number of days of remaining storage available during the driest period of the model simulation (applicable to impoundment models only). Total Number of Days with Storage < 50% describes the number of days in the simulation in which reservoir levels fall below 50% of full storage. The section entitled “Facility Model Statistics” shows the withdrawals, return flows (Point Source), and the model estimate for potential conservation-required/unmet-demand due to demands exceeding the allowable withdrawal at the intake, or drought triggers based on the cumulative conditions in the watershed and the flow-by rules in effect. There will be one or more columns in this table representing each scenario considered for this analysis.

3.3.1. Summary of Results:

Description	VWP 89-0868	VWP 24-2717
River Segment Model Statistics:	Roanoke River (Altavista)	Roanoke River (Altavista)
Flow Out (cfs) - (i.e mean flow)	1,816.79	1,817.48
Minimum Days of Storage Remaining	NA	NA
30 Day Low Flow (cfs) (i.e drought flow)	439	439.23
90 Day Low Flow (cfs) (i.e drought flow)	456.06	456.36
Consumptive Use Fraction	0.02	0.02
Cumulative Withdrawal (MGD)	52.76	50.86
Cumulative Point Source (MGD)	23.29	21.84
Withdrawal (MGD)	4.93	4.77
Point Source (MGD)	4.63	4.63
Facility Model Statistics:	ALTAVISTA POWER STATION:Roanoke River (Altavista)	ALTAVISTA POWER STATION:Roanoke River (Altavista)
Base Demand (MGY)	521.73	459.66
Withdrawal (MGY)	512.41	459.66
Conservation/Unmet Demand (MGY)	9.32	0
Requested Demand (MGD)	1.43	1.26
Withdrawal Met (MGD)	1.4	1.26
Point Source (MGD)	0.28	0.25
Groundwater Demand (MGD)	0	0
Maximum 30 day conservation/unmet demand (MGD)	0.83	0

3.3.2. Cumulative Consumptive Use Plots:

3.3.2.1. Cumulative use for Current Permit VWP 89-0868

Modeled monthly consumptive use statistics in the Roanoke River (Altavista) in cubic feet per second (cfs). Columns show the modeled non-exceedance flow percentiles and the net % flow change due to cumulative demands for Current Permit VWP 89-0868 . Simulated demands include demands at Altavista Power, including all up-stream demands and all upstream point-source flows. Fields that are marked as 'n/a' indicate that the baseline flow for that time period/percentile was below the model accuracy threshold of 0.1 cfs. Note: Pre and Post data are of different lengths, therefore, comparisons have been made only on overlapping days which may skew the percentile flow values as compared to those that would be calculated from the full time period.

Month	Min	5%	10%	25%	30%	50%	Mean
Jan (Jan%)	461.7 (+54%)	650.3 (+21%)	755.5 (+7%)	945.2 (-23%)	1100.7 (-21%)	1841.3 (-8%)	2272.5 (-8%)
Feb (Feb%)	536.6 (+6%)	698.3 (-14%)	821 (-14%)	1137.3 (-21%)	1311.3 (-18%)	2032.6 (-6%)	2475 (-7%)
Mar (Mar%)	546.9 (+15%)	753.6 (-18%)	913.3 (-16%)	1481.3 (-7%)	1654.6 (-6%)	2297.7 (-5%)	2869.9 (-4%)
Apr (Apr%)	583.7 (-22%)	943.7 (+4%)	1123.6 (+11%)	1265 (-9%)	1403.1 (-12%)	2049.8 (-6%)	2739.9 (-3%)
May (May%)	639.2 (+12%)	979.1 (+21%)	1092.2 (+15%)	1209 (-4%)	1247.9 (-8%)	1650.1 (-9%)	2049.9 (-4%)
Jun (Jun%)	481.5 (+27%)	600.2 (+0%)	635.3 (-14%)	739.8 (-26%)	820.7 (-22%)	1139.5 (-12%)	1669.3 (-9%)
Jul (Jul%)	440.3 (+51%)	479.9 (+16%)	514.1 (-8%)	549.1 (-24%)	571.9 (-24%)	756.2 (-22%)	1159.9 (-13%)
Aug (Aug%)	433.3 (+101%)	459.7 (+36%)	475.9 (+22%)	508.3 (-10%)	522.4 (-17%)	630.7 (-27%)	943.4 (-11%)
Sep (Sep%)	428.9 (+128%)	455.4 (+42%)	463.1 (+22%)	487.1 (-8%)	498 (-16%)	618.8 (-26%)	1118.4 (-13%)
Oct (Oct%)	444.7 (+203%)	467.6 (+79%)	480.6 (+46%)	515.2 (-7%)	526.7 (-13%)	660 (-22%)	1318.1 (-7%)
Nov (Nov%)	471.3 (+298%)	505.3 (+131%)	527.6 (+72%)	588.2 (-5%)	613.9 (-10%)	778.2 (-23%)	1364.7 (-7%)
Dec (Dec%)	459.8 (+215%)	559.2 (+101%)	601.2 (+22%)	689.7 (-24%)	750.1 (-26%)	1415.5 (-13%)	1866.7 (-8%)

3.3.2.2. Cumulative use for Proposed Permit VWP 24-2717

Modeled monthly consumptive use statistics in the Roanoke River (Altavista) in cubic feet per second (cfs). Columns show the modeled non-exceedance flow percentiles and the net % flow change due to cumulative demands for Proposed Permit VWP 24-2717. Simulated demands include demands at Altavista Power, including all up-stream demands and all upstream point-source flows. Fields that are marked as 'n/a' indicate that the baseline flow for that time period/percentile was below the model accuracy threshold of 0.1 cfs. Note: Pre and Post data are of different lengths, therefore, comparisons have been made only on overlapping days which may skew the percentile flow values as compared to those that would be calculated from the full time period.

Month	Min	5%	10%	25%	30%	50%	Mean
Jan (Jan%)	460.6 (+54%)	662.3 (+23%)	757.9 (+7%)	944.5 (-23%)	1096 (-21%)	1832.7 (-9%)	2296.3 (-7%)
Feb (Feb%)	535.3 (+6%)	698.6 (-14%)	816.8 (-15%)	1140.3 (-21%)	1322.4 (-17%)	2022.7 (-6%)	2481.2 (-7%)
Mar (Mar%)	538.4 (+13%)	754.6 (-18%)	895.9 (-17%)	1469.3 (-8%)	1661.8 (-6%)	2308.6 (-5%)	2860.7 (-4%)
Apr (Apr%)	585.4 (-22%)	959 (+6%)	1119.9 (+11%)	1258.8 (-10%)	1375.4 (-14%)	2019.8 (-8%)	2735.4 (-3%)
May (May%)	629.1 (+11%)	971.8 (+21%)	1094.4 (+15%)	1209.3 (-4%)	1236.3 (-9%)	1623.2 (-10%)	2032.2 (-5%)
Jun (Jun%)	484.9 (+28%)	606.8 (+1%)	631.4 (-15%)	727.3 (-28%)	794.4 (-25%)	1110.3 (-15%)	1654.6 (-10%)
Jul (Jul%)	440.7 (+51%)	477.4 (+16%)	517.2 (-7%)	546.2 (-24%)	561.3 (-26%)	746.9 (-23%)	1153.5 (-14%)
Aug (Aug%)	434.9 (+102%)	460.7 (+37%)	477.2 (+23%)	507.6 (-10%)	516.5 (-18%)	628.2 (-27%)	938.6 (-11%)
Sep (Sep%)	429.2 (+128%)	455.6 (+42%)	464.3 (+22%)	485.7 (-8%)	496.7 (-17%)	615.6 (-26%)	1127.2 (-12%)
Oct (Oct%)	446.5 (+204%)	470.5 (+80%)	484.4 (+47%)	516.2 (-7%)	527.9 (-13%)	657.3 (-22%)	1319.5 (-6%)
Nov (Nov%)	472.9 (+299%)	506.8 (+132%)	531.3 (+73%)	588.8 (-5%)	618 (-10%)	782.4 (-23%)	1375.9 (-7%)
Dec (Dec%)	451.6 (+209%)	560.9 (+101%)	600.5 (+22%)	687.6 (-24%)	751.3 (-26%)	1432.1 (-12%)	1881.2 (-7%)

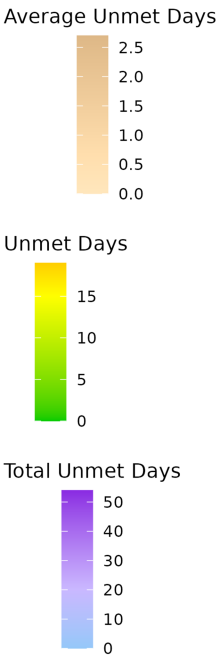
3.3.3. Analysis of Potential Conservation/Unmet Demand at the River Intake:

The following grids are data plotting tools that help visualize data as magnitudes of color intensity. These depict the number of days with required conservation demand reductions or unmet demands for each month of the simulation (due to drought triggers or demands exceeding allowable withdrawal at the intake based on the cumulative conditions in the watershed and the flow-by rules in effect). The cells show the amount of reductions/unmet demand for each month [Number of Unmet Days & Amount (MGD)]. Hydrographs are shown for the period of the simulation with greatest reduction/unmet demand.

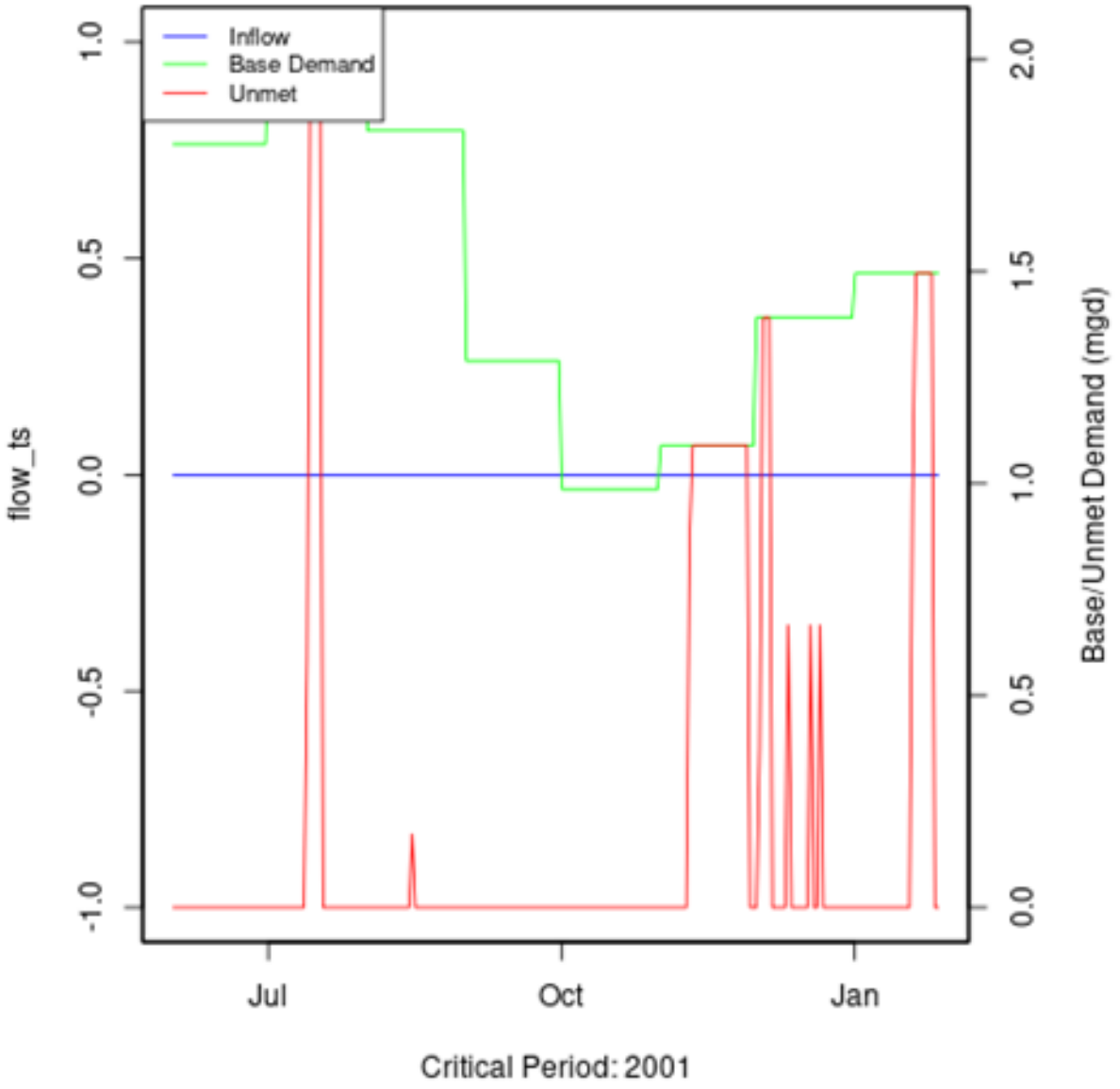
3.3.3.1. Drought reduction/Unmet Demand: VWP 89-0868

Unmet Demand Heatmap

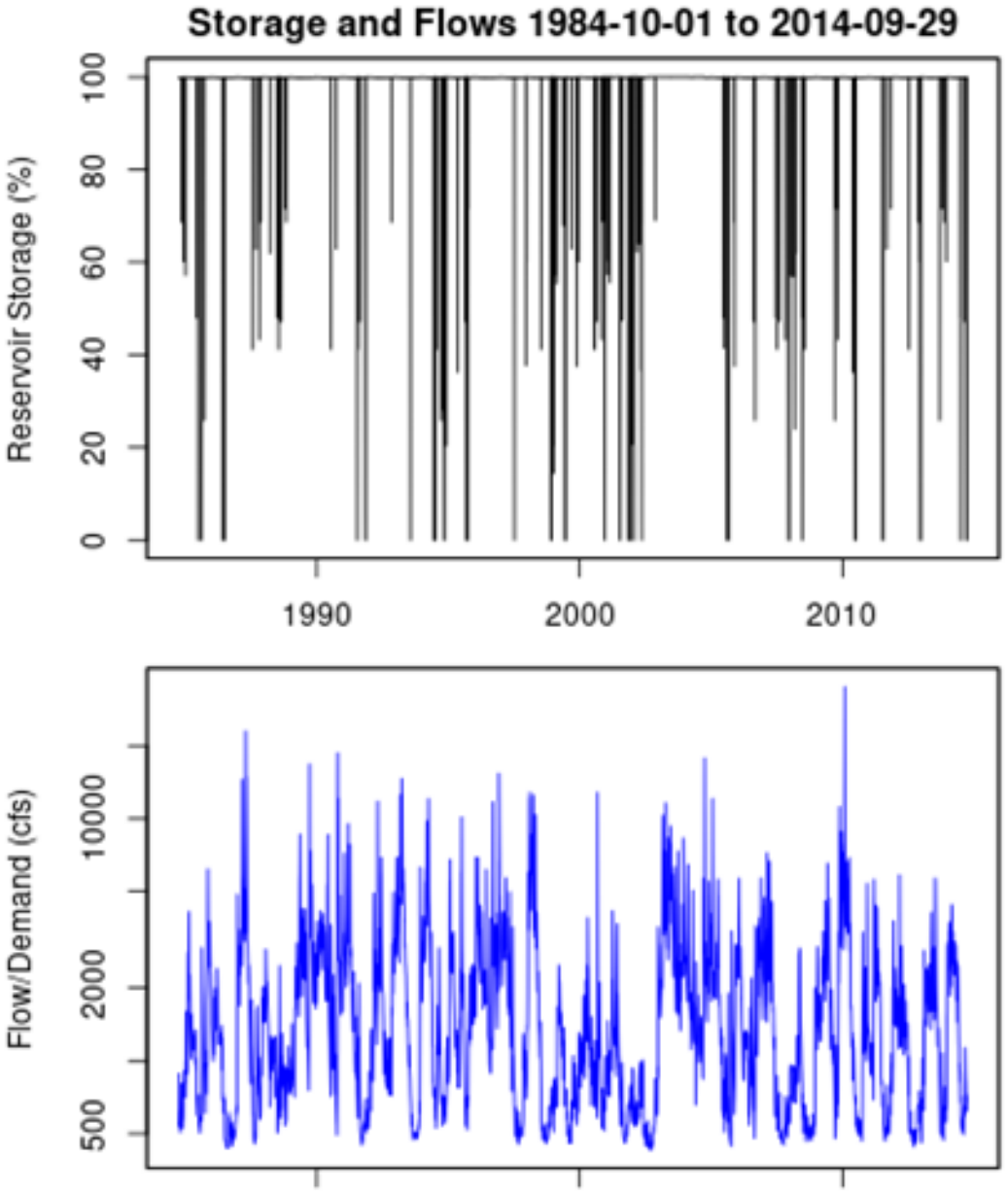
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Totals	Avg
1985	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	4 / 1	4 / 2	2 / 1	1 / 0.4	0 / 0	0 / 0	0 / 0	11	0.9
1986	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	9 / 1	4 / 2	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	13	1.1
1987	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 0.6	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1	0.1
1988	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	2 / 0.5	2 / 0.2	0 / 0	0 / 0	0 / 0	0 / 0	4	0.3
1989	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0	0
1990	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 0.6	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1	0.1
1991	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	4 / 1	1 / 0.2	0 / 0	0 / 0	7 / 1	0 / 0	12	1
1992	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0	0
1993	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	4 / 2	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	4	0.3
1994	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	10 / 2	4 / 1	0 / 0	1 / 0.4	1 / 0.002	11 / 1	1 / 0.7	28	2.3
1995	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 0.2	4 / 0.8	2 / 0.5	0 / 0	0 / 0	7	0.6
1996	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0	0
1997	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	2 / 1	0 / 0	0 / 0	0 / 0	0 / 0	1 / 0.07	3	0.2
1998	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 0.6	0 / 0	0 / 0	0 / 0	4 / 1	8 / 1	13	1.1
1999	1 / 1	0 / 0	0 / 0	0 / 0	0 / 0	14 / 2	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	15	1.2
2000	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	2 / 0.6	1 / 0.2	0 / 0	0 / 0	0 / 0	3 / 1	6	0.5
2001	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	5 / 2	1 / 0.2	0 / 0	0 / 0	19 / 1	7 / 0.9	32	2.7
2002	7 / 1	0 / 0	0 / 0	0 / 0	2 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	9	0.8
2003	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0	0
2004	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0	0
2005	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	2 / 0.1	2 / 0.5	6 / 1	2 / 0.8	0 / 0	0 / 0	0 / 0	12	1
2006	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 0.2	1 / 0.4	0 / 0	0 / 0	0 / 0	2	0.2
2007	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	2 / 0.1	1 / 0.6	1 / 0.2	0 / 0	0 / 0	0 / 0	13 / 1	17	1.4
2008	0 / 0	0 / 0	1 / 0.5	0 / 0	0 / 0	4 / 0.5	0 / 0	1 / 0.4	0 / 0	0 / 0	0 / 0	0 / 0	6	0.5
2009	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 0.4	0 / 0	0 / 0	0 / 0	1	0.1
2010	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	6 / 1	4 / 2	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	10	0.8
2011	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	7 / 1	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	7	0.6
2012	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 0.6	0 / 0	0 / 0	0 / 0	0 / 0	12 / 1	13	1.1
2013	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	1 / 0.4	0 / 0	0 / 0	0 / 0	1	0.1
2014	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	3 / 0.7	4 / 2	1 / 0.2	7 / 1				15	1.2
Totals	8	0	1	0	2	54	53	18	18	3	41	45	243	
Avg	0.3	0	0	0	0.1	1.8	1.8	0.6	0.6	0.1	1.4	1.5		



3.3.3.2. Hydrograph: VWP 89-0868



3.3.3.3. Reservoir Storage: VWP 89-0868



3.3.3.4. Drought reduction/Unmet Demand: VWP 24-2717

Unmet Demand Heatmap

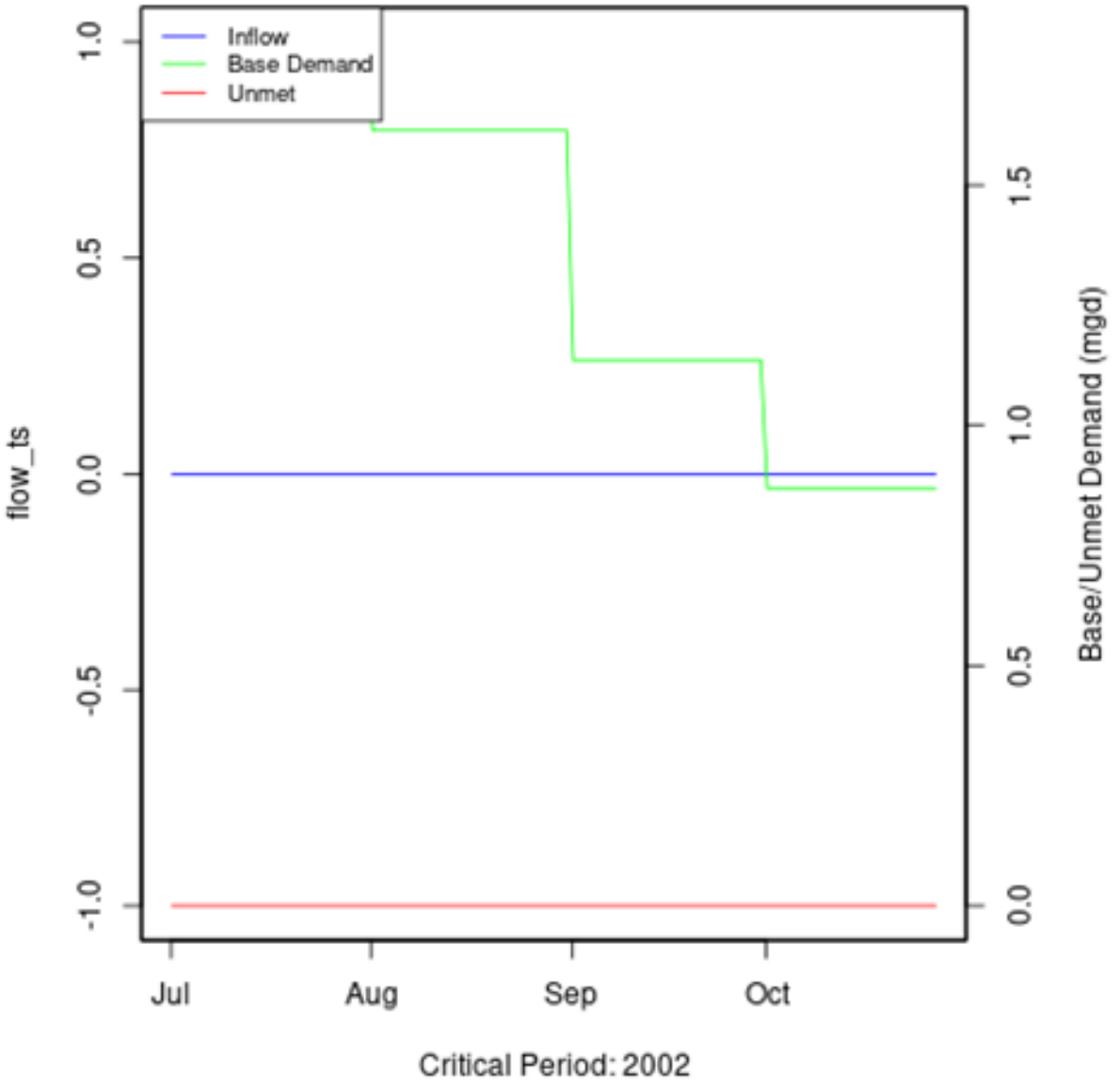
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Totals	Avg
1985	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0	0
1986	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0	0
1987	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0	0
1988	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0	0
1989	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0	0
1990	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0	0
1991	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0	0
1992	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0	0
1993	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0	0
1994	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0	0
1995	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0	0
1996	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0	0
1997	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0	0
1998	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0	0
1999	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0	0
2000	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0	0
2001	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0	0
2002	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0	0
2003	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0	0
2004	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0	0
2005	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0	0
2006	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0	0
2007	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0	0
2008	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0	0
2009	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0	0
2010	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0	0
2011	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0	0
2012	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0	0
2013	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0	0
2014	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0	0 / 0				0	0
Totals	0	0	0	0	0	0	0	0	0	0	0	0	0	
Avg	0	0	0	0	0	0	0	0	0	0	0	0		

Unmet Days

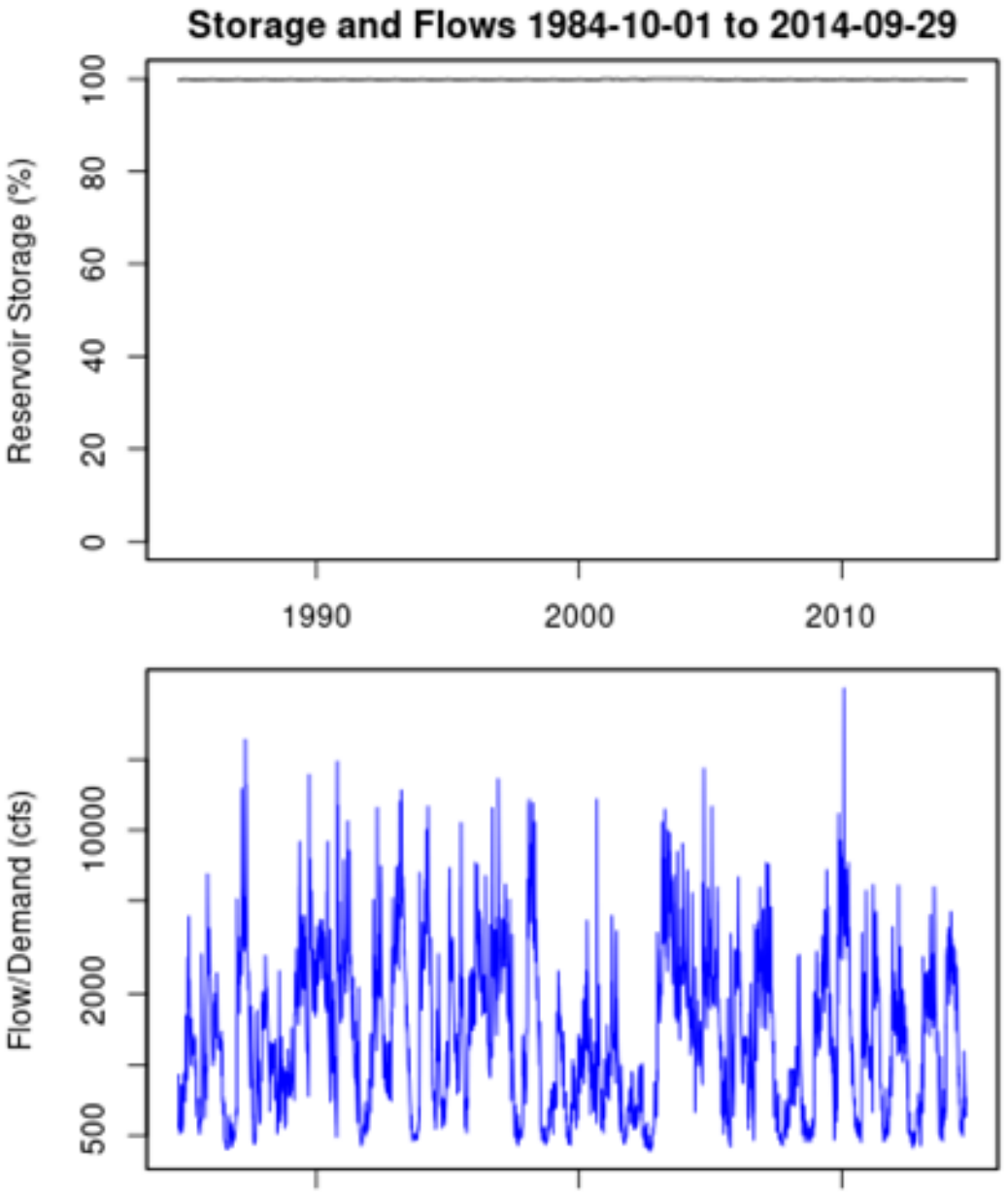
Average Unmet Days

Total Unmet Days

3.3.3.5. Hydrograph: VWP 24-2717

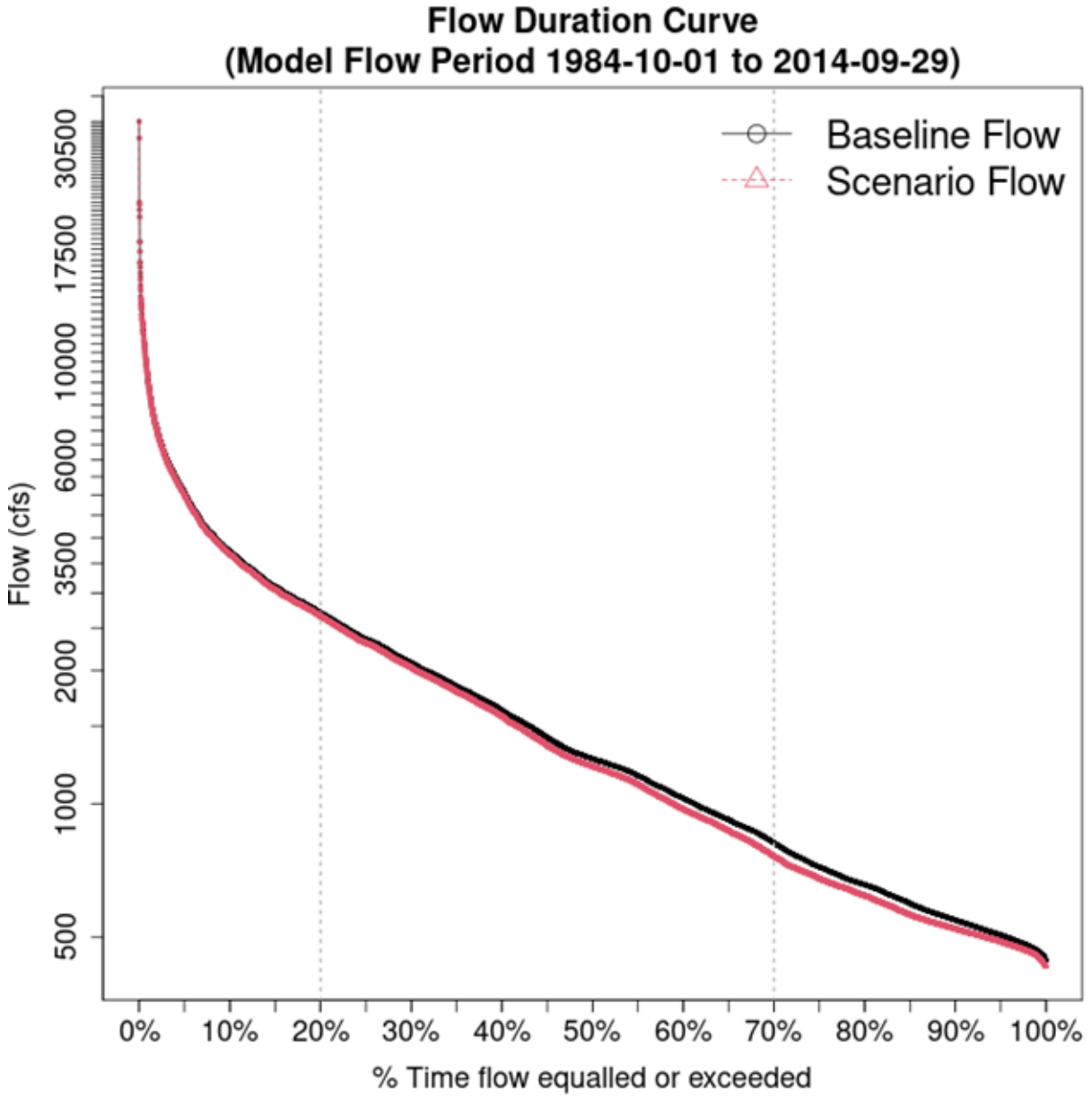


3.3.3.6. Reservoir Storage: VWP 24-2717

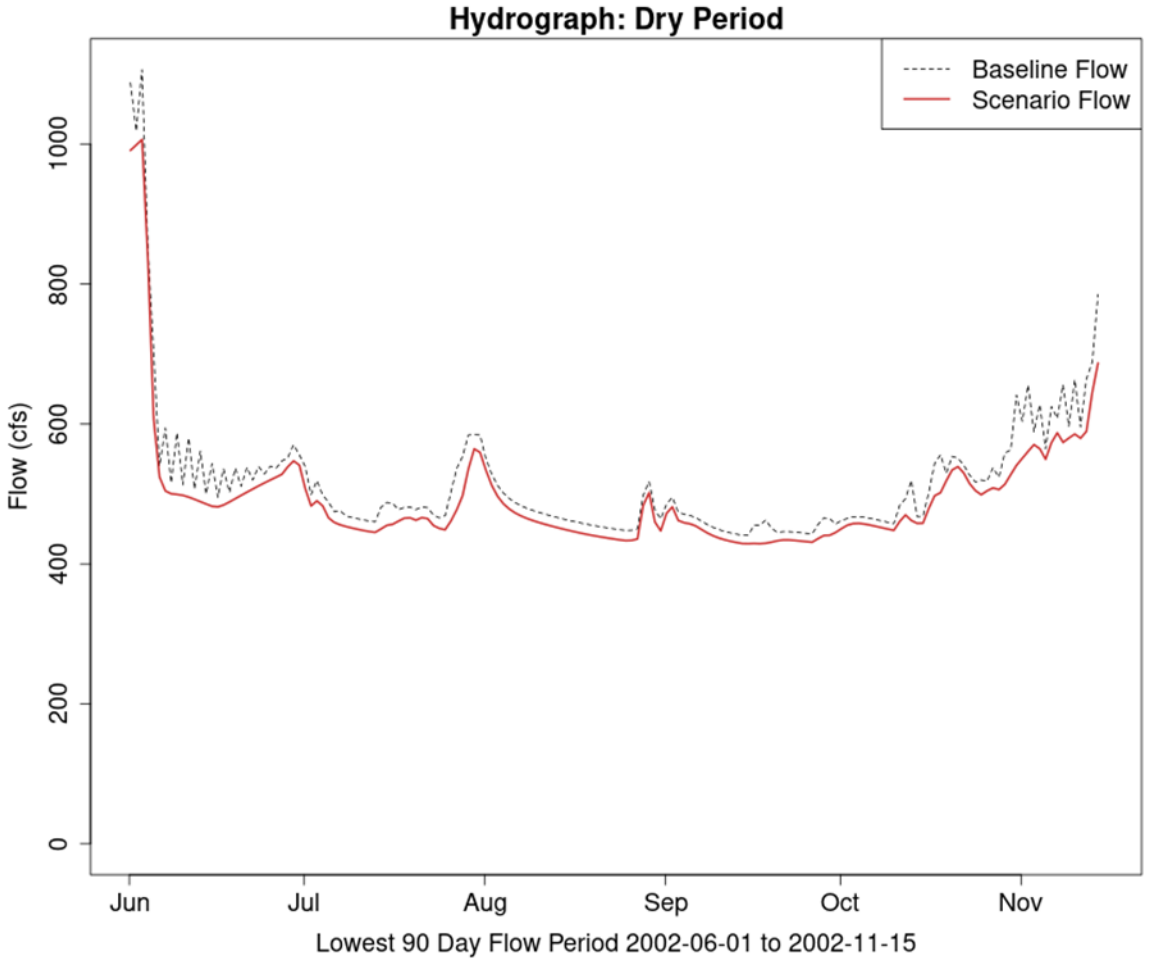


3.3.4. Additional Model Flow Plots:

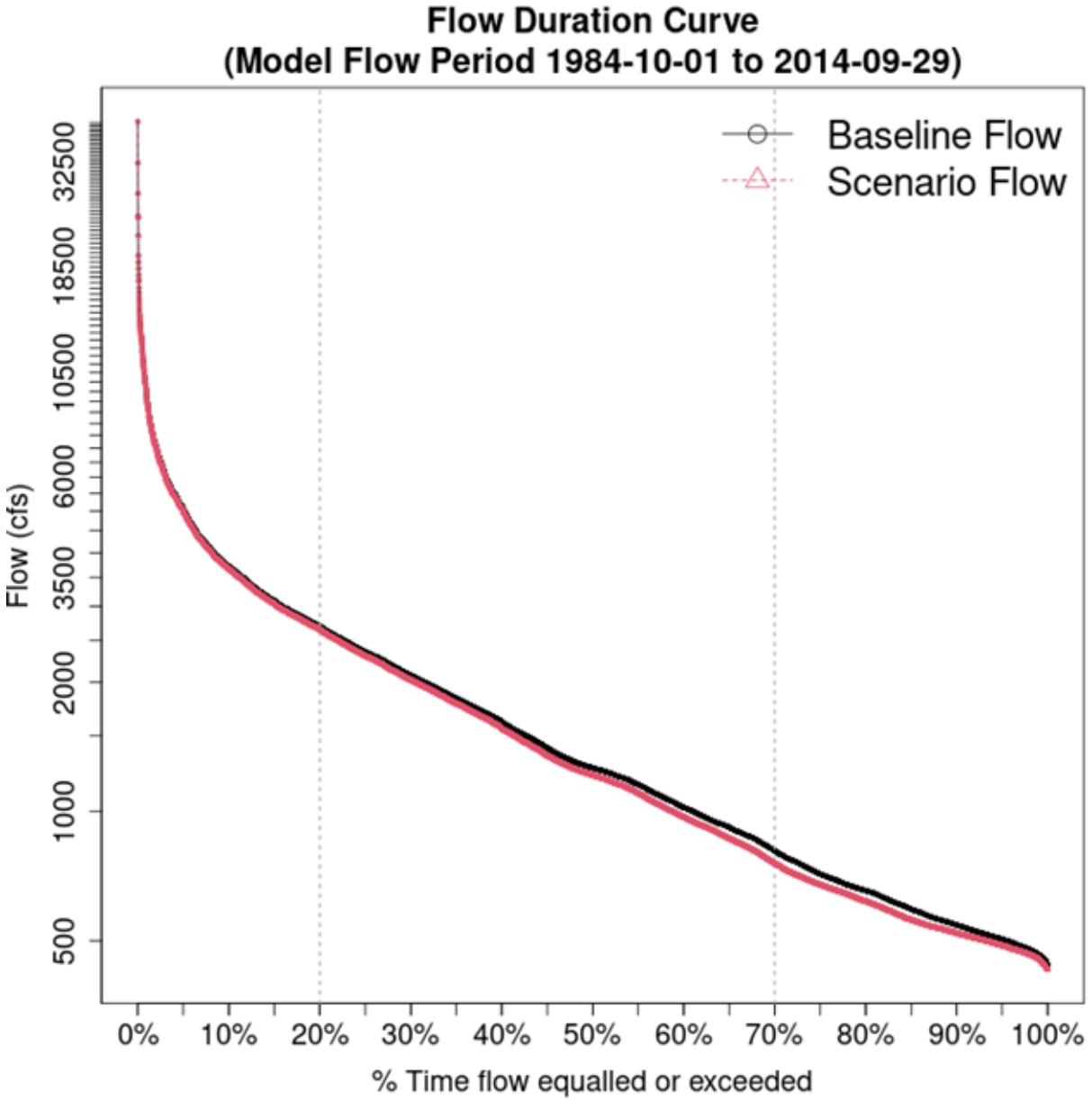
3.3.4.1. VWP 89-0868 :



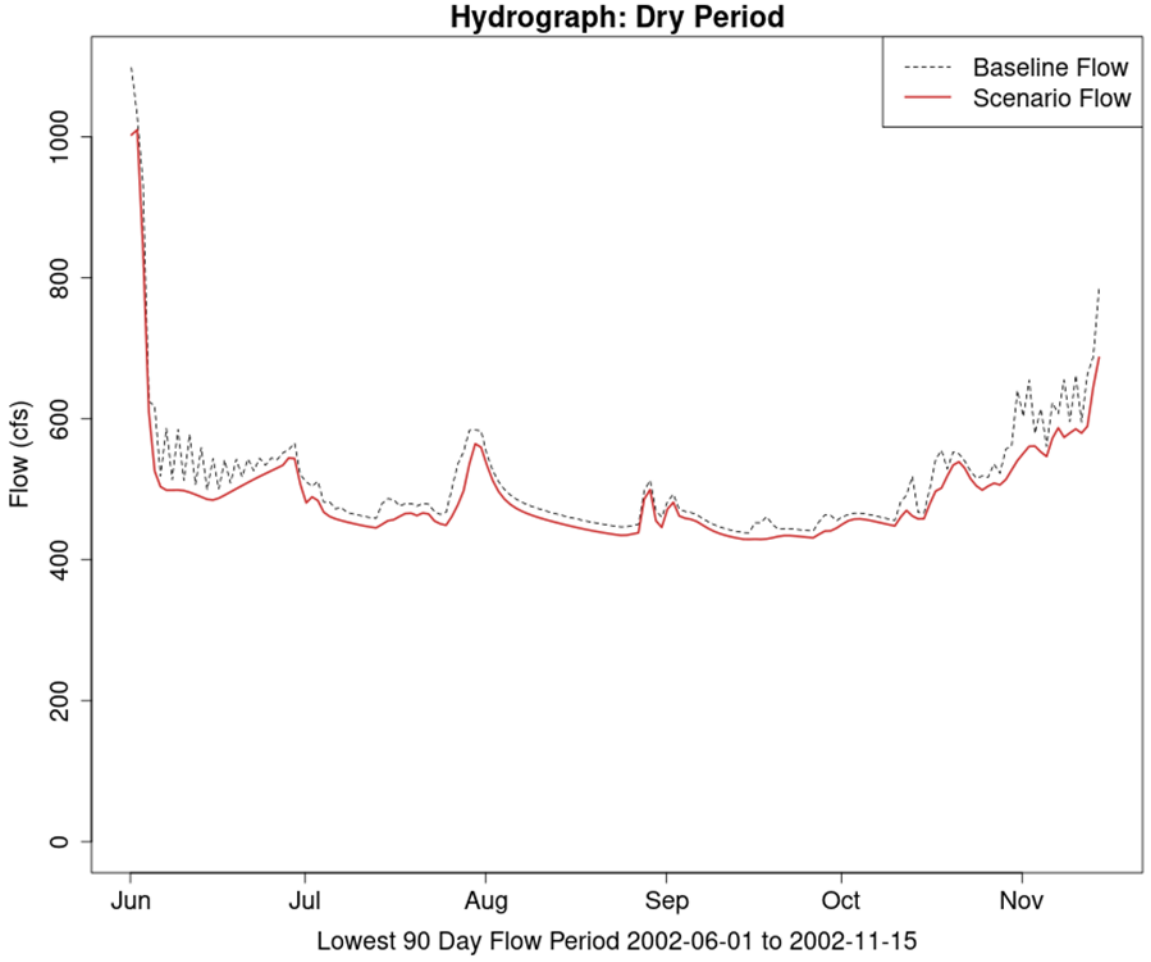
3.3.4.2. VWP 89-0868 :



3.3.4.3. VWP 24-2717 :



3.3.4.4. VWP 24-2717 :



4. VAHydro Model:

4.1. Appendix B - VAHydro

The comprehensive VAHydro hydrologic model is used by the DEQ Office of Water Supply to evaluate instream and off-stream beneficial uses for non-tidal surface water withdrawals throughout Virginia. This model also simulates streamflow with inputs such as precipitation, climate, land use, and topography, as well as local data collected through DEQ water supply planning and reporting programs, which includes all known withdrawals and discharges, as well as operational rules of Virginia Water Protection (VWP) permits and major hydrologic features such as reservoirs.

The VAHydro model is built on the rainfall-evaporation-runoff (RER) time-series from the Chesapeake Bay Model Phase 6[2]. The VAHydro model simulates conditions from 1984-2014 in the Chesapeake Bay watershed drainage, and 1984-2005 in the rivers flowing outside of the Chesapeake Bay watershed. The VAHydro model features high-resolution hydrologic subsections called "river segments" (over 600 river segments in total), roughly the size of HUC 10 hydrologic units, with additional high-resolution segments added for VWP modeling projects as needed.

4.2. Cumulative Impact Analysis (CIA)

DEQ assesses water supply sustainability through Cumulative Impact Analysis (CIA). CIA is a modeling and analysis approach that takes into account the varied hydrologic processes occurring throughout a river network (including meteorological and human water use). By simulating a daily water balance for every individual river segment within a watershed, DEQ is able to evaluate the potential "cumulative impact" of all streamflow changes occurring upstream and downstream of any location within the river system, as well as the downstream impact of a specific proposed or permitted surface water withdrawal.

The goal of the following analysis is to estimate the potential impacts of the proposed water withdrawal upon existing beneficial uses, including both in-stream and off-stream uses. In addition, cumulative impacts from all existing withdrawals are included in the evaluation.

4.2.1. Glossary of Cumulative Impact Modeling Terms

- 30 Day Low Flow (l30): Describes the lowest consecutive 30-day average daily streamflow over the simulation period. This metric is a representation of a short-term, or acute drought.
- 90 Day Low Flow (l90): Represents the lowest consecutive 90-day average daily streamflow over the simulation period. This would represent a prolonged drought.
- Base Demand / Requested Demand: The demand simulated for a facility/intake prior to any reductions due to conservation, depleted storage, or adherence to Minimum Instream Flow operational rules (MIF). In this document, *Base Demand* is expressed as *MGY*, and Requested Demand is given in *MGD*.
- CFS: Cubic Feet Per Second, a common unit of measuring stream flow.
- Consumptive Use Fraction (CU): This is calculated as a fraction of modeled Flow, so it is CU = 1.0 - (Flow / Flow_Baseline), where Flow_Baseline = (Flow + WD - PS), and WD and PS are the total cumulative withdrawals and point source discharges above the point in the stream. In other words, for calculating baseline flow, we take modeled outflow from the river, add the withdrawals back in, and subtract the point source in order to estimate a baseline flow balance. This almost always ends up being a higher number than the modeled Flow out, so it tells us the fraction of baseline flow that is consumed. Occasionally there are water transfers and point sources from groundwater or point

[2] Chesapeake Bay Program Phase 6 Model.

sources that cross watershed boundaries that can make the CU fraction in some watersheds negative, i.e. Flow > Flow_Baseline.

- Cumulative Withdrawal: The amount of water withdrawn by all intakes in a given river segment sub-watershed, and all upstream sub-watersheds. See also: *Cumulative Withdrawal*.
- Days of Storage Remaining: For reservoir models, the quotient of the volume of water in a reservoir divided by the daily rate of withdrawal, calculated at each time step of the entire simulation period.
- Maximum 30-day potential drought reduction/Unmet Demand (MGD): The largest difference between *Requested Demand* and *Withdrawal Met* that results during a continuous 30-day simulation period.
- MGD: Millions of Gallons per Day, a common unit of measuring withdrawal and discharge.
- MGY: Millions of Gallons per Year, a common unit for expressing annual facility demand.
- Minimum Days of Storage Remaining: The minimum simulated *Days of Storage Remaining* in a reservoir.
- Point Source: Water returned to the stream as treated wastewater.
- Withdrawal: The amount of water withdrawn by a single facility, or the total amount of water withdrawn within a single simulated river segment sub-watershed. See also: *Cumulative Withdrawal*.
- Withdrawal Met: The amount of requested demand that was met, on average, throughout the entire simulation period.
- Drought Reduction/Unmet Demand: The difference between *Base Demand* and *Withdrawal Met*, on average, throughout the entire simulation period.

5. Appendix A - Ecological Impacts Assessment:

5.1. Elfgen:

In response to a need for better environmental flow metrics, DEQ has developed a new framework for characterizing relations between streamflow and aquatic organism species richness. Part of an evolving approach to managing environmental flows for maintaining aquatic life; this methodology builds on existing minimum instream ow approaches, allowable withdrawals as a percentage of flow, and extensive flow-habitat studies. For the first time this new framework may allow quantification of potential species loss resulting from flow change and may offer an improved understanding of aquatic life risk variability due to geographic location, stream size and local scale.

This new flow-ecology framework referred to as "elfgen" (*pronounced elf-jen*) derives its name from Ecological Limit Function (ELF) generation (*ELF-gen*). In order to calculate river segment-level richness change, elfgen is first used to produce ELFs, or relations between stream flow and species richness at the HUC 8 scale (See plot below). This is achieved using long term datasets for both ecological and hydrologic data. Ecological data (Fish species richness) is sourced from the VAHydro-EDAS dataset. Hydrologic data (Average Annual Flow) is sourced from the National Hydrography Dataset Plus. The Richness Change values presented in the table below are derived from this flow-ecology relation.

Estimates for richness change are presented both as an absolute number of species (Richness Change (abs)) and as a percentage of the total number of species present (Richness Change (%)). Richness change calculations are derived from the estimated percent total consumptive use[3]. Note: elfgen methodology only applicable for watersheds < 800 cfs mean annual flow.

Description	**VWP 89-0868**	**VWP 24-2717**
Consumptive Use (%)	2	2
Cumulative Withdrawal (MGD)	52.76	50.86
Richness Change (abs)	-0.11	-0.1
Richness Change (%)	-0.27	-0.27

[3] Kleiner et al: https://onlinelibrary.wiley.com/doi/full/10.1111/1752-1688.12876 & Rapp et al: https://onlinelibrary.wiley.com/doi/full/10.1111/1752-1688.12877

6. Appendix C - Nearby Users Table:

	Location	riverseg	Intake_Model_Name	Sub_Watershed	MP_Type	MP_Name	MP_Status	MP 5-yr Avg Use (MGY)	base_demand_mgy
1	-	OR4_8120_7890	ALTAVISTA SERVICE AREA:Roanoke River (Altavista)-ALTAVISTA SERVICE AREA	Roanoke River (Altavista)	intake	MCMINNIS SPRING	active	91.10	95.96
2	-	OR4_8120_7890	ALTAVISTA COUNTRY CLUB:Roanoke River (Altavista)-ALTAVISTA COUNTRY CLUB	Roanoke River (Altavista)	intake	SYCAMORE CREEK	active	0.00	0.00
3	-	OR4_8120_7890	HURT PLANT WTP:Roanoke River (Altavista)-HURT PLANT WTP	Roanoke River (Altavista)	intake	SYCAMORE CREEK	active	0.00	0.27

	Location	riverseg	Intake_Model_Name	Sub_Watershed	MP_Type	MP_Name	MP_Status	MP 5-yr Avg Use (MGY)	base_demand_mgy
4	-	OR4_8120_7890	HURT PLANT WTP:Roanoke River (Altavista)-HURT PLANT WTP	Roanoke River (Altavista)	intake	ROANOKE RIVER	active	1.65	0.27
5	-	OR4_8120_7890	ALTAVISTA POWER STATION:Roanoke River (Altavista)-Dominion - Altavista Power Station	Roanoke River (Altavista)	intake	ROANOKE RIVER	active	171.88	459.66
6	-	OR4_8120_7890	ALTAVISTA WTP:Roanoke River (Altavista)-Altavista Town - Wastewater Treatment Plant	Roanoke River (Altavista)	intake	REED CREEK	active	0.35	668.56
7	-	OR4_8120_7890	ALTAVISTA WTP:Roanoke River	Roanoke River (Altavista)	intake	ROANOKE RIVER	active	558.07	668.56

	Location	riverseg	Intake_Model_Name	Sub_Watershed	MP_Type	MP_Name	MP_Status	MP 5-yr Avg Use (MGY)	base_demand_mgy
			(Altavista)-Altavista Town - Wastewater Treatment Plant						

7. Appendix D - Facility Location, Withdrawals, and Discharges

propname	riverseg	wd_mgd_runid_400	ps_mgd_runid_400	wd_mgd_runid_600	ps_mgd_runid_600
ALTAVISTA WTP:Roanoke River (Altavista)	OR4_8120_7890	1.8316795681	1.6262890075	1.8316795681	1.6262890075
THE LANE COMPANY, INC.:Roanoke River (Altavista)	OR4_8120_7890	0.0000000000	0.0000000000	0.0000000000	0.0000000000
ALTAVISTA SERVICE AREA:Roanoke River (Altavista)	OR4_8120_7890	0.2628958747	0.2574581918	0.2628958747	0.2574581918
HURT PLANT WTP:Roanoke River (Altavista)	OR4_8120_7890	0.0007321883	0.0007389891	0.0007321883	0.0007389891
Pittsylvania Power Station (formerly HURT FACILITY) :Roanoke River (Altavista)	OR4_8120_7890	1.4171480855	1.3958908187	1.4136048433	1.3924007256
ALTAVISTA COUNTRY	OR4_8120_7890	0.0000000000	0.0000000000	0.0000000000	0.0000000000

propname	riverseg	wd_mgd_runid_400	ps_mgd_runid_400	wd_mgd_runid_600	ps_mgd_runid_600
CLUB:Roanoke River (Altavista)					
ALTAVISTA POWER STATION: Roanoke River (Altavista)	OR4_8120_7890	1.4038588463	0.2807717823	1.2593434765	0.2518686893

8. Appendix D - River Model Withdrawals, Discharges and Flows

propname	riverseg	l90_Qout	wd_mgd_runid_400	ps_mgd_runid_400	wd_mgd_runid_600	ps_mgd_runid_600
Roanoke River (Altavista)	OR4_8120_7890	456.3619	4.928035	4.627125	4.773256	4.627125

Attachment B – Water Conservation Conditions

Mandatory Non-essential Water Use Restrictions
Virginia Drought Assessment and Response Plan

The following non-essential water uses will be prohibited during periods of declared drought emergencies. Please note the exceptions that follow each prohibited use. These prohibitions and exceptions will apply to uses from all sources of water and will only be effective when the Governor of Virginia or the Virginia Drought coordinator declares a Drought Emergency. Water use restrictions shall not apply to the agricultural production of food or fiber, the maintenance of livestock including poultry, nor the commercial production of plant materials, *provided that best management practices are applied to assure the minimum amount of water is utilized*.

1. ***Unrestricted irrigation of lawns is prohibited.***

   - Newly sodded and seeded areas may be irrigated to establish cover on bare ground at the minimum rate necessary for no more than a period of 60 days. Irrigation rates may not exceed one inch of applied water in any 7-day period.
   - Gardens, bedding plants, trees, shrubs and other landscape materials may be watered with handheld containers, handheld hoses equipped with an automatic shutoff device, sprinklers or other automated watering devices at the minimum rate necessary but in no case more frequently than twice per week. Irrigation should not occur during the heat of the day.
   - All allowed lawn irrigation must be applied in a manner to assure that no runoff, puddling or excessive watering occurs.
   - Irrigation systems may be tested after installation, routine maintenance or repair for no more than ten minutes per zone.

2. ***Unrestricted irrigation of golf courses is prohibited.***

   - Tees and greens may be irrigated between the hours of 9:00 p.m. and 10:00 a.m. at the minimum rate necessary.
   - Localized dry areas may be irrigated with a handheld container or handheld hose equipped with an automatic shutoff device at the minimum rate necessary.
   - Greens may be cooled by syringing or by the application of water with a handheld hose equipped with an automatic shutoff device at the minimum rate necessary.
   - Fairways may be irrigated between the hours of 9:00 p.m. and 10:00 a.m. at the minimum rate necessary not to exceed one inch of applied water in any ten-day period.
   - Fairways, tees and greens may be irrigated during necessary overseeding or resodding operations in September and October at the minimum rate necessary. Irrigation rates during this restoration period may not exceed one inch of applied water in any seven-day period.

- Newly constructed fairways, tees and greens and areas that are re-established by sprigging or sodding may be irrigated at the minimum rate necessary not to exceed one inch of applied water in any seven-day period for a total period that does not exceed 60 days.
- Fairways, tees and greens may be irrigated without regard to the restrictions listed above so long as:
    - The only water sources utilized are water features whose primary purpose is stormwater management;
    - Any water features utilized do not impound permanent streams;
    - During declared Drought Emergencies these water features receive no recharge from other water sources such as ground water wells, surface water intakes, or sources of public water supply; and,
    - All irrigation occurs between 9:00 p.m. and 10:00 a.m.
- All allowed golf course irrigation must be applied in a manner to assure that no runoff, puddling or excessive watering occurs.
- Rough areas may not be irrigated.

3. ***Unrestricted irrigation of athletic fields is prohibited.***

- Athletic fields may be irrigated between the hours of 9:00 p.m. and 10:00 a.m. at a rate not to exceed one inch per application or more than a total of one inch in multiple applications during any ten-day period. All irrigation water must fall on playing surfaces with no outlying areas receiving irrigation water directly from irrigation heads.
- Localized dry areas that show signs of drought stress and wilt (curled leaves, foot-printing, purpling) may be syringed by the application of water for a cumulative time not to exceed fifteen minutes during any twenty-four-hour period. Syringing may be accomplished with an automated irrigation system or with a handheld hose equipped with an automatic shutoff device at the minimum rate necessary.
- Athletic fields may be irrigated between the hours of 9:00 p.m. and 10:00 a.m. during necessary overseeding, sprigging or resodding operations at the minimum rate necessary for a period that does not exceed 60 days. Irrigation rates during this restoration period may not exceed one inch of applied water in any seven-day period. Syringing is permitted during signs of drought stress and wilt (curled leaves, foot-printing, purpling).
- All allowed athletic field irrigation must be applied in a manner to assure that no runoff, puddling or excessive watering occurs.
- Irrigation is prohibited on athletic fields that are not scheduled for use within the next 120-day period.
- Water may be used for the daily maintenance of pitching mounds, home plate areas and base areas with the use of handheld containers or handheld hoses equipped with an automatic shutoff device at the minimum rate necessary.

- Skinned infield areas may utilize water to control dust and improve playing surface conditions utilizing handheld containers or handheld hoses equipped with an automatic shutoff device at the minimum rate necessary no earlier than two hours prior to official game time.

4. ***Washing paved surfaces such as streets, roads, sidewalks, driveways, garages, parking areas, tennis courts, and patios is prohibited.***

   - Driveways and roadways may be pre-washed in preparation for recoating and sealing.
   - Tennis courts composed of clay or similar materials may be wetted by means of a hand-held hose equipped with an automatic shutoff device at the minimum rate necessary for maintenance. Automatic wetting systems may be used between the hours of 9:00 p.m. and 10:00 a.m. at the minimum rate necessary.
   - Public eating and drinking areas may be washed using the minimum amount of water required to assure sanitation and public health.
   - Water may be used at the minimum rate necessary to maintain effective dust control during the construction of highways and roads.

5. ***Use of water for washing or cleaning of mobile equipment including automobiles, trucks, trailers and boats is prohibited.***

   - Mobile equipment may be washed using handheld containers or handheld hoses equipped with automatic shutoff devices provided that no mobile equipment is washed more than once per calendar month and the minimum amount of water is utilized.
   - Construction, emergency or public transportation vehicles may be washed as necessary to preserve the proper functioning and safe operation of the vehicle.
   - Mobile equipment may be washed at car washes that utilize reclaimed water as part of the wash process or reduce water consumption by at least 10% when compared to a similar period when water use restrictions were not in effect.
   - Automobile dealers may wash cars that are in inventory no more than once per week utilizing handheld containers and hoses equipped with automatic shutoff devices, automated equipment that utilizes reclaimed water as part of the wash process, or automated equipment where water consumption is reduced by at least 10% when compared to a similar period when water use restrictions were not in effect.
   - Automobile rental agencies may wash cars no more than once per week utilizing handheld containers and hoses equipped with automatic shutoff devices, automated equipment that utilizes reclaimed water as part of the wash process, or automated equipment where water consumption is reduced by at least 10% when compared to a similar period when water use restrictions were not in effect.
   - Marine engines may be flushed with water for a period that does not exceed 5 minutes after each use.

6. ***Use of water for the operation of ornamental fountains, artificial waterfalls, misting machines, and reflecting pools is prohibited.***

   - Fountains and other means of aeration necessary to support aquatic life are permitted.

7. ***Use of water to fill and top off outdoor swimming pools is prohibited.***

   - Newly built or repaired pools may be filled to protect their structural integrity.
   - Outdoor pools operated by commercial ventures, community associations, recreation associations, and similar institutions open to the public may be refilled as long as:
     - Levels are maintained at mid-skimmer depth or lower;
     - Any visible leaks are immediately repaired;
     - Backwashing occurs only when necessary to assure proper filter operation;
     - Deck areas are washed no more than once per calendar month (except where chemical spills or other health hazards occur);
     - All water features (other than slides) that increase losses due to evaporation are eliminated; and
     - Slides are turned off when the pool is not in operation.
   - Swimming pools operated by health care facilities used in relation to patient care and rehabilitation may be filled or topped off.
   - Indoor pools may be filled or topped off.
   - Residential swimming pools may be filled only to protect structural integrity, public welfare, safety and health and may not be filled to allow the continued operation of such pools.

8. ***Water may be served in restaurants, clubs, or eating-places only at the request of customers.***