

**NEW JERSEY WATER SUPPLY AUTHORITY**

**BASIS AND BACKGROUND STATEMENT**

**PROPOSED AMENDMENTS TO N.J.A.C. 7:11-2.1 et seq. IN THE SCHEDULE OF  
RATES, CHARGES AND DEBT SERVICE ASSESSMENTS  
FOR THE SALE OF WATER FROM THE RARITAN BASIN SYSTEM AND N.J.A.C.  
7:11-27(c) RULES FOR THE USE OF WATER SUPPLY PROPERTY**

**ADJUSTMENT OF GENERAL RATE SCHEDULE FOR  
OPERATIONS AND MAINTENANCE COMPONENT  
FOR FISCAL YEAR 2024**

**ADJUSTMENT OF DEBT SERVICE ASSESSMENT FOR  
FOR FISCAL YEAR 2024**

**ADJUSTMENT OF GENERAL RATE SCHEDULE FOR  
CAPITAL FUND COMPONENT FOR FISCAL YEAR 2024**

**ADJUSTMENT OF SOURCE WATER PROTECTION FUND  
COMPONENT FOR FISCAL YEAR 2024**

**AMENDMENT TO PROHIBITED ACTIVITIES ON WATER SUPPLY PROPERTY**

**Effective Date: July 1, 2023**

**Proposed: 11/7/2022**

**NEW JERSEY WATER SUPPLY AUTHORITY  
PROPOSED RATE ADJUSTMENTS FOR FISCAL YEAR 2024  
RARITAN BASIN SYSTEM**

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**PART I - EXPLANATION OF PROPOSED REVISED RATE STRUCTURE**

**Overview of Rate Proposal for Fiscal Year 2024**  
**(July 1, 2023 - June 30, 2024)**

The New Jersey Water Supply Authority (Authority) is proposing to adjust its Schedule of Rates, Charges and Debt Service Assessments for the Sale of Water from the Raritan Basin System, to cover expenses for the Fiscal Year (FY) starting on July 1, 2023.

**Summary of Proposed Adjustments**

<b>Component</b>	<b>Current (FY2023) Rates Per MG 7/1/2022 - 6/30/2023</b>	<b>Proposed (FY2024) Rates Per MG 7/1/2023 - 6/30/2024</b>
Operations & Maintenance Assessment	\$194.00	\$203.00
Debt Service Assessment Dredging/ RV Structure Refurbishment/Spruce Run	\$85.00	\$109.00
Capital Fund Component	\$33.00	\$33.00
Source Water Protection Fund Component	\$24.00	\$20.00
Total Rate	\$336.00 /mg	\$365.00 /mg

The General Rate Schedule for Operations and Maintenance (O&M) was last adjusted effective July 1, 2022 to cover the operating expenses of the System for FY2023. The FY2024 O&M sales base of will remain at 182.339 million gallons per day (mgd). The O&M Component is projected to increase for FY2024 from \$194.00 per million gallons to \$203.00 per million gallons.

With the allocation of appropriate Headquarters expenses and insurance costs to the Manasquan Reservoir Water Supply System, the projected operating costs for FY2024 require that an O&M Component of \$203.00 per million gallons be charged starting on July 1, 2023.

In recent fiscal years, actual O&M Component adjustments have been minimized because of credits for receipts of unanticipated revenues from the sale of water in excess of contractual amounts, positive budget variances during the preceding fiscal years or from uses of other one-time sources of revenue. These credits have the effect of obscuring the full O&M Component adjustment needed and as a result Raritan Basin System rates do not represent full cost pricing. The amount available for the Rate Stabilization Fund was \$1,286,340 in FY2023, and the amount available in FY2024 will be \$1,862,950. Overdraft sales increased from \$216,337 in FY2023 to \$862,947 in FY2024. An additional \$1,000,000 in prior year positive budget variance and source water protection fund transfers are being used in FY2024 to offset the O&M

component. These credits, along with the recommended increase of \$9.00 per million gallons in the Operations and Maintenance Component, will provide for the full funding of anticipated Operations and Maintenance costs.

The Authority established the Source Water Protection Fund Component in FY2003 to protect the quality and quantity of waters in the Raritan Basin System. The Authority is proposing a decrease of \$4.00 per million gallons for this rate component, which is anticipated to be a temporary reduction to ease the overall rate impact given increases in other rate components in FY2024. This rate component supports debt service on acquired critical watershed parcels and matching dollars for watershed protection projects, and the Authority projects that there will be sufficient funds raised to service outstanding debt and fund other source water protection projects in FY2024.

The Authority has issued final bonds through the New Jersey Infrastructure Bank (NJIB) to finance the dredging of a 10.5-mile segment of the Delaware and Raritan Canal (D&R Canal) between Kingston at Lincoln Highway and Amwell Road in Franklin Township, Somerset County, New Jersey. This project has been completed. The Authority has also submitted an application to the NJIB to finance the refurbishment of structures within the Round Valley Reservoir complex. Additionally, the Authority has begun embankment and spillway improvement projects at the Spruce Run Reservoir and expects to submit applications with the NJIB for financing of these projects. (See Schedule 13 and following explanations for further details on these projects.) The Authority proposes increasing the NJIB rate component from \$85.00 per million gallons to \$109.00 per million gallons to fund the debt service in FY2024 and beyond for these three projects.

Finally, the Authority established a "Capital Fund Component" of the rate commencing July 1, 1994. This Component is used to fund the Authority's current Capital Improvement Program without incurring long-term debt. The Capital Fund Component was increased in FY2008 from \$21.00 to \$33.00 per million gallons, funded from the 1981 Bond Act debt service savings. The rate component was reduced to \$30.00 per million gallons in FY2012 to accommodate pressure on the O&M Component in order to keep the overall rate at \$231.00 per million gallons. The Authority increased this component of the rate from \$30.00 to \$33.00 per million gallons in FY2016 and proposes no change to the rate of \$33.00 per million gallons for FY2024.

Table 1 on page 12 shows the increase in rates for each of the rate components and reflects a total rate of \$365.00 per million gallons for FY2024.

The balance of this document contains a further discussion of the individual rate components, a schedule of events and detailed supporting information for the proposed rate adjustments.

A pre-public hearing on the proposed rate adjustments is scheduled at 10:00 a.m. on Friday, January 6, 2023.

A public hearing on the proposed rate adjustments is scheduled at 10:00 a.m. on Friday, February 3, 2023.

Further information regarding the dial-in information or location for the pre-public hearing meeting and for the public hearing will be posted on the Authority's website at <https://www.njwsa.org/public-notices.html> at least 15 days prior to the date of the meeting/hearing.

The New Jersey Register Comment Period is scheduled to close on March 4, 2023 and the public hearing record on the proposed rate adjustments is scheduled to close on March 13, 2023.

Final action on the rate adjustment is scheduled for the Authority's May 1, 2023 meeting. The FY2024 rate will take effect on July 1, 2023.

### **Distribution of Headquarters General and Administrative Costs and Insurance Costs to all Operating Systems**

On July 1, 1990 the Authority placed the Manasquan Reservoir Water Supply System in operation to provide an untreated water supply for use throughout Monmouth County. In addition to this major System, the Authority also began operation of the Water Treatment Plant and Transmission System for the Monmouth County Improvement Authority (MCIA) on July 1, 1990. The Boroughs of Brielle, Spring Lake, Spring Lake Heights, Sea Girt and Wall Township entered into agreements with the MCIA for this treatment/transmission system, which treats and conveys their portion of the supply from the Manasquan Reservoir System. In December 2008, the five member communities created the Southeast Monmouth Municipal Utilities Authority and in September 2009 purchased the Water Treatment Plant from the MCIA and the Authority continues to operate the Water Treatment Plant. The Authority is operating, maintaining and managing three distinct Systems each with its own budget, cost accountability and revenue stream.

The Authority's Headquarters' staff located in Clinton provides general and administrative support services for all three Systems. These services include, but are not limited to, Financial Management, Payroll, Human Resources, Purchasing, Contract Administration, Risk Management and overall management. In order to equitably assess each of the three Systems, the Authority previously retained the services of an auditing firm to develop a methodology for the allocation of the Headquarters General and Administrative costs to all three operating Systems. After the close of each fiscal year, the Authority's auditors provide the Authority with their findings as to the adjustment, if any, to the allocation factors and the actual audited expenditures for the fiscal year.

The audit report for the immediately preceding fiscal year ending June 30 is available during November. Each September the Authority formulates the proposed budgets for the upcoming fiscal year starting on the following July 1. The adjusted allocation factors, if any, and the audited expenditures for the previous fiscal year are used to establish a debit or credit for

each of the three operating Systems. This debit or credit is applied to the budgets being prepared each September for the upcoming fiscal year starting on July 1.

An independent accounting firm performed the Authority's FY2022 audit. The audit included a review of the allocation factors as well as the actual audited expenditures. The appropriate adjustments have been made to the FY2024 budget based on the FY2022 audit. A copy of the Auditor's report on the allocation of the Headquarters General and Administrative costs is included in the Appendices to the rate proposal package for each System.

Insurance costs are also allocated to each System based upon the recommendations of the Authority's Risk Management Consultant. See the rate proposal package for more information on insurance charges.

### **Analysis of Significant Changes in Operations and Maintenance Expenses** **Raritan Basin System**

#### **Overview of Projected Operational Expenses**

The Authority's proposed FY2024 Raritan Basin System Operating Expense Budget is increasing by \$1,238,529 from FY2023. The Total Budget Requirement, which is net of the allocation of appropriate Headquarters General and Administrative expenses to the Manasquan Water Supply System, and includes capital equipment and contribution to reserves, is \$15,453,009. This is \$1,132,087 more than the FY2023 budget of \$14,320,922. The Capital Equipment budget of \$67,296 is \$37,558 more than the FY2023 budget of \$29,738 and utilizes \$800,000 from the Authority's capital equipment reserve as a funding source. The proposed contributions to the Reserve for Formal Dam Inspections (\$10,000), Capital Equipment Reserve (\$150,000) and the Pumping Reserve (\$150,000) remain at FY2023 levels. There are no contributions scheduled for the Depreciation Reserve and the Self-Insurance Reserve in FY2024. These Reserves last received a \$100,000 and \$150,000 contribution in FY2011, respectively, but are sufficiently funded at the present time. There are no proposed contributions to the Operations and Maintenance Reserve, Major Rehabilitation Reserve or the Pension Reserve. The reserve for capital equipment purchases established in FY2015 requires an additional year of funding with a simultaneous direct expenditure for capital equipment because six years of stable rates from FY2009 through FY2014 caused deferral of equipment purchases. It is still the Authority's intention to fund the reserve at an annual level of \$150,000 to eliminate rate fluctuations associated with the annual change in level of capital equipment purchases once the reserve is adequately funded. In FY2017 for the first time, the Authority funded a reserve for other post-employment benefits (accumulated sick leave payout for retirees) of \$181,000. There are no proposed contributions to this reserve for FY2024. All of these modifications result in a total FY2024 budget requirement of \$15,453,009 which is an increase of 7.9 percent relative to FY2023 (Page 15).

Seventeen of the thirty-one FY2024 direct operating expense accounts are projected to increase, but only eight accounts by \$5,000 or more relative to FY2023. The remainder of the operating expense accounts are projected to be level or decrease relative to FY2023. The most significant projected increases in the budget occur in the Protective Services (Insurance), Special and Professional Services and Vehicular Fuel categories, while the most significant projected

decreases in the budget occur in the Maintenance Supplies and Printing and Office Supplies categories. In Salary and Fringe, regular salary is increasing by \$111,150, reflecting the impact of cost of living and salary step increases. Fringe benefits for active employees are increasing by 13.5 percent, reflecting significant projected healthcare premium increases for both active employees and retirees. The Authority is projecting three additional retirees in FY24 who will be eligible for Authority funded healthcare. Salaries and benefits constitute approximately 74 percent of the Authority's operating budget, and are increasing approximately 5.6 percent relative to FY2023.

### Salaries and Benefits

Authority employees within the Communications Workers of America (CWA), the International Federation of Professional Technical Engineers (IFPTE) and the International Brotherhood of Electrical Workers (IBEW) are currently operating under a contract that expires on June 30, 2023. The FY2024 budget incorporates all union negotiated step increases in the current union contracts and assumes a 2% cost of living increase. The IFPTE/AFL-CIO represents the Authority's Maintenance, Craft and Security Units and the CWA represents the Authority's Administrative and Clerical, Primary Level and Higher Level Supervisors Units. The IBEW represents several management employees. Also included is a 2% cost of living increase for the five members of Authority management who are not represented by a union. The Authority is budgeting 62 percent of the Salary budget for fringe benefits in FY2024, exclusive of retiree medical.

Pension expense payable to the state of New Jersey on April 1, 2023 is expected to be approximately \$1,040,000 for the Raritan System. The Authority has budgeted \$1,048,700 for this line item in FY2024. Although increases in this category have stabilized in the past several years, there is still a level of uncertainty in this expense item because the pension system remains significantly underfunded.

### Overtime Salaries and Wages

The Authority's overtime expenses are projected to increase by approximately \$7,366 in FY2024. Overtime expenses are incurred within Security and O&M Facilities and Canal Operations principally (those areas operating within a crew or shift structure).

### Active and Retiree Health Benefits

Employees who retired with a minimum of 25 years of service prior to July 1, 1997 are entitled to paid health benefits. Those who attain 25 years on or after July 1, 1997 share some portion of post-retirement health benefit costs with the employer as determined by union contract or bargaining unit agreement. The Authority is budgeting three additional retirees in FY2024. Indications from state level negotiations point to significant increases in health care premiums in calendar year 2023 (24 percent for active employee medical, and 12 percent for retiree medical). Centers for Medicare and Medicaid Services (CMS) estimates that national health care spending will increase at an annual rate of 5.1 percent from 2021-2030. Starting with actual 2022 premiums, the Authority has budgeted a 24 percent medical premium increase for active

employees and a 12 percent medical premium increase for retirees for CY2023. For CY2024, a 5.1% increase was assumed for both categories. The budget contains sufficient funds for 62 retired employees.

### **Insurance Program**

The Authority is recommending an approximately 16% increase (\$200,000) in insurance expense for FY2024, reflecting general market conditions and based on the advice of the Authority's insurance broker and consultant. Broker services are remarketed every three years and the insurance program is renewed on March 1.

Allocation of the Primary, Umbrella and Public Officials Liability insurance costs among the three Systems is based upon proportionate water sales. The Automobile Liability cost is allocated based upon the assignment of vehicular equipment to each System. The cost of the Business Property coverage is allocated on the basis of insured values for each System and the Workers Compensation premiums are allocated on the basis of salaries for each System.

### **Interest Income**

The projected interest earnings for FY2024 are \$84,400 based upon a rate of 1.0 percent for short-term investments. This represents an increase of \$62,400 as compared to FY2023. (Schedule 7, page 25), reflecting overall market increases in interest rates.

### **Reserve Contributions**

During FY2024, the Authority will make no contributions from rate component sources to the Depreciation Reserve. Interest earnings from long-term investment accounts have historically been applied to the Depreciation Reserve and are serving to keep this reserve fully funded.

The Authority will contribute \$150,000 to the pumping reserve, and will do so every year, as this will be the primary funding mechanism for pump exercises and reservoir refilling requirements. The Self Insurance Reserve fund will receive no funding in FY2024. The Authority will continue funding for the Reserve for Formal Dam Inspections at \$10,000 in order to avoid future swings in the professional services accounts for expenses associated with this three-year cycle. The Authority will contribute \$150,000 to the Capital Equipment Reserve, and will do so every year, as this will be the primary funding mechanism for capital equipment purchases. When the reserve reaches the appropriate level, while equipment purchases will continue to be identified in the Basis and Background Document and approved by the Board, the direct line item will be removed from the rate and replaced by the annual appropriation.

### **Debt Service Assessments**

New Jersey Environmental Infrastructure Financing Program Debt Service Assessment – D&R Canal Dredging, Round Valley Structure Refurbishment – Rehabilitation and Preservation Project – Spruce Run Grouting and Spillway Improvements

The Authority has issued permanent financing through the New Jersey Infrastructure Bank (NJIB) loan program for the dredging of a 10.5-mile segment of the Delaware and Raritan Canal (D&R Canal) between Kingston at Lincoln Highway to Amwell Road in Franklin Township, Somerset County, New Jersey. This project was originally authorized for \$45,000,000; the final loan amount is approximately \$36,000,000 because the actual project total cost was lower than anticipated. Funding through the NJIB allows a portion of the loan to be at zero interest and a portion of the loan to be at market rate with the blended rate at favorable terms. The Authority has also submitted an application to the NJIB to finance the refurbishment of structures at the Round Valley Reservoir complex in Clinton Township, Hunterdon County, New Jersey. This project is expected to cost approximately \$75,000,000 and last in duration for several years. Funding through the NJIB would allow a portion of the loan to be at zero interest and a portion of the loan to be at market rate with the blended rate at favorable terms. Interim loans for the project closed in June 2019 and July 2020. Additionally, the Authority has begun embankment and spillway improvement projects at the Spruce Run Reservoir and expects to submit applications with the NJIB for financing of these projects. The Authority proposes increasing the rate component from \$85.00 per million gallons to \$109.00 per million gallons in FY2024 to ensure that sufficient funds are available to make debt service payments for these projects. The total rate component will be adjusted after the bonds for all projects are issued in accordance with final debt service schedules.

### **Capital Fund Component for Current Financing of Capital Improvement Program**

During the period from 1982-1993 the Authority had invested \$62,000,000 in the Capital Improvement Program for the Raritan Basin System. Much of this effort was the direct result of inadequate investments in the facilities during the years preceding the creation of the Authority. These Capital Improvement Programs were financed through the issuance of two long-term debt obligations, the 1981 Water Supply Bond Funds and 1988 Water System Revenue Bonds.

In 1995, the Authority began preparing a rolling five-year Capital Improvement Program, which required the investment of approximately \$1,500,000 per year. Current estimates place the necessary annual investment between \$2,500,000 and \$5,500,000. In evaluating options for financing this program (and subsequent five-year CIP's) the Authority looked at (1) the continuation of the practice of incurring long-term debt through the issuance of Revenue Bonds and (2) the possibility of current financing through the assessment of annual charges as part of our rate structures. The Authority concluded at the time that financing of such a small annual Capital Improvement Program based upon the issuance of long-term debt was fiscally imprudent. The Authority reevaluates this financing methodology on an annual basis.

The Authority's financial plan was predicated upon the establishment of a Capital Fund Component of \$10 per mg starting on July 1, 1994 with subsequent increases in this component of the total rate structure to \$15 per mg effective July 1, 1995 and to \$20 per mg effective July 1, 1996 and to \$25 per mg effective on July 1, 1998. Since then, the annual rate component has fluctuated between \$20 and \$35.

This level of current financing for reinvestments in plant and equipment somewhat

exceeds the booked depreciation of the plant and equipment for the Raritan Basin System facilities (without the depreciation of the dams), which amounts to about \$1,900,000 per year. Any future unplanned or unanticipated major capital investment may, however, require the issuance of long-term debt. Any future planned activity that increases the System capacity will be financed using long-term debt.

For FY2024, the Authority continues to believe the use of internally generated funds for such capital improvements is the least cost method of financing.

The Authority has determined that a Capital Fund Component of \$33.00 per million gallons, no change versus FY2023, should be assessed for FY2024 to generate approximately \$2,196,273. The Authority deems these revenues sufficient to meet its capital needs for FY2024 in light of existing capital reserves and project scheduling, and to ensure that sufficient funds are committed to the continuing rehabilitation of Authority assets.

### **Source Water Protection Fund Component for the Protection of Water Quality**

The Authority established its Watershed Protection Unit in 1999 to implement a watershed management program for the Raritan River Basin pursuant to a Memorandum of Agreement with the New Jersey Department of Environmental Protection. Primary functions of the Unit are planning for watershed protection and development and implementation of projects that improve protection of water supply.

As a component of the Authority's watershed protection initiative, the Authority established the Source Water Protection Fund in August of 2001 for the purpose of protecting the quality and quantity of waters in the Raritan Basin System. The first \$5.00 per million gallons of the component is used for three purposes in cooperation with federal, State, local and nonprofit partners: (1) administrative actions associated with the acquisition of critical watershed parcels in the Raritan Highlands; (2) planning assistance to improve management of land development by municipal, county and State government to protect both water quality and flows to and within Authority facilities; and (3) water quality characterization and associated remedial projects to preserve and enhance water quality.

In light of the rapid decline in available watershed parcels, and the critical value of these parcels to the sustained supply of water in the Raritan Basin System, the Authority increased the Source Water Protection Fund by \$5.00 per million gallons in FY2004 and again by \$3.00 per million gallons in FY2006, to acquire fee and other interests in critical watershed parcels in the System and rehabilitate properties to maximize benefit to water quality and quantity. To date, more than 3,954 acres of property have been preserved by the Authority and its partners. Some of the watershed and water quality projects include a tributary and storm water assessment of the D&R Canal to determine sediment loading, followed by an implementation project; the development of storm water management plans for a variety of tributaries in the Basin; a stream restoration project of a reach of the Mulhockaway which feeds into Spruce Run, and implementation of improved land management practices within the agricultural community. The Authority increased the Source Water Protection Rate from \$13.00 per million gallons to \$15.00

per million gallons in FY2008 to further support direct watershed protection and restoration projects. The Authority increased the Source Water Protection Rate from \$15.00 per million gallons to \$24.00 per million gallons in FY2014 to support debt service on previously acquired critical watershed parcels. The Authority is proposing a \$4 per million gallon reduction in the Source Water Protection Rate for FY2024 to mitigate the overall rate increase. The retirement of debt issued to fund the land acquisition programs will begin in 2023; the first land parcel was acquired in 2003 and was financed by a twenty-year bond. In combination with the balance in the Source Water Protection fund, the Authority is confident that there will be sufficient reserves in 2024 to fund the various Source Water Protection initiatives. The Authority anticipates that the reduction in the Source Water Protection rate will be a temporary one, and will continue to evaluate this rate component to ensure adequate funding of these important source water protection measures.

### **Other Rule Amendments**

The Authority is adding three items (paragliding, paramotoring, and operation of unmanned aircraft systems) to the list of activities prohibited on Authority property without a written permit. The language supporting the overall proposal is contained beginning on page 65 of this document.

**PART II – DETAILED SUPPORTING INFORMATION**

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Table 1 - Summary Of Proposed Fiscal Year 2024 Adjustments  
Based On Present Usage**

The rates, charges and debt service assessments listed below shall be paid for raw water diverted, withdrawn or allocated from the Raritan Basin System:

RATE COMPONENT	CURRENT	ORIGINAL PROPOSAL 11/07/22	DIFFERENCE	PERCENTAGE INCREASE (DECREASE)
O & M Assessment	\$194.00	\$203.00	\$9.00	4.6%
Debt Service Assessment Dredging/ RV Structure Refurbishment/Spruce Run	85.00	109.00	24.00	28.2%
Capital Fund Component	33.00	33.00	0.00	0.0%
Source Water Protection Component	24.00	20.00	-4.00	-16.7%
Total Rate	\$336.00/mg	\$365.00/mg	\$29.00/mg	8.6%

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Table 2 - Rate History of Water Charges per Million Gallons of Raw Water Daily**  
Fiscal Year 2007 – Fiscal Year 2024

Effective Date	O&M Charge	1981 Bond Charge 7/1/86-10/30/06	1998 Bond Charge 8/1/98-11/1/13	NJEIFP/NJIB Debt Component	Capital Fund Component	Source Water Protection Component	Total Charge per MG	Percent Increase -Decrease
July 1, 2006	133.13	19.55	41.32		21.00	13.00	228.00	6.05%
July 1, 2007	138.71		41.29		33.00	15.00	228.00	0.00%
July 1, 2008	142.34		40.66		33.00	15.00	231.00	1.32%
July 1, 2009	142.39		40.61		33.00	15.00	231.00	0.00%
July 1, 2010	142.55		40.45		33.00	15.00	231.00	0.00%
July 1, 2011	145.66		40.34		30.00	15.00	231.00	0.00%
July 1, 2012	145.84		40.16		30.00	15.00	231.00	0.00%
July 1, 2013	152.00			25.00	30.00	24.00	231.00	0.00%
July 1, 2014	167.00			25.00	30.00	24.00	246.00	6.49%
July 1, 2015	171.00			25.00	33.00	24.00	253.00	2.85%
July 1, 2016	171.00			25.00	33.00	24.00	253.00	0.00%
July 1, 2017	194.00			85.00	33.00	24.00	336.00	32.81%
July 1, 2018	194.00			85.00	33.00	24.00	336.00	0.00%
July 1, 2019	194.00			85.00	33.00	24.00	336.00	0.00%
July 1, 2020	194.00			85.00	33.00	24.00	336.00	0.00%
July 1, 2021	194.00			85.00	33.00	24.00	336.00	0.00%
July 1, 2022	194.00			85.00	33.00	24.00	336.00	0.00%
July 1, 2023	203.00			109.00	33.00	20.00	365.00	8.63%

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYTEM

**Schedule Of Events**

(NJAC 7:11-2.1 et. seq.)

To become effective July 1, 2023

**2022**

- SEPTEMBER 27 Advise Water Users of informal meeting.
- OCTOBER 28 Informal meeting with Water Users – 10:00 AM.
- NOVEMBER 7 Board reviews and approves proposed Rates.
- DECEMBER 18 Mail Official Notice to water customers, Rate Payer Advocate, interested parties and advertise in newspapers.

**2023**

- JANUARY 3 Publication in the New Jersey Register.
- 6 Pre-Public Hearing – 10:00 AM (within 45 days of Official Notice). Deadline for responses to inquiries received prior to pre-public hearing.
- 30 Deadline for receipt of comments to be addressed at Public Hearing (15 days after pre-public hearing).
- FEBRUARY 3 Public Hearing Meeting. (SR Administration Building) – 10:00 AM Deadline for responses to inquiries received between pre-public and public hearing.
- 16 Written responses to questions raised at Hearing (within 10 business days of the public hearing).
- MARCH 4 NJ Register Comment Period Ends.
- 13 Public Hearing record closes (25 business days after Public Hearing).
- MAY 1 Board approval of FY2024 Rates & Budgets
- JULY 1 Effective date.

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Proposed**

**Fiscal Year 2024 Budget Summary**

(7/1/23 - 6/30/24)

	ADOPTED F/Y23	PROPOSED F/Y24
Proposed Operating Expense Budget (Schedule 1)	\$ 14,730,184	\$ 15,968,713
Net Allocation of Headquarters General and Administrative Expenses to the Manasquan Water Supply System - (Schedule 5)	\$ (749,000)	\$ (893,000)
Proposed Total Expense Budget	\$ 13,981,184	\$ 15,075,713
Proposed Capital Equipment Budget (Schedule 6)	\$ 29,738	\$ 67,296
Total Operating Expense & Capital Equipment Budgets	\$ 14,010,922	\$ 15,143,009
Contribution to Reserve Funds		
- Other Post Employment Benefits Reserve	\$ -	\$ -
- Reserve for Formal Dam Inspection	\$ 10,000	\$ 10,000
- Pumping Reserve	\$ 150,000	\$ 150,000
- Capital Equipment Reserve	\$ 150,000	\$ 150,000
Total Budget Requirements	\$ 14,320,922	\$ 15,453,009
<u>MISCELLANEOUS REVENUES:</u>		
Employee Housing/Land Rental	\$ (47,200)	\$ (47,200)
	\$ (22,000)	\$ (84,400)
	\$ (69,200)	\$ (131,600)
<u>OTHER AVAILABLE FUNDS:</u>		
Unanticipated Revenue (Schedule 8)	\$ (1,286,340)	\$ (1,862,950)
Total Other Available Funds	\$ (1,286,340)	\$ (1,862,950)
Net Amount to be paid for O & M Component	\$ 12,965,382	\$ 13,458,459

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 1 - Proposed Operating Expenses Budget – Fiscal Year 2024 Distributed by Cost Center**  
Fiscal Year 2024

CODE	ACCOUNT	OFFICE EXECUTIVE DIRECTOR	FINANCIAL MANAGEMENT & ACCOUNTING	WATERSHED PROTECTION PROGRAMS	OPERATIONS MAINTENANCE & ENGINEERING	PROPOSED BUDGET FOR FY24
5110	Regular Salaries & Wages	\$160,800	\$1,988,250	\$750,000	\$4,124,400	\$7,023,450
5120	Overtime-Salaries & Wages	0	124,800	0	131,600	256,400
5130	New Positions-Salaries & Wages	0	0	0	0	0
5140	Seasonal Help-Salaries & Wages	0	0	0	0	0
5150	Fringe Benefits	37,600	996,300	315,200	2,404,500	3,753,600
5167	Retiree Health Benefits	38,800	195,800	9,100	487,500	731,200
5168	Workers Compensation (Self-Insured)	0	10,000	0	0	10,000
	Total Salary & Fringe Benefits	\$237,200	\$3,315,150	\$1,074,300	\$7,148,000	\$11,774,650
5200	On-Site Residences	\$0	\$0	\$0	\$19,600	\$19,600
5210	Heating Fuel	0	0	0	159,500	159,500
5220	Utilities -Electrical Service	0	0	0	108,600	108,600
5230	" -Gas Service & Water	0	0	0	5,900	5,900
5240	" -Propane	0	0	0	500	500
5250	Electricity for Pumping	0	0	0	87,000	87,000
5260	Vehicular Fuel	0	222,000	0	0	222,000
5270	Oil & Grease	0	0	0	17,500	17,500
5280	Tires	0	0	0	24,000	24,000
5290	Maintenance Supplies	0	6,800	0	182,900	189,700
5300	Maint. Supplies - Vehicular Equipment	0	0	0	65,000	65,000
5310	Major Special Vehicle Service & Repair	0	0	0	85,000	85,000
5320	Agricultural Supplies	0	500	250	10,000	10,750
5330	Maintenance of Equipment	0	8,300	8,000	49,300	65,600
5340	Service & Maintenance Contracts	0	139,820	636	246,140	386,596
5350	Equipment Rental	0	15,393	0	38,300	53,693
5360	Household-Safety & Protective Supplies	100	27,240	0	15,400	42,740
5370	Uniforms	0	5,400	0	4,260	9,660
5380	Special & Professional Services	23,000	246,578	282,468	210,836	762,882
5390	Protective Services	0	1,503,671	0	0	1,503,671
5400	Telephone	0	40,000	0	3,600	43,600
5410	Postage & Freight	0	7,500	0	120	7,620
5420	Data Processing	0	27,420	0	0	27,420
5430	Printing & Office Supplies	1,000	23,350	3,000	9,600	36,950
5440	Scientific & Photographic	0	0	6,000	500	6,500
5450	Dues & Subscriptions	15,100	10,490	400	14,700	40,690
5460	Advertising	0	7,500	3,500	200	11,200
5470	Travel & Subsistence	1,500	2,080	1,500	1,600	6,680
5480	Staff Training & Tuition Aid	500	15,200	3,500	22,500	41,700
5490	Fees & Permits	0	115,761	0	17,350	133,111
5500	In-Lieu Taxes	0	18,700	0	0	18,700
	Total Operating Expenses	\$41,200	\$2,443,703	\$309,254	\$1,399,906	\$4,194,063
	<b>GRAND TOTAL</b>	<b>\$278,400</b>	<b>\$5,758,853</b>	<b>\$1,383,554</b>	<b>\$8,547,906</b>	<b>\$15,968,713</b>

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 1A - Comparative Statement**  
Fiscal Year 2024

CODE	ACCOUNT	FY'20 ACTUAL	FY'21 ACTUAL	FY'22 ACTUAL	FY'23 ADOPTED	FY'24 PROPOSED
5110	Regular Salaries & Wages	\$6,020,542	\$5,887,597	\$6,220,845	\$6,912,300	\$7,023,450
5120	Overtime-Salaries & Wages	151,734	209,809	224,347	249,034	256,400
5130	New positions-Salaries & Wages	0	0	0	0	0
5162	Retiree Unused Sick & Vacation	0	0	0	0	0
5150	Fringe Benefits*	3,178,400	814,296	2,881,719	3,306,100	3,753,600
5167	Retiree Health Benefits	(433,886)	(315,911)	631,394	676,000	731,200
5168	Workers Comp. (Self Insured)	3,311	0	10,000	10,000	10,000
Total Salary & Fringe		8,920,101	6,595,791	9,968,305	11,153,434	11,774,650
Budget Salary & Fringe						
5200	Residences	\$18,485	\$17,096	\$20,854	\$19,600	\$19,600
5210	Heating Fuel	47,955	56,739	95,642	74,250	159,500
5220	Utilities -Electrical Service	98,579	110,014	122,051	103,300	108,600
5230	-Gas Service	4,997	5,665	5,661	7,700	5,900
5240	-Propane	219	244	0	500	500
5250	Electricity for Pumping Station	55,878	58,927	70,334	83,400	87,000
5260	Fuel - Vehicular	77,299	77,029	156,251	120,030	222,000
5270	Oil & Grease	7,787	8,996	8,049	13,000	17,500
5280	Tires	25,046	20,564	23,398	24,000	24,000
5290	Maintenance Supplies	166,538	154,004	166,595	199,000	189,700
5300	Maint. Supplies - Vehicular	46,362	51,228	67,914	59,000	65,000
5310	Major Vehicle Service & Repair	68,448	70,862	43,039	85,000	85,000
5320	Agricultural Supplies	5,004	7,516	4,851	9,750	10,750
5330	Maintenance Equipment	43,132	27,023	40,549	72,700	65,600
5340	Serv. & Maintenance Contracts	252,173	222,655	291,030	344,096	386,596
5350	Equipment Rental	56,110	36,896	31,101	61,650	53,693
5360	Household - Safety Supplies	35,372	41,993	39,723	40,600	42,740
5370	Uniforms	6,233	7,856	5,995	9,360	9,660
5380	Special & Professional Services	442,967	549,634	684,138	574,736	762,882
5390	Protective Services	1,194,269	1,130,377	1,264,101	1,303,793	1,503,671
5400	Telephone	58,899	51,862	51,731	47,200	43,600
5410	Postage & Freight Out	3,005	7,656	8,107	5,620	7,620
5420	Data Processing	24,451	25,156	26,188	27,420	27,420
5430	Printing & Office Supplies	32,114	32,383	49,538	46,050	36,950
5440	Scientific & Photographic	4,194	1,627	8,701	5,500	6,500
5450	Dues & Subscriptions	35,716	28,891	42,138	42,165	40,690
5460	Advertising & Promotional	10,156	8,822	3,517	10,700	11,200
5470	Travel & Subsistence	4,080	741	1,348	6,680	6,680
5480	Staff Training & Tuition Aid	15,140	11,461	15,059	30,350	41,700
5490	Fees & Permits	117,155	126,875	121,919	130,900	133,111
5500	In - Lieu Taxes	28,675	18,689	18,689	18,700	18,700
Total Other Expenses		\$2,986,441	\$2,969,482	\$3,488,212	\$3,576,750	\$4,194,063
Total Operating Expenses		\$11,906,541	\$9,565,274	\$13,456,518	\$14,730,184	\$15,968,713
Annual Increase (Decrease)		-13.59%	-30.58%	-2.33%	9.47%	8.41%
Budget -other expenses		3,540,285	3,522,437	3,526,581	3,572,690	3,572,690
ANNUAL BUDGET		\$14,211,138	\$13,936,857	\$14,298,436	\$14,730,184	\$15,968,713

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 2 - List of Category 5340 Items Recommended Service & Maintenance Contracts**  
Fiscal Year 2024

	ADOPTED F/Y23	PROPOSED F/Y24
1. Postage/Fax/ Misc. Machines (Dept. 16)	\$ 500	\$ 1,050
2. Wide Copier (Dept. 16)	-	900
3. SHPERA-Safety Software (Dept. 17)	2,000	2,200
4. Comodo- Remote Access Certificates (Dept. 17)	300	300
5. WMWARE (Dept. 17)	500	1,000
6. Sage Clients First MAS 100 (Dept. 17)	5,300	6,000
7. Property Fax - Parcel Maps (Dept. 17)	1,400	1,400
8. Sage Fixed Asset (Dept. 17)	2,900	3,400
9. PV & Associates-Winslamm (Dept. 17)	500	-
10. Digicert Certificate (Dept. 17)	-	950
11. People Trak Support Technical Difference (Dept. 17)	500	1,600
12. COMCAST - Cable Internet (Dept. 17)	15,000	20,000
13. Essention - Conservation Trak (Dept. 17)	5,000	-
14. Dendroyka - Landscape Software (Dept. 17)	-	2,000
15. Weebly (Web Hosting at Clinton) (Dept. 17)	250	250
16. Square Space (Web Hosting Watershed) (Dept. 17)	250	250
17. Symantec Anti-Virus Maintenance-Clinton (Dept. 17)	2,500	2,500
18. Sonic Wall Software (Dept. 17)	1,500	1,500
19. ESRI ArcView Maintenance-Watershed (Dept. 17)	5,400	5,400
20. KNOWBE4 Internet Security (Dept. 17)	1,500	1,500
21. Proofpoint Antispam (Dept. 17)	1,500	1,800
22. River Morph (Dept. 17)	500	-
23. Dossier Fleet Maintenance (Dept. 17)	-	9,700
24. DLT Solutions Autocad (Dept. 17)	2,800	2,800
25. Fastrax SBPS Monitoring Software (Dept. 17)	900	900
26. ESRI ArcView Maintenance-Clinton (Dept. 17)	500	500
27. Keystone Precision-GPS Software Maint. (Dept. 17)	800	600
28. HAAS Systems-Security Alarm Software Maint. (Dept. 17)	400	-
29. DATTO SAAS Protection (Dept. 17)	-	2,400
30. Clients First-Vipre Antivirus/Antispam (Dept. 17)	400	400
31. EZ Watch Security Video (Dept. 17)	900	900
32. Clients First - Server Software (Dept. 17)	1,000	1,000
33. Delmar Enterprises - Key Systems (Dept. 17)	520	520
34. Docusign (Dept. 17)	400	400
35. Microsoft 365 (Dept. 17)	18,000	14,800
36. Backup Service (Dept. 17)	6,000	8,500
37. MFA Service (Dept. 17)	1,500	3,900
38. Drivestrike Laptop Protection (Dept. 17)	-	600
39. Webtitan Laptop Software (Dept. 17)	-	600
40. Gasboy (Dept. 17)	-	5,500
41. Wix for Web (Dept. 20)	156	156
42. Trimble Catalyst for GPS (Dept. 20)	-	480
43. Trimble Catalyst for GPS (Dept. 30)	500	500
44. Refuse Collection (Dept. 31)	7,500	7,500
45. Janitorial Service (Dept. 31)	32,000	33,600

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NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 2 (Cont.) - List of Category 5340 Items Recommended Service & Maintenance Contracts**  
Fiscal Year 2024

	ADOPTED F/Y23	PROPOSED F/Y24
46. HVAC Service (Dept. 31)	\$ 5,500	\$ 5,500
47. Electrician & Plumber Services (Dept. 31)	5,000	5,000
48. Instrumentation Services (Dept. 31)	4,500	4,500
49. Entry Rugs (Dept. 31)	5,000	5,000
50. Carpet Cleaning (Dept. 31)	10,000	10,000
51. Generator Service-Administration Building (Dept. 31)	1,200	1,200
52. Underground Plant Location Service Notifications (Dept. 31)	1,500	1,500
53. Crane Service and Inspection (Dept. 31)	4,000	4,000
54. Elevator Service-SBPS (Dept. 31)	2,800	2,800
55. Electrical Service-SBPS (Dept. 31)	20,000	20,000
56. UST Testing and Inspections (Dept. 31)	15,000	20,000
57. Miscellaneous (Dept. 31)	6,900	6,900
58. Janitorial Service (Dept. 32)	15,600	15,600
59. Dumpster Service Canal Office (Dept. 32)	21,400	30,000
60. Dumpster Service Route 1 (Dept. 32)	43,000	43,000
61. Instrumentation Service (Dept. 32)	3,000	3,000
62. One Call Concepts (Dept. 32)	2,400	2,400
63. AST Environmental (Dept. 32)	-	3,120
64. HVAC (Dept. 32)	4,000	4,000
65. Wood Disposal Fees (Dept. 32)	4,800	4,800
66. Generator Service-Scudders & Perdicaris (Dept. 32)	3,000	3,000
67. Viking Pest (Dept. 32)	720	720
68. Johnny on the Spot - Rt. 202 (Dept. 32)	2,400	2,400
69. Welco Gas (Dept. 33)	1,000	1,000
70. Tree Stump Recycling (Dept. 33)	2,500	2,500
71. Parts Washer & Hazardous Removal (Dept. 34)	1,000	1,000
72. Boom Lift Annual Inspection (Dept. 34)	900	1,200
73. Recycle Used Vehicle Fluids (Dept. 35)	400	400
74. Fire Extinguisher Maintenance (Dept. 36)	9,000	10,800
75. Hazardous Waste Control (Dept. 36)	1,500	1,500
76. Fire Alarm Testing (Dept. 36)	8,000	10,000
77. Vehicle Lifts Annual Testing (Dept. 36)	1,500	1,500
78. Delaware Electric Cellular Service (Dept. 37)	1,000	1,200
79. Dial My Calls (Dept. 37)	1,600	-
80. Emergency Notification System (Dept. 37)	-	3,600
81. GPS Tracking (Dept. 37)	1,200	1,600
82. Covert Wireless (Dept. 37)	1,200	1,600
<b>TOTAL</b>	<b>\$ 334,096</b>	<b>\$ 386,596</b>

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 3 - List of Category 5380 Items Recommended Professional Services**  
Fiscal Year 2024

	ADOPTED F/Y23	PROPOSED F/Y24
Services-Governor's Authorities Unit (Dept. 10)	\$ 23,000	\$ 23,000
Consultant-C.P.A. to Conduct Annual Audit (Dept. 13)	55,000	60,300
125 Plan-Family security Insurance Agency (Dept. 13)	2,730	2,730
Archiving (Dept. 13)	6,000	6,000
NJEIT Fee (Dept. 13)	-	25,000
Services-Pre-Employment Exams & Tests (Dept. 14)	3,300	3,300
Fidelifax-Background Checks (Dept. 14)	2,248	2,248
Medical CDL Drug Testing (Dept. 14)	2,400	2,400
Employee Advisory Service (Dept. 14)	2,700	2,700
Consultant-Risk Management - to provide assistance to the Authority in the review of insurance coverage and continuation of a Comprehensive Coordinated Risk Management Program (Dept. 15)	45,000	45,000
Insurance Broker-HRH (Dept. 15)	45,000	45,000
GL Administrator (ESIS) (Dept. 15)	3,000	5,000
Services-Attorney General's Office - Assistance of Deputy Attorney General concerning a wide range of legal matters (Dept. 15)	25,000	30,000
MP Water Monitoring Costs - USGS SR @ Glen Gardner (Dept. 20)	10,057	13,117
MP Water Monitoring Costs - USGS SB Raritan @ Stanton (Dept. 20)	8,568	11,429
MP Water Monitoring Costs - USGS Landing Lane (Dept. 20)	36,414	72,405
MP Water Monitoring Costs - USGS Raritan River @ Manville (Dept. 20)	47,940	106,395
Continuous Record Gaging - USGS @ Washington Crossing (Dept. 20)	22,083	23,802
Water Quality Monitoring - USGS @ Washington Crossing (Dept. 20)	5,059	4,672
Water Monitoring Costs ASWQMN- USGS D&R Canal @ Landing Lane (Dept. 20)	13,617	15,326
Water Monitoring Costs ASWQMN - NJDEP Mulhockaway @ Van Syckel (Dept. 20)	7,320	9,022
Additional Flow Measure at SR, Stanton, Manville & Calco Dam (Dept. 20)	8,500	8,500
Water Monitoring-SBWA/URWA now RHA (Dept. 20)	2,000	2,000
Water Monitoring-SBMWA (Dept. 20)	1,500	1,500

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NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 3 (Cont.) - List of Category 5380 Items Recommended Professional Services**

Fiscal Year 2024

	ADOPTED F/Y23	PROPOSED F/Y24
Lab Certification WPU/Water Sample Analysis (Dept. 20)	\$ 2,000	\$ 2,000
NJ Invasive Species Strike Team (Dept. 20)	300	300
ISCO Monitoring (Dept. 20)	8,000	8,000
General Lab Analysis (Dept. 20)	4,000	4,000
Services-Emergency Engineering Services (Dept 30)	17,500	15,000
USGS Cooperative Agreement River Gaging - Maintenance of Raritan Basin Stream Gaging Stations and the Delaware & Raritan Canal Gauging at Kingston per USGS/DWR/NJWSA Agreement (Dept. 31)	68,000	93,636
USGS Spruce Run Gage at Glen Gardner (Dept. 31)	10,200	11,200
USGS Clinton Rain Gage (Dept. 31)	3,200	3,000
USGS Washington Crossing Rain Gage (Dept. 31)	3,200	3,000
Water Testing and Sampling to comply with the Safe Water Drinking Act (Dept. 31)	5,000	20,000
Water Sampling and Testing as per NJDWR Requirements - RT 202 Stockpile Site (Dept 32)	28,000	30,000
Maintenance of USGS Gauges at Washington Crossing and 10-mile and others (Dept. 32)	25,000	30,000
Vac Truck Service - IFW, 10 Mile PS (Dept. 32)	5,000	5,000
Safety Suggestion Program, Poster and Promotional Materials, Safety Incentive Program (Dept. 36)	9,700	9,700
Pulmonary Testing and Physicals (Dept. 36)	5,000	5,000
Annual Contributions to Fire Companies and Rescue Squads (Dept. 36)	500	500
Hepatitis Vaccinations (Dept. 36)	800	800
Calibration for the Pota-Count Respirator (Dept. 36)	900	900
<b>TOTAL</b>	<b><u>\$ 574,736</u></b>	<b><u>\$ 762,882</u></b>

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 4 - Projected FY 2024 New Jersey Water Supply Authority Insurance Program**

<u>Policy</u>	<u>Raritan Basin System</u>	<u>Manasquan Reservoir System</u>	<u>Manasquan Water Treatment Plant and Transmission System</u>	<u>Total Premium</u>
<b>Property</b> Limit \$150 million, Limit \$25m BI  Deduct: \$100k all perils \$250k Deduct dams, dikes / \$1m Deduct Canal flood Earthen Dam:Builders Risk	\$680,659	\$297,032	\$87,346	\$1,065,037
<b>General/Products Liability</b> Limit \$1 million Deduct: \$150k	\$159,096	\$14,874	\$3,088	\$177,058
<b>Environmental Impairment Liability</b> Limit \$10 million Deduct: \$100k	\$26,125	\$2,443	\$507	\$29,075
<b>Workers' Compensation</b> Limit \$1 million	\$121,925	\$17,972	\$19,469	\$159,366
<b>Employer Liability</b> Limit \$1 million	Included in Workers' Comp	Included in Workers' Comp	Included in Workers' Comp	Included in Workers' Comp
<b>Umbrella Liability</b> Limit \$23 million	\$402,471	\$37,628	\$7,813	\$447,912
<b>Business Automobile</b> Limit: \$1 million G/L, \$0 pd Deduct: \$50k, G/L	\$35,064	\$4,709	\$1,571	\$41,344
<b>Management Liability</b> Public Officials Liability Cyber Risk Fidelity & Crime Limit \$5 million/\$1 million/\$1 million Deduct: \$100k/\$10k/\$50k	\$46,856 \$24,686 \$71,542	\$4,380 \$2,308 \$6,688	\$910 \$478 \$3,844 \$5,232	\$52,146 \$27,472 \$3,844 \$83,462
<b>Travel Accident</b> Limit \$2 million	\$742	\$69	\$14	\$825
<b>Drone Coverage</b>	\$1,188			\$1,188
<b>UST</b>	\$4,858			\$4,858
<b>TOTAL:</b>	\$1,503,670	\$381,415	\$125,040	\$2,010,125

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 5 - Recap Of Allocation Of Headquarters General And Administrative Expenses Charged  
To The Manasquan Water Supply System**  
Fiscal Year 2024 (7/1/23-6/30/24)

	<b>Total Headquarters Charge</b>	<b>Manasquan Reservoir System</b>	<b>Manasquan WTP/TS</b>
Budgeted-Appendix I, amount to be charged to Manasquan System for FY24 (7/1/23-6/30/24)	\$810,833	\$699,506	\$111,327
F/Y22 Adjustment as per audited Expenditures:			
Budgeted as per rate schedule for F/Y22 (7/1/21-6/30/22). Amounts paid during F/Y22 to Raritan Basin System.	\$675,000	\$583,000	\$92,000
Actual allocation based upon audited expenditures F/Y22 (7/1/21-6/30/22) - Appendix II	<u>\$757,050</u>	<u>\$653,089</u>	<u>\$103,961</u>
Adjustments F/Y22	<u>\$82,050</u>	<u>\$70,089</u>	<u>\$11,961</u>
Net Allocation for F/Y2024 Budget	<u>\$892,883</u>	<u>\$769,595</u>	<u>\$123,288</u>
Estimate	<u>\$893,000</u>	<u>\$770,000</u>	<u>\$124,000</u>

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 6 - Proposed Capital Equipment Budget**  
Fiscal Year 2024

	Description	Replacement (R) Addition (A)	Year of Purchase	Dollar Value	Depreciaton Reserve
<b>ENG/FACILITIES</b>					
	Gate Operators (3)	R		\$ 45,000	
	Current Year Pickup with Utility Body	R (2138)		\$ 75,000	\$ 34,763
	Radial/Slide Saw	R (104)		\$ 2,000	\$ 2,395
	Guardrail Tensioner	A		\$ 6,000	
	Portable Generator	A		\$ 3,000	
<b>GROUNDS</b>					
	"Billy Goat" Walk Behind Brush Cutter	A		\$ 6,000	
	Post Hole Drill Head for Power-Trac	A		\$ 4,000	
	Vermeer CTX 100 Mini Skid Steer	A		\$ 60,000	
	Vermeer Brush Grapple Attachment	A		\$ 6,000	
	Vermeer Rotating Log Grapple Attachment	A		\$ 7,000	
	Current Model Year Single Axle Dump Truck	R (2085)		\$ 200,000	\$ 89,063
<b>CANAL</b>					
	Low Bed 50T Trailer	R (1201)		\$ 125,000	\$ 35,987
	Excavator w/ thumb, winch & compactor	R (2249)		\$ 300,000	\$ 101,407
	Landscape dump w/ hook, dump box & chipper box	R (2089/2335)		\$ 120,000	\$ 56,947
	Wet Boxes (2)	R (1775 -49654/49655)		\$ 27,000	\$ 12,176
	Wheel loader	R (2049)		\$ 300,000	\$ 188,850
	WSO truck	R (2287)		\$ 45,000	\$ 14,931
<b>AUTO SHOP</b>					
	Miller 252 Mig Welder	R (1291)		\$ 8,000	\$ 2,667
	Snap-On Pass Thru Assistant	A		\$ 5,000	
	Turf kit adaptor for lift	A		\$ 7,300	
	Air compressor for NJWA50	A		\$ 5,000	
<b>IT/HR</b>					
	Dell Laptops (Damage/Loss - 2)	R		\$ 2,400	
	File cabinets	A		\$ 5,200	
<b>SECURITY</b>					
	Ford Explorer or equivalent	R (2379)		\$ 32,000	\$ 9,418
	BOSCH Conettix D6100 (Digital Alarm Receiver)			\$ 3,000	
	Door and Gate access card readers (17)			\$ 17,000	
				TOTAL COST	\$1,415,900 \$548,604
				LESS AMOUNT CHARGED TO DEPRECIATION RESERVE	(548,604)
				NET TOTAL	<u>\$867,296</u>
				LESS AMOUNT CHARGED TO CAPITAL EQUIPMENT RESERVE	(\$800,000)
				TOTAL	\$67,296

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 7 - Estimate Of Interest Income For Fiscal Year 2024 Budget**

Fund/Reserve	TD Bank Funds		
Operating	\$ 1,739,000		
Reserve for O & M	3,650,000		
Pumping Reserve	2,035,000		
Self-Insurance Reserve	932,000		
Rate Stabilization Fund	88,000		
Estimated Total	\$ 8,444,000		
	\$8,444,000	x 1.0% =	\$ 84,440
		Total	\$ 84,440
		Estimate	\$ 84,400

Note: Long-term investment earnings are being used to fund depreciation reserve.

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 8 - Unanticipated Revenue**

Funds to be appropriated Into the Rate Stabilization Fund for Fiscal Year 2024

		<u>Amount</u>
F/Y2022 Net Year-End Balance		\$800,000
Transfer from SWP fund		\$200,000
<u>Overdrafts</u>	<u>Invoice No.</u>	<u>Billed</u>
		<u>Amount</u>
Middlesex Water Co	R321	Nov-21
		\$13,258
Mt Olive Twp.	R328	Mar-22
		\$305
NJ American	R319	Nov-21
		\$85,962
NJ American	R329	Mar-22
		\$333,602
NJ American	R330	Apr-22
		\$429,411
Roxiticus	R322	Nov-21
		\$84
Stonebridge Community Assoc.	R320	Nov-21
		\$325
	Total	\$862,947
	NET	\$862,947
<u>Other Sources of Funds</u>		
	Grand Total	<u>\$1,862,947</u>
	FY24 Budget	<u>\$1,862,950</u>

NEW JERSEY WATER SUPPLY AUTHORITY  
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**Schedule 9 - Fund Balances as of 6/30/22**

\*\*Final\*\*

	REVENUE FUND	OPERATING ACCOUNT	OPERATING FUND	O & M RESERVE	LONG-TERM INVESTMENTS O & M RESERVE	TOTAL
BALANCE 6/30/22	\$ 485,715	\$ 2,124,625	\$ 1,739,046	\$ 3,650,364	\$ -	\$ 7,999,750
Add - Reimbursement from CIP for June outlays						-
Deduct: Accrued expenses to be paid as of 6/30/22			(176,174)			(176,174)
Deduct: June 1st billing, received			(462,108)			(462,108)
Adjusted Balances 6/30/22	\$ 485,715	\$ 2,124,625	\$ 1,100,764	\$ 3,650,364	\$ -	\$ 7,361,468
 INCOME						
Reimbursement Manasquan						
Receipt of Headquarters Overhead Expenses for 7/10/22			168,500			168,500
Operating transfer	(485,715)	(2,124,625)	2,610,340			-
 EXPENSES						
O & M Expenses - (A/P 6/30/22)						
Includes accrued Payroll thru 6/30/22			(348,961)			(348,961)
Capital items to be purchased by 6/30/22			(38,522)			(38,522)
Various Reserve contributions (one month)			-			-
PROJECTED BALANCE AT 6/30/22	\$ -	\$ -	\$ 3,492,121	\$ 3,650,364	\$ -	\$ 7,142,485

Less: O & M reserve balance (3 mos required by resolution) (3,689,981)

Adjusted balance of funds available 6/30/22 3,452,505

Use of Available Funds

Unanticipated revenues (overdrafts in FY22 to be available for appropriation to Rate Stabilization Fund for FY24) (862,947)

Rate Stabilization Fund Transfer for FY23 (1,286,340)

Projected Net Balance \$ 1,303,218

NEW JERSEY WATER SUPPLY AUTHORITY  
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**Schedule 10 - Projected Fiscal Year 2024 Operations & Maintenance Component  
and Debt Service Assessment Sales Base**

USER	DAILY ALLOCATION (MGD)	DAYS PER YEAR	TOTAL MG/YR	ANNUALIZED SALES BASE (MGD)
East Brunswick Twp	8.000	365	2,920.000	8.000
NJ American Water Company	126.600	365	46,209.000	126.600
Mercer County Park Commission – Golf	0.132	184	24.300	0.067
Middlesex Water Co.	27.000	365	9,855.000	27.000
New Brunswick, City of	10.500	365	3,832.500	10.500
North Brunswick Twp.	8.000	365	2,920.000	8.000
Princeton University PPL	0.150	365	54.750	0.150
Trenton Country Club	0.126	365	46.000	0.126
Suez Water Lambertville	0.490	365	178.850	0.490
Ridge at Back Brook	0.111	365	40.510	0.111
Roxbury Water Company	0.041	365	15.000	0.041
Royce Brook Golf Club	0.165	365	60.230	0.165
Hunterdon County Golf (Heron Glen)	0.079	365	28.800	0.079
Raritan Valley Country Club	0.012	365	4.380	0.012
East Windsor Municipal Utilities Authority	0.011	365	4.000	0.011
Somerset County Park Commission (Neshanic Valley Golf Club)	0.142	365	51.750	0.142

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 10 (Cont.) - Projected Fiscal Year 2024 Operations & Maintenance Component  
and Debt Service Assessment Sales Base**

USER	DAILY ALLOCATION (MGD)	DAYS PER YEAR	TOTAL MG/YR	ANNUALIZED SALES BASE (MGD)
Lamington Farms LLC (Trump National Golf Club)	0.170	365	62.100	0.170
Morris County Municipal Utilities Authority	0.079	365	28.830	0.079
Mt. Olive Township	0.010	365	3.554	0.010
Washington Township Municipal Utilities Authority	0.035	365	12.775	0.035
Borough of Glen Gardner	0.008	365	2.775	0.008
Roxiticus Golf Club	0.046	365	16.790	0.046
Hamilton Farm Golf Club	0.138	365	50.400	0.138
Springdale Golf Club	0.098	365	35.640	0.098
NJ Department of Corrections	0.025	365	9.250	0.025
Stonebridge Community Assoc.	0.081	365	29.565	0.081
Village Grande @ Bear Creek	0.074	365	27.010	0.074
Eastern Concrete Materials	0.023	365	8.500	0.023
Hunterdon Medical Center	0.031	365	11.000	0.031
Princeton University Operations	0.027	365	9.855	0.027
<b>TOTAL SALES BASE</b>				<b>182.339</b>

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 11 - Operations And Maintenance Rate Component**  
Fiscal Year 2024

Funds Required for FY2024 Budget

Proposed Operating Expense and Capital Budget	\$	15,453,009
Less Miscellaneous Revenues & Interest Income		(\$131,600)
Other Available Funds		(\$1,862,950)
Net Budget Requirement		\$13,458,459
Less: 182.339 x 194.00 x 61Days (Cash received in July and August for water used in May and June based on \$194.00/mg)		(\$2,157,800)
 Additional Revenue required to cover Operations and Maintenance Expense through 6/30/24		 \$11,300,659

Computation of Operations & Maintenance Rate for Fiscal Year 2024

Sales Base		
Period 7/1/23 to 4/30/24 305 days x 182.339 mgd	=	55,613.40 mg
 Required Operations & Maintenance Rate FY2024		
	$\frac{\$11,300,659 \text{ mg}}{55,613.40 \text{ mg}}$	= \$203.00 mg

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 12 - Debt Service Rate Component for NJEIFP Loan Repayment**

Debt Service Rate Component for NJIB Loan Repayment

Effective July 1, 2023 (FY2024, July 1, 2023-June 30, 2024)

Total due on Principal and Interest \$ 7,317,868 /year

$$\text{Debt Service Rate for NJIB Loan} = \frac{\$7,317,868}{182.339\text{mgd} \times 365 \text{ days}} = \$109.00 /\text{mg}$$

\*This rate may be subject to future adjustments based on actual loan terms.

**NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM**

**Schedule 13 - Capital Improvement Program  
Fiscal Years 2023-2027**

PROJECT	ESTIMATED	Period	Priority	Prior	\$33	\$33	\$33	\$33	\$45
	PROJECT	First			Years	FY	FY	FY	FY
	COST	Identified			2023	2024	2025	2026	2027
Rehabilitate Western Embankment Stockton Borough	\$ 4,000,000	2006	High	\$ 397,929	\$ 1,000,000	\$ 2,602,071			
Rehab Swan Creek Aqueduct New Project Includes Culvert Work	\$ 1,200,000	2015	High	\$ -			\$ 100,000	\$ 1,100,000	
Dam Imprints as Recommended by TRB (Preliminary Eng'g and Owner's Eng'g)	\$ 2,700,000	2013	High	\$ 2,373,864	\$ 75,000	\$ 251,136	\$ -		
RV Res Dams-Rehab & Resource Preservation Project (eng only) (bond)	\$ 5,900,000	2015	High	\$ -					
Round Valley Dam Improvements - Construction (bond)	\$ 65,000,000	2015	High	\$ -					
Construction Eng'g Mgmt for RV Dam Improvements (bond)	\$ 9,000,000	2015	High	\$ -					
Electrical Improvements at Round Valley Reservoir (bonded)	\$ 150,000		High						
Security Improvements at RV Reservoir (Cameras) (Not bonded)	\$ 1,200,000	2016	High	\$ -		\$ 300,000	\$ 900,000		
Security Improvements at RV and SR (Perimeter hardening) (Not bonded)	\$ 800,000	2017	High	\$ -	\$ 150,000	\$ 150,000	\$ 250,000	\$ 250,000	
Background Screening of Contractors and Consultants (Not bonded)	\$ 202,252		High	\$ 135,034	\$ 67,218				
Spruce Run Grouting (bond)	\$ 30,000,000		High						
Spruce Run Spillway Improvements (bond)	\$ 44,000,000		High						
New 2D Inundation Mapping for Round Valley and Spruce Run Reservoir	\$ 500,000	2015	High	\$ -			\$ 250,000	\$ 250,000	
Rehab of 6-Mile Run Culvert	\$ 1,675,183	2008	High	\$ 275,183	\$ 1,400,000				
Replace Fuel Dispenser and Software/inventory System at Spruce Run Adm.	\$ 250,000	2017	High	\$ 256,624	\$ (6,624)				
Replace Office Phone System - Authority Wide	\$ 80,000	2017	High	\$ -	\$ 80,000				
Refurbishment of the Main Pumps & Motors 4, 5, 7, & 8 with additional upgrades	\$ 9,000,000	2008	High	\$ 321,802	\$ 2,200,000	\$ 3,000,000	\$ 3,000,000	\$ 478,198	
Replace Boilers at Spruce Run Administration Building	\$ 175,000	2018	High			\$ 75,000	\$ 100,000		
Replace Water Storage Tanks in Spruce Run Administration Building Basement	\$ 100,000	2018	High		\$ 100,000				
Emergency Generator at Spruce Run Administration Building	\$ 400,000	2019	High		\$ 200,000	\$ 200,000			
SR Reservoir Multidisciplinary Release Works Improvements & Studies	\$ 4,000,000	2016	High	\$ 677,065	\$ 1,000,000	\$ 1,500,000	\$ 822,935		
Prallsville pit/spillway gates FEMA	\$ 300,000		High		\$ 100,000	\$ 200,000			
RV Sluice Gates	\$ 500,000		High		\$ 500,000				
Wastegate and Lock Evaluation and Repair - D&R Canal	\$ 603,656	2020	High	\$ 16,482			\$ 300,000	\$ 287,174	
	\$ 181,736,091								
Scudder Falls Wastegate Controls Improvement	\$ 75,000	2019	Med High				\$ 75,000		
Rehab of Upper Canal Embankment - Raven Rock to Prallsville	\$ 6,000,000	2006	Med High	\$ 136,983	\$ 300,000	\$ 1,800,000	\$ 1,500,000	\$ 2,263,017	
Rehabilitate Flow Control Gate on Back Race at Lambertville	\$ 150,000	2019	Med High			\$ 75,000	\$ 75,000		
Rehab of Canal Flow Control Structures	\$ 1,500,000	2000	Med High	\$ -	\$ 1,100,000	\$ 250,000			\$ 150,000
Rehab of Landing Lane Spillway and Rehab Slope Downstream of Island Farm	\$ 1,850,000	2013	Med High	\$ 456,096	\$ 1,393,904				
Repair of Pipe at Whitehead Road	\$ 500,000	2012	Med High	\$ -			\$ 250,000	\$ 250,000	
Rehabilitation Work at Washington Crossing Spillway	\$ 300,000	2012	Med High	\$ -				\$ 150,000	\$ 150,000
Security System and Upgrades (Clinton and Canal)	\$ 450,000	2003	Med High	\$ 44,760	\$ 100,000	\$ 100,000	\$ 50,000	\$ 50,000	\$ 105,240
Rooftop Hydronic Heater for Auto Shop - Spruce Run Admin.	\$ 50,000	2020	Med High		\$ 50,000				
	\$ 10,825,000								
Alexauken Creek Aqueduct	\$ 1,000,000	2015	Medium					\$ 500,000	\$ 500,000
Rebuild Stone Embankment at the 10 Mile Waste Gate and Rebuild Façade	\$ 200,000	1990	Medium			\$ 100,000	\$ 100,000		
Rehab of Spillway Upstream of Griggstown Lock	\$ -	2010	Medium						
Rehab of Culvert at Station 2550+90 (1 mile upstream of 10-mile)	\$ 700,000	2008	Medium						\$ 700,000
Replace Boiler at Canal Field Office	\$ 150,000	2019	Medium			\$ 150,000			
Replace Underground Heating Oil Tank at South Branch Pumping Station	\$ 300,000	2018	Medium		\$ 100,000	\$ 200,000			
Replace Underground Heating Oil Tank at SR Admin Building	\$ 300,000	2019	Medium		\$ 100,000	\$ 200,000			
Replace Underground Diesel and Gasoline Tanks at Spruce Run Admin Building	\$ 600,000	2019	Medium		\$ 100,000	\$ 500,000			
Spruce Run Administration Building Network Data Closet Construction	\$ 100,000	2019	Medium			\$ 100,000			
	\$ 3,350,000								
Rehab of Traprock Spillway	\$ -	2010	Low						
Dredging between Landing Lane and Route 18 - Engineering	\$ -	2007	Low						
Dredging of Canal Between Lambertville and Route 1	\$ -	2015	Low						
Dredging of Canal Between Amwell Road and 10 Mile	\$ -	2015	Low						
Storage Building at Canal Field Office	\$ -	2019	Low						
Spruce Run Administration Building Tie-in to Public Water Supply	\$ -	2018	Low						
Storage Building near Spruce Run Annex	\$ -	2018	Low						
Construction Bedload Stone Trap @ Wickecheoke Creek	\$ -	1995	Low						
Cutoff Wall in Shipetaukin Creek Guard Bank	\$ -	2005	Low						
Wickecheoke Creek Gates Abandonment	\$ -	2015	Low						
Rehab of Gold Run Spillway	\$ -	2008	Low						
Carnegie Lake Culverts Investigation / Isolation	\$ -	2015	Low						
Raven Rock Retaining Wall Downcanal of Lock	\$ -	2015	Low						
Refurbishment of the Main Pumps & Motors 3 & 9	\$ -	2015	Low						
Refurbishment of the Main Pumps & Motors 2 & 10	\$ -	2015	Low						
Canal Culvert Rehabilitation 2249+79 (Suydam)	\$ -	2015	Low						
Canal Culvert Rehabilitation 2661+86 (Randolph Brook)	\$ -	2015	Low						
Canal Culvert Rehabilitation 2992+34 (Mile Run Culvert)	\$ -	2015	Low						
Concrete Repairs at the Sullivan Way Aqueduct	\$ -	2007	Low						
Rehab of the Four Mile Spillway	\$ -	2010	Low						
Third Hand Shop Culvert under D&R Canal Cleaning (partially Clogged)	\$ -	2019	Low						
No-Name Culvert Under Canal Sta. 936+50 Outlet Cleaning (Part Clogged)	\$ -	2019	Low						
Pipeline Evaluation - Whitehouse Release Pipeline	\$ -	1990's	Low						
Pipeline Evaluation - RV Force Main	\$ -	1990's	Low						
<b>TOTAL</b>	<b>\$ 41,911,091</b>			<b>5,091,822</b>	<b>10,109,498</b>	<b>11,753,207</b>	<b>7,772,935</b>	<b>5,578,389</b>	<b>1,605,240</b>
<b>Balance CIP</b>				<b>24,800,000</b>	<b>16,886,775</b>	<b>7,329,842</b>	<b>1,753,180</b>	<b>(1,628,936)</b>	<b>(239,258)</b>

The estimated project costs listed includes engineering, cultural, construction and miscellaneous expenses.  
 Funds in CIP as of June 2022 @ \$19.6M, \$22.6M w/reimbursement that is due for FY22 work from Ibank \$ 24,800,000  
 Dredging/RV Project Debt Service Component Fund Balance also available for cost overruns in either project.  
 Spruce Run Improvements - An extensive improvement program including grouting and spillway repair is anticipated on an approximate 3-year timeline.

**RARITAN BASIN SYSTEM  
CAPITAL IMPROVEMENT PROGRAM  
Fiscal Years 2023 – 2027  
Updated – September 2022**

The following is a description of projects that the Authority anticipates being funded from the Capital Improvement Program (CIP) in Fiscal Years 2023 – 2027. Discussion also includes projects that may be delayed beyond FY 2026 due to funding.

PROJECT
Rehabilitate Western Embankment Stockton Borough
Rehab Swan Creek Aqueduct New Project Includes Culvert Work
Dam Improvements as Recommended by TRB (Preliminary Eng'g and Owner's Eng'r)
RV Res Dams-Rehab & Resource Preservation Project (eng only) (bond)
Round Valley Dam Improvements - Construction (bond)
Construction Eng'g Mgmt for RV Dam Improvements (bond)
Electrical Improvements at Round Valley Reservoir (bonded)
Security Improvements at RV Reservoir (Cameras) (Not bonded)
Security Improvements at RV and SR (Perimeter hardening) (Not bonded)
Background Screening of Contractors and Consultants (Not bonded)
Spruce Run Grouting (bond)
Spruce Run Spillway Improvements (bond)
New 2D Inundation Mapping for Round Valley and Spruce Run Reservoir
Rehab of 6-Mile Run Culvert
Replace Fuel Dispenser and Software/inventory System at Spruce Run Adm.
Replace Office Phone System - Authority Wide
Refurbishment of the Main Pumps & Motors 4, 5, 7, & 8 with additional upgrades (bond)
Replace Boilers at Spruce Run Administration Building
Replace Water Storage Tanks in Spruce Run Administration Building Basement
Emergency Generator at Spruce Run Administration Building
SR Reservoir Multidisciplinary Release Works Improvements & Studies
Prallsville pit/spillway gates FEMA
RV Sluice Gates
Wastegate and Lock Evaluation and Repair - D&R Canal

Scudder Falls Wastegate Controls Improvement
Rehab of Upper Canal Embankment - Raven Rock to Prallsville
Rehabilitate Flow Control Gate on Back Race at Lambertville
Rehab of Canal Flow Control Structures
Rehab of Landing Lane Spillway and Rehab Slope Downstream of Island Farm Weir
Repair of Pipe at Whitehead Road
Rehabilitation Work at Washington Crossing Spillway
Security System and Upgrades (Clinton and Canal)
Rooftop Hydronic Heater for Auto Shop - Spruce Run Admin.
Alexauken Creek Aqueduct
Rebuild Stone Embankment at the 10 Mile Waste Gate and Rebuild Façade
Rehab of Spillway Upstream of Griggstown Lock
Rehab of Culvert at Station 2550+90 (1 mile upstream of 10-mile)
Replace Boiler at Canal Field Office
Replace Underground Heating Oil Tank at South Branch Pumping Station
Replace Underground Heating Oil Tank at SR Admin Building
Replace Underground Diesel and Gasoline Tanks at Spruce Run Admin Building
Spruce Run Administration Building Network Data Closet Construction
Rehab of Traprock Spillway
Dredging between Landing Lane and Route 18 - Engineering
Dredging of Canal Between Lambertville and Route 1
Dredging of Canal Between Amwell Road and 10 Mile
Storage Building at Canal Field Office
Spruce Run Administration Building Tie-in to Public Water Supply
Storage Building near Spruce Run Annex
Construction Bedload Stone Trap @ Wickecheoke Creek
Cutoff Wall in Shipetaukin Creek Guard Bank
Wickecheoke Creek Gates Abandonment
Rehab of Gold Run Spillway
Carnegie Lake Culverts Investigation / Isolation
Raven Rock Retaining Wall Downcanal of Lock

Refurbishment of the Main Pumps & Motors 3 & 9
Refurbishment of the Main Pumps & Motors 2 & 10
Canal Culvert Rehabilitation 2249+79 (Suydam)
Canal Culvert Rehabilitation 2661+86 (Randolph Brook)
Canal Culvert Rehabilitation 2992+34 (Mile Run Culvert)
Concrete Repairs at the Sullivan Way Aqueduct
Rehab of the Four Mile Spillway
Third Hand Shop Culvert under D&R Canal Cleaning (partially Clogged)
No-Name Culvert Under Canal Sta. 936+50 Outlet Cleaning (Part Clogged)
Pipeline Evaluation - Whitehouse Release Pipeline
Pipeline Evaluation - RV Force Main

### **Rehabilitation of the Canal Western Embankment, Stockton Borough**

The one-mile long reach of the Western Embankment between the Prallsville Lock at Station 155+00 and the railroad bridge crossing over the Canal at Station 205+00 is a narrow embankment that separates the Canal from the Delaware River. During extreme flooding events, the embankment is threatened by the elevated floodwaters from the Delaware River. It was overtopped during separate major storm events in 2005 and 2006 when the embankment breached into the Canal. In 2011, Tropical Storms Irene and Lee caused severe flooding of the Delaware River. While the embankment did not breach, more than 1,000 linear feet of the embankment experienced slope failure on the Canal side due to the saturation of the embankment from the river, and significant amounts of soils slid into the Canal. These slides compromised the cross-sectional area of the embankment, temporarily reducing the ability for the embankment to resist breaches.

Emergency actions were taken to prevent a breach of the embankment following the storms in 2011. These emergency actions included placement of fill material onto the embankment with varying levels of compaction. The fill material had to be installed via conveyor belt from the opposite side of the Canal due to the unsafe nature of the embankment. While a breach was prevented, additional long-term repairs are required to reinforce the repaired areas. This earthen embankment is generally comprised of medium dense to very loose, brown silty or clayey sand with varying amounts of gravel, which can be susceptible to slope failure from saturation and/or erosion during major flooding events, which can ultimately lead to breaching. Stability improvements are being considered to increase the factor of safety against slope failure; failure by piping through seepage when the river approaches the top of the embankment; and failure by erosion caused by overtopping of the entire embankment.

A professional engineering services contract was awarded in March 2014 to a team led by TranSystems. Hunter Research was selected as the Cultural Resource consultant for the project. A Schematic Design report was prepared in September 2017. Analysis of repair alternates led the Authority to select a design that included restoration of all Canal side slopes affected by the

2011 tropical storms; regrading of the embankment's crest to eliminate depressions that allow concentrated flow during flooding events; rehabilitation of the Delaware River dry-laid stone armoring at the embankment areas damaged by the 2011 storms; and a compaction grouting program for approximately 740 linear feet of embankment that should improve the soil's density and permeability parameters as well as the embankment's overall stability. Subsequent research concerning the potential risks of compaction grouting for narrow earthen embankments led the Authority engineering team to conclude that compaction grouting should be discarded as an option. Currently, the Authority's engineering team is working with the consultant to develop alternatives to compaction grouting. The Authority decided to break the project into two phases. Phase one will include restoring a uniform embankment crest, removing temporary repairs, stabilizing the Canal-side slope and repairing damaged dry-laid stone armoring. Phase two will consist of any structural embankment improvements that are needed. The work on Phase one is projected to begin in FY23.

### **Rehabilitation of the Swan Creek Aqueduct & Culvert**

The Swan Creek Aqueduct and Culvert are located at approximate Station 363+00 on the Canal in the City of Lambertville, Hunterdon County. The aqueduct structure was erected to carry the Canal over Swan Creek, with the secondary function of a spillway for the Canal. An adjacent culvert also contributes to the conveyance of Swan Creek under the Canal, the multi-use trail, and the former Belvidere-Delaware Railroad. The Swan Creek Aqueduct is a concrete and masonry structure that was partially rehabilitated in 1989 when waste gates were replaced, some of the masonry was reconstructed, and some of the existing concrete was repaired with shotcrete.

Repairs were made to the aqueduct in 2006 following major flooding events on the Delaware River. Significant leakage occurred through the masonry wall on the southeast part of the structure where Swan Creek enters the opening under the aqueduct. A contractor was hired on an emergency basis to pump pressure grout behind the wall where a sinkhole had formed as a result of the seepage. The seepage was slowed significantly by the injection of the grout, although it did not stop completely.

A jet grout seepage cutoff wall was constructed in April 2009 to eliminate seepage through the wingwall. Most of the seepage was stopped with the jet grout seepage cutoff wall. An additional phase of repairs was conducted in 2014, which included rehabilitation of masonry and concrete and replacement of the bent stem for one of the two waste gates.

The scope of work for the 2014 repair project was reduced during construction due to dewatering issues and safety concerns of the contractor. The corrugated metal liner in the north culvert showed signs of being corroded, limiting the amount of work which could be conducted in the culvert.

A Scope of Services will be developed to retain a consulting engineer to design a new structural liner to guard against further deterioration and concrete spalling. The design engineer will have to address all of the concerns noted during the 2014 construction, as well as consider design options for the culvert rehabilitation and reinforcement that will not significantly reduce the flow rate capacities of the culverts.

## **Round Valley Reservoir Dams-Rehabilitation & Resource Preservation Project – Earthen Dam Rehabilitation and Ancillary Work**

Preliminary Engineering and Owner’s Engineer

Design Improvements to Round Valley Dams - Engineer of Record – Design Engineering Only

Earthen Dam Rehabilitation and Ancillary Work (Improvements to Round Valley Dams) – Construction (Bond)

Construction Engineering Management for Design Improvements to Round Valley Dams (Bond)

Dam Abutment Grouting (Round Valley North and South Dams) (Bond)

Sediment Relocation (Dredging) for Maintenance of the South Tower Intake Channel (Dredging) (Bond)

Round Valley Reservoir Electrical Services Upgrades

Round Valley Security Improvements (Cameras)

Background Screening of Contractors and Consultants

In connection with the 2013 Formal Dam Inspection, the Authority convened a Technical Review Board (TRB) in April-May 2014 comprised of experts in the fields of dam construction on limestone formations, evaluation of critical dam construction features, and geology related to dam construction. This was the first TRB that was assembled to review information about the construction and operation of the Round Valley (RV) Reservoir and the first one in 20 years to look at operations data at Spruce Run (SR) Reservoir. The SR and RV Dams were constructed in the 1960s. The TRB recommended additional information gathering of the construction plans and records for the RV dams, and the installation of piezometers at the three embankments at RV Reservoir. The TRB also recommended installation of additional piezometers at SR Dam. The TRB recommended that the side scan sonar, previously conducted in the mid-1980s at the SR Reservoir, be repeated and that the drainage pipes at the toe of the SR Dam be visually inspected by remotely operated cameras. The TRB also recommended that a follow-up to the first TRB be performed for RV and SR.

The 2013 contract with Gannett Fleming, the engineering consultant for the Formal Dam Inspection, was amended to oversee the performance of the above noted work, including but not limited to, subcontracting the specialty drillers for the installation of the piezometers at all four dams, subcontracting for the performance of the side scan sonar, and overseeing the follow-up TRB meetings for RV and SR.

In preparation for the follow-up RV TRB, Authority staff was tasked with compiling and digitizing all available records of the RV embankments. A searchable database was constructed to assist Authority staff, the TRB, the Owner’s Engineer, and the Engineer of Record eventually chosen for the rehabilitation work at RV in their analysis of all available data pertaining to the construction and maintenance of the embankments. The first RV TRB took place in July 2015 and was specifically slated to conduct a Potential Failure Mode Analysis (PFMA) on the three RV Embankments (RV South, RV North, and RV Dike). In its report on the PFMA, the TRB

recommended that the Authority “begin budgeting, engineering, and planning for the required modifications” to RV.

At that time, it was anticipated that construction would be large in scale and include the following, at a minimum:

- Foundation rock grouting, particularly at the embankments/abutments to mitigate potential sources of seepage;
- Installation of a new blanket drain system on the downstream slopes of all three embankments at Round Valley to filter the existing seepage;
- Installation of new toe drains to filter, collect, and convey embankment and foundation seepage safely away from the structures; and
- Installation of additional fill to flatten the downstream slopes to increase the stability factor of safety.

Schnabel Engineering was procured to act as the Engineer of Record to investigate, plan, design, and provide full time construction management services for the above noted efforts. Gannett Fleming was procured to provide further engineering and consulting services during design and construction in the role of Owner’s Engineer. While Schnabel Engineering will act as the Engineer of Record, Gannett Fleming will continue to provide advice and consultation to Authority staff during this very important project.

Schnabel Engineering completed the design plans, specifications, and permitting for the project. The following represents a summary of the tasks that comprise part of the design:

- Dredging of the Round Valley South Tower Intake Channel (detailed below);
- Security improvements at RV Reservoir (detailed below);
- Consider alternatives to rehabilitate the hydraulic valve on the Round Valley South Dam (detailed below);
- Remove and replace ten-inch cast iron pipe that connects the RV Force Main to the RV South Vault (detailed below);
- Repairs to the Round Valley building structures (towers and vaults, detailed below);
- Installation of a new blanket drain system on the downstream slopes of all three embankments at Round Valley to filter the existing seepage;
- Installation of new toe drains to filter, collect, and convey embankment and foundation seepage safely away from the structures;
- Electrical service improvements to the three embankments at RV Reservoir (detailed below);
- Grouting of the abutments at the North and South Dams.

It is noted that, with the exception of the security improvements, which will be financed from the CIP, long-term bond funding has been obtained from the New Jersey Infrastructure Bank (NJIB). The project is intended to be phased with the abutment grouting, intake channel dredging, and electrical improvements to be implemented prior to the large-scale work on the embankments,

which will incorporate all of the remaining noted scope items. The security improvements are scheduled to be constructed after the large-scale embankment work.

#### **Round Valley North and South Dam Abutment Grouting (Construction Completed in FY20)**

Following an initial recommendation from the TRB, the Engineer of Record reviewed all of the grouting records associated with the original construction. The Engineer of Record has recommended grouting of the abutments at the North and South Dam. The abutments are the edges of the dam where the constructed embankment meets the existing valley slope. Review of the original grouting records suggested that the grouting was terminated before it reached the end of the abutments. The grouting in this project was accomplished by drilling through the overburden soils and into the bedrock below. Cementitious grout was then pumped under pressure into the bedrock to fill existing cracks or voids that may be present. This project was completed in FY20.

This project was bid out separately from the other RV projects so that it could be completed ahead of the large-scale embankment modifications. Since this project was financed through NJIB bonding, funding is not included in the CIP budget.

#### **Dredging Intake Channel to Round Valley South Dam Tower (Construction completed in FY20)**

When the Round Valley Reservoir was originally constructed, a channel was blasted and excavated from the rock leading into the reservoir side of the Round Valley South Dam Tower. Over more than 50 years of pumping from the river, the constructed channel has filled with sediment. As part of the large-scale Round Valley Rehabilitation & Resource Preservation Project, the consultants were asked to prepare design plans to remove the significant volume of sediment from the channel.

The investigation and design for this project is included in the scope for the Engineer of Record on the Round Valley Reservoir Dams-Rehabilitation & Resource Preservation Project. The chosen design called for relocation of the sediment to the deepest parts of the reservoir. The project was bid, awarded, constructed, and completed in the winter of 2019/2020 (FY20).

This project was bid out separately from the other RV projects so that it could be completed ahead of the large-scale embankment modifications. Since this project was financed through NJIB bonding, funding is not included in the CIP budget.

#### **Round Valley Reservoir Electrical Service Upgrades (Construction completed in FY21)**

The Earthen Dam Rehabilitation and Ancillary Work (detailed below) project required the installation of a dewatering pump system at the toe of each embankment. Such a system requires the use of significant electricity. In advance of the large-scale project, the Authority made upgrades to the existing electrical service at the North Dam and South Dam and installed electrical service at the Dike. These services were sized appropriately for the dewatering system

at each embankment and future improvements to the structures, including security upgrades and electric actuators. This project also included upgraded electric panels at each vault, generator transfer switches at each vault, and internet service installation at the Dike (for security improvements). This work was financed through NJIB bonding, so funding is not included in the CIP budget, and was completed in fall 2020 (FY21).

### **Earthen Dam Rehabilitation and Ancillary Work (One Construction Contract):**

#### Embankment Modifications

The goal of the embankment modifications, as stated above, is to install a new blanket drain system on the downstream slopes of all three embankments at Round Valley to filter the existing seepage. Further, the existing seepage will be collected in new toe drains, monitored, and conveyed safely away from the structures.

Final design plans and technical specifications and permitting are complete. The scope of the design was discussed and vetted at a meeting that included the Engineer of Record, members of Authority staff, representatives of the NJDEP Bureau of Dam Safety, the Authority's Technical Review Board (TRB), and the Owner's Engineer. The design included excavation into each dam while maintaining a specific slope acceptable to the Engineer of Record and the TRB. The soils removed from the embankments are being stockpiled at or near each dam site. Once the excavations have reached a certain depth, sand and gravel filtering drains are being installed across the entire exposed downstream slope. In order to maintain a crest width sufficient for construction operations, the crests of the North and South dams were/will be temporarily lowered. The maximum allowable reservoir pool elevation during the project will be elevation 360 feet, or 25 feet below normal pool.

At each embankment, the major excavation work is being preceded by the installation of dewatering wells and piezometers. The dewatering wells act to lower the phreatic line (groundwater levels) in the embankments. The new piezometers determine the effectiveness of the dewatering wells, which were proved prior to excavation into the embankments.

This project (Earthen Dam Rehabilitation & Ancillary Work) was bid in the fall of 2019 and awarded to a contractor with a notice to proceed in January of 2020. Construction was initiated shortly thereafter. The embankment work is phased with the Dike being constructed first, followed by the North Dam, and then the South Dam. The project is scheduled to continue through the first quarter of FY24. This work will be paid for through a separate application for bonding. Since it will be bonded, funding is not included in the CIP budget

#### Round Valley Ancillary Work

##### Rehabilitate Hydraulic Valve on RV South Dam Low-Level Release

The existing RV low-level release valve was last rehabilitated in 1992 when a hydraulic valve actuator and hydraulic control system were installed at the Round Valley South Tower. This hydraulic system, with hoses reaching down to 180 feet below the water surface to the low-level

release valve, replaced the out-of-service, original control system. The hydraulic valve installed in 1992 is no longer functional and required rehabilitation.

The investigation and design for this project is included in the scope for the Engineer of Record on the Round Valley Reservoir Dams-Rehabilitation & Resource Preservation Project. After inspection of the system and a report of proposed alternatives, the alternative selected was the complete abandonment of the low-level release pipeline. Abandonment was accomplished by filling the pipeline with grout. The hydraulic lines to the underwater actuator were also removed. This work is included in the contract for the Earthen Dam Rehabilitation and Ancillary Work contract and paid for through the above noted bonding. Since it is being bonded, funding is not included in the CIP budget. This portion of the ancillary work was completed in FY22.

#### Rehabilitation of Ten-inch Cast Iron Pipe Connecting RV-S Dam Vault to Force Main

The existing ten-inch cast iron pipe connecting the 108-inch RV Force Main to the RV South Dam Vault was installed as part of the original construction of the Force Main. Through the use of dye testing, Authority staff confirmed that an underground leak exists somewhere in this ten-inch cast iron pipe, likely adjacent to the vault. This pipe was installed underground with flanged connections which are prone to leak in buried applications. The alternative selected for the repair is to replace the pipe by direct burial.

The investigation and design for this project is included in the scope for the Engineer of Record on the Round Valley Reservoir Dams-Rehabilitation & Resource Preservation Project. This work is included in the contract for the Earthen Dam Rehabilitation and Ancillary Work contract and paid for through the above noted bonding. Since it is being bonded, funding is not included in the CIP budget.

#### Repairs to Round Valley Reservoir Building Structures (Towers and Vaults)

The building structures (towers and vaults) at the Round Valley Reservoir are in need of maintenance. Authority staff believed it was prudent to take advantage of the potential lowered reservoir condition to make repairs to the reservoir building structures, including the underwater portions of the towers.

The Engineer of Record has already made inspections, including underwater portions, of the two towers in the Round Valley Reservoir. The work on the towers will include, but not necessarily be limited to, repairs to the sluice gates, roof replacements, access ladder replacements, and replacement of the existing cranes. This project also includes the purchase of an emergency portable generator to be used with the transfer switches being installed at each vault as part of the Round Valley Reservoir Electrical Upgrades project.

This work is included in the contract for the Earthen Dam Rehabilitation and Ancillary Work contract and paid for through the above noted bonding. Since it is being bonded, funding is not included in the CIP budget.

### **Security Improvements at RV Reservoir - Cameras**

Staff has identified potential improvements to existing cameras and has recommended the addition of new cameras as the most prudent means of enhancement. The investigation and design for this project is included in the scope for the Engineer of Record on the Round Valley Reservoir Dams-Rehabilitation & Resource Preservation Project. This work is expected to begin in FY24 after the conclusion of the large-scale embankment modifications. It is anticipated that this work will be paid for from the CIP budget.

### **Security Improvements RV and SR Perimeter Hardening**

Additional security improvements are considered for the RV and SR embankments on a continual basis. Furtherance of the existing perimeter hardening is being considered as part of the next improvements to the existing security. It is anticipated that this work will be paid for from the CIP budget. The work will be completed as part of multiple projects over the next several years, with the earliest improvements expected to take place in FY23.

### **Background Screening of Contractors and Consultants**

The Authority retained a consultant to process personal identity verification and criminal background history checks of individuals who will be accessing restricted areas of Authority property during the rehabilitation projects at the Round Valley Reservoir.

The chosen security consultant is providing the necessary equipment, such as hand-held scanners and other associated communications hardware for all access gates at the Round Valley project. This contract started in FY20 and is expected to run while the Earthen Dam Rehabilitation and Ancillary Work contract is ongoing (expected to finish in FY24).

### **Spruce Run Dam Foundation Grouting Program**

Construction of the Spruce Run Dam in the early 1960s faced a significant engineering challenge: the bedrock intended as the dam's foundation was comprised of the Kittatinny Limestone formation. Limestone is a soluble carbonate rock which gradually dissolves in the presence of even the weakest acids. Over years of chemical weathering by groundwater, limestone formations characteristically develop extensive networks of solution channels, caverns, and voids.

The dam designers needed to find a way to fill the fractures and cavities to create a suitable foundation for the earthen embankment. After various studies and explorations, the designers developed a grouting program which added strength and minimized seepage through the dam's foundation. The program consisted of installing a 100-foot-deep grout curtain along the dam's alignment as well as conducting shallow blanket grouting over the worst cavernous zones.

For the last 60+ years, the Spruce Run Dam's original grout curtain has largely performed as intended. However, one of the challenges with grouting in limestone formations is that the rock's voids and fissures are often filled with native soil material, which is not usually displaced

by the pressure-injected grout. As time passes, this soil infill can be flushed out by groundwater, leaving voids behind.

Authority staff has monitored this condition since the 1980's using instrumentation located in the dam embankment and foundation. In the 1990's the Authority convened a Technical Review Board (TRB) to analyze foundation conditions and make recommendations. In 2014, on the basis of observed trends in the instrumentation, the Authority retained the services of a TRB consisting of three highly qualified experts in treating dam foundation seepage. Since 2014, the TRB has met on numerous occasions and most recently in June 2022. The TRB also reviews instrumentation data several times a year. In September 2021, the TRB concluded that the instrumentation suggests that the existing grout curtain continues to slowly deteriorate and that the condition has progressed to a point that it would be prudent to initiate plans for a remedial grouting program.

Following the TRB recommendation, the Authority issued a Request for Proposals (RFP) in spring 2022 for professional engineering services for the project. The selected engineering consultant will be responsible for design, permitting, and construction management. Technical proposals for the project have been received and evaluated by Authority staff, and it is expected that a design contract will be awarded in FY23 with construction to start in FY24. It is anticipated that both the design and construction of this project will be financed through NJIB bonding. As such, funding is not included in the CIP budget.

### **Spruce Run Spillway Improvements**

As part of the Spruce Run Reservoir multidisciplinary engineering project, the consultant was tasked with evaluating the spillway design flood (SDF) and the existing spillway capacity.

The SDF represents the runoff resulting from the Probable Maximum Precipitation (PMP). The PMP is the regulatory design basis for large dams in New Jersey. Preliminary analysis utilizing the current PMP indicates the spillway is undersized for this extreme weather event (approximately 34 inches of rain in 24 hours). The NJDEP is currently re-evaluating the PMP using state-of-the-art analyses. Based on similar re-evaluations performed by neighboring states, it is expected that the PMP values may change modestly, but it is likely that the resulting SDF will still exceed the existing capacity of the spillway. As such, the spillway will require modification to increase its capacity to pass the SDF. The consultant is expected to use the updated PMP being generated by NJDEP to finalize the analysis of the Spruce Run spillway capacity in FY23. The Authority expects to then procure professional services for investigation, design, and construction management of any necessary spillway modifications in FY24. Construction of improvements will follow in FY25 or FY26. It is anticipated that construction of the improvements will be funded via NJIB bonding. As such, funding is not included in the CIP budget.

## **New 2-dimensional (2-D) Inundation Mapping for Round Valley and Spruce Run Reservoir**

In 2014 and 2015, the Authority upgraded all of the inundation mapping (attachments to the Emergency Action Plan) for all four of the high hazard dams at the Spruce Run and Round Valley Reservoir Complex in Clinton. This mapping upgrade was done by taking the old inundation model's one dimensional (1-D) data that was originally drawn onto high scale USGS mapping and transferring it into a GIS overlay of modern aerial images. This work produced maps that were significantly more detailed than the previous mapping and showed the location of residential and commercial structures that may be affected by flooding during a dam emergency.

The drawback regarding these upgraded maps is that the inundation areas are still dependent upon the 1-D computational data from 1980. The 1-D mapping is based on empirical calculations using cross-sections taken at large intervals along the rivers. Authority staff believes that it is prudent to invest in a new study where computers model the flows based on 2-D topographic squares in the flood zones. The degree of accuracy of this method far surpasses the existing 1980 1-D studies. Modern deliverables may also include animations as well as color coded mapping layers depicting depth of water in any particular area in a time-sequenced video. It is also possible to better simulate the effect of tidal fluctuations on the inundation area, which was not possible to analyze at the time of the initial models. This work will begin after the ongoing dam rehabilitation work at Round Valley is complete so that the modeling correctly represents the final configuration of the dams.

## **Rehabilitation of the Six-Mile Run Culvert**

The Six-Mile Run Culvert is a three-barrel historic stone arched culvert that carries the Six-Mile Run under Canal Road, the Canal, and the multi-use trail. The culvert was rehabilitated in the mid-1980s. Stone-faced concrete headwalls were constructed at the inlet and outlet ends of the barrels and minor stone repair was performed inside the culvert barrels. A portion of the stone facing on the downstream headwall dislodged from the concrete substructure during the winter of 2005-2006.

It is noted that the Township of Franklin maintains the road above the culvert. The culvert is considered a bridge by the NJDOT, and thus, biannual inspections are performed by an engineering consultant. Inspection reports are forwarded to the County of Somerset, Township of Franklin, and the Authority.

In March 2018, a sinkhole formed in the roadway above the structure, requiring emergency repairs. The emergency repairs were performed by a consultant and contractor procured by the Authority. This sinkhole suggested that the movement of soils above the stone arches that form the culvert is occurring. The emergency repairs were considered to be temporary. Inspections of the upstream interior of the culvert, located directly beneath Canal Road, have confirmed missing stones and movement of soil.

Additional temporary repairs were performed in the spring of 2019 to limit the loss of stonework in the interior of the culvert by filling with a lightweight concrete. At this time, another sinkhole

formed that required filling with lightweight concrete.

An additional sinkhole formed in the same area of the culvert in the summer of 2021, requiring immediate repairs. This sinkhole was filled with concrete as a temporary measure until the large-scale rehabilitation can take place.

Engineering services have been procured to design the culvert rehabilitation, and the project is currently in the design and permitting phase. The project will address any structural deficiencies found in the structure to provide for a long term rehabilitation. The temporary repairs will be removed and replaced with appropriate historical aesthetics of the stonework. Further, the collapsed stone façade on the downstream headwall will be replaced. The consultant was tasked with designing plans to clean and inspect the culvert, which were bid in FY20. The bids were ultimately determined to not be feasible, and other options for inspecting the culvert, including dye testing, were initiated. Engineering design is near completion, and construction is expected to begin in FY23.

### **Replacement of Fuel Dispenser and Software/Inventory System at Spruce Run Administration Building**

The Spruce Run facilities house the Administration Building, the mechanical shops, and a fleet of maintenance and commuting vehicles. The Administration Building was constructed in the early 1960s and includes a gasoline facility that was found leaking, prompting its relocation and reconstruction in 1991. The 1991 project included two double-wall, fiberglass-coated, steel underground storage tanks with a 5,000 gallon capacity for gasoline and a 2,000 gallon capacity for diesel fuel; a fuel dispensing island with computerized pumps; a canopy for weather protection; associated piping and electrical wiring; leak detection; overfill protection; spill prevention; and corrosion protection for both tanks and piping.

The system has generally performed to the Authority's needs, but inspections revealed that the dispenser frames, supplementary connection piping, containment chambers, junction boxes and the fuel island steel curb forms are corroded and have lost most of their structural integrity. The dispensing units are also in poor condition and are discontinued from the current market. The fuel storage and management system requires an upgrade to match newly installed fuel dispensing systems at the Canal Field Office in West Trenton and the Manasquan Water Supply System in Wall Township. It is noted that the most recent tank tightness test results demonstrated that the tanks are in sound condition.

The Authority retained the professional engineering services of a consultant to investigate, design, and provide part-time construction management for the rehabilitation project. The Authority retained the services of a contractor in 2019. The contractor performed a portion of the work before the tanks' sump pits failed regulatory inspection due to materials and equipment deterioration. The Authority requested design upgrades from the project's Engineer. After the new plans and associated permits were released by the State regulatory agency, the contractor gradually resumed construction activities in 2021. It is expected that the project will be completed in FY 23.

### **Replace Office Telephone System Authority-Wide**

The Authority telephone system was purchased in 2007 with a serviceable life expectancy of ten years, based on history and the manufacturer's and installer's recommendations. In 2013, the Spruce Run Administration Building phone system was replaced due to a lightning strike. At that time, the service company stated that if the Authority replaced in-kind, it would be installing old technology and repair and replacement parts would be limited. All of the Authority systems are currently operating in analog mode and current technology is digital. By proactively upgrading the technology, the Authority will gain additional capabilities including voicemail to email; extension dialing between Authority locations; teleconferencing and videoconferencing within the system and dedicated teleconference and videoconference units for each location that will be standardized; and digital recording capability on phones and conference phones.

Facilities personnel will also be able to access and service all systems from one location. Upgrading the systems would necessitate the replacement of all components, including handsets, door phones, and conference phones. Additional and replacement wiring and switching will also be required. Phone system replacement is anticipated for FY23. Investigation is ongoing to ensure there is a redundant communications system in the event of an emergency.

### **Refurbishment of Main Pumps and Motors No. 4, 5, 7, & 8 with Additional Upgrades at the South Branch Pumping Station**

The Authority's South Branch Pumping Station (SBPS) is located in Clinton Township. The primary purpose of the SBPS is to pump up to 350 million gallons per day (MGD) of raw water from the South Branch of the Raritan River to the Round Valley Reservoir as needed to replace depleted storage. The water transfer is accomplished using ten horizontal, centrifugal pumps with 2,000 horsepower motors. Maintenance of the pumps is essential to operations at the SBPS.

The SBPS was built in 1965. In 2009, the Authority procured an engineering consultant to provide professional engineering services to prepare an Asset Management Plan (AMP) for the SBPS, which was completed in 2011. The AMP included inspection, testing, and conditions assessment for major mechanical and electrical systems and identified a need for renewal and replacement of some mechanical and electrical components. Following recommendations of the AMP, the Authority proceeded to retrofit several of the major mechanical and electrical equipment systems. The Authority recently refurbished two of the ten pumps, numbers 1 and 6, as part of a trial and a phased approach to rehabilitate all of the ten pumps, motors, suction piping, and baseplate assemblies. The two refurbished pumps were placed back into service in 2016.

This project represents the second phase of the rehabilitation. An engineering consultant is currently investigating and designing the rehabilitation of four additional pumps, motors, and mountings in the north and south bays of the SBPS, listed as pump Nos. 4, 5, 7, and 8. The project will include fabrication and installation of new baseplates to address alignment issues. It is expected that the consultant will perform an investigation to identify appropriate rehabilitation

items, secure needed permits and approvals, and prepare the construction plans and specifications that are necessary to bid the project.

Other miscellaneous pump station system upgrades, including electrical and control upgrades, are anticipated to be addressed in this project as well. These include alarm sensors and systems replacement, computerized monitoring of pump performance, control room improvements, safety upgrades, HVAC upgrades, pump cooling systems, traveling water screen replacements, asset management plan update, force main hydraulic model study, and VFD drive unit study. The replacement of the Force Main surge tank roof and Whitehouse Release structure roof are being incorporated into this project as well. This project will be comprised of multiple construction projects over the next several years, with the pump rehabilitations occurring first.

### **Replace Boilers at Spruce Run Administration Building**

The four oil-fired boilers in the basement of the Spruce Run Administration Building are nearing the end of their service life and require replacement. These boilers provide the main source of heat for most of the original portion of the Administration Building, although there are currently multiple independent systems elsewhere in the building that provide additional heating. This project requires HVAC engineering analysis, design, and construction code permitting work. The engineer would be tasked with determining the best HVAC solution to replace the four boilers. Possibilities include modern high efficiency boilers, oil fired boilers, natural gas boilers (requiring external gas line extensions), or installation of a system of boilers which could utilize both options. The project would also include the replacement of the hot water heater.

### **Replace Water Storage Tanks in Spruce Run Administration Building Basement**

The two water storage tanks in the Spruce Run Administration Building basement are nearing the end of their service life and need replacement. The tanks act as a buffer/storage for the well water that is pumped from the Administration building's well. Replacement of several doors to the basement is pending and is being added to this contract, since the tanks are very large and require the removal of the doors.

### **Emergency Generator at Spruce Run Administration Building**

The Spruce Run Administration Building's emergency power service is dependent on the operation of a generator that is nearing the end of its service life. The existing generator is in the basement and uses fuel supplied by the building's heating oil underground storage tank. The Authority expects this generator will be replaced with an outdoor unit powered by a cleaner fuel such as propane or natural gas. The project may also involve testing/upgrades or replacement of existing electrical panels and transfer switches. An engineer will be procured who will investigate alternative fuel options, design necessary elements, and acquire all required permits.

## **Multidisciplinary engineering project for structures rehabilitation in connection with the Spruce Run reservoir outlet works**

Authority staff has procured a consultant to provide professional engineering services for all of the tasks described below as A through J. The tasks will manifest as more than one construction project.

### A. Rehabilitation of the Spruce Run Flow Measuring Weir

The Spruce Run Flow Measuring Weir is a reinforced concrete structure that crosses the Spruce Run downstream of the Spruce Run Reservoir and upstream from the confluence with the South Branch of the Raritan River. The weir was constructed in the early 1960s with the rest of Spruce Run Dam to provide a pool that functions as a stilling basin for the primary spillway. The adjoining USGS gauging station on the west bank of the weir measures the total flow of water that is discharging from Spruce Run, including releases through the pipelines and/or overflow at the spillway. Authority staff has been making “patchwork” repairs to the weir over the past decade. However, the concrete structure is deteriorated and spalling or cracking surfaces must be routinely repaired. The consulting engineer has inspected and evaluated the weir and will design repairs, potentially including a bypass sluice gate. It is noted that the structure meets the definition of a dam, and the New Jersey Bureau of Dam Safety has classified the structure as a Class III – Low Hazard dam.

Design plans and specifications are planned for FY23, and construction will likely proceed in FY24 or FY25.

### B. Spruce Run Primary Overflow Spillway Rehabilitation

The primary spillway is a 550-foot long, five-foot high, reinforced concrete ogee overflow weir located at the west abutment of the dam with a crest at elevation 273.0, which is the normal full operating pool level of the reservoir. In plan, the spillway is a circular arc oriented generally north-south. The spillway was constructed in the early 1960s with the rest of the dam. The spillway was rehabilitated in 1987 to repair longitudinal surface cracks, surface spalling, and transverse joint deterioration along the downstream face. As deterioration of the concrete surface of the spillway continued, including spalling and horizontal cracking, a second rehabilitation was done in the fall of 2004. The rehabilitation work consisted of removing deteriorated concrete from the spillway weir and abutment wall surfaces and applying gunite to all prepared surfaces. Over time, mild spalling and cracking were observed in the fiber reinforced, gunite overlay. During a recent inspection in March of 2019, more significant concrete/gunite damage was observed at the toe of the ogee. Also, some spalling and cracking has been observed at the bottom of the ogee spillway’s abutment walls. The consulting engineer investigated the concrete structure at the end of 2019 and suggested that a cementitious repair could be done, but it would not necessarily improve the structural integrity of the ogee structure. Therefore, limited temporary repairs could be performed by Authority staff, while a more comprehensive rehabilitation is planned after completion of hydrologic and hydraulic analysis for the dam and spillway, which are currently underway.

C. Clearing of Spruce Run Spillway Discharge Channel

The Spruce Run Spillway was cut into the bedrock as part of the original Spruce Run Dam construction. Woody vegetation and trees have grown within the channel bottom and side slopes because the spillway often has low flows or does not flow for long stretches of time and accessibility is difficult. Clearing will enable better observation of existing springs and seeps located within the channel bedrock that may be related to the performance of the dam. Clearing of the spillway is also important in order to allow adequate flow of water during significant spillway flows. As a result, the consultant prepared plans, specifications, and obtained permits to restore the channel to original condition by clearing trees and woody vegetation within 14 acres of the discharge channel. The work was substantially completed in March of 2022 (FY22). The contractor is expected to return in fall 2022 to conduct an herbicide treatment, which will result in final completion in FY23.

D. Replace Fixed Cone Valves at Spruce Run Vault

The Spruce Run Reservoir Vault is fitted with two 30-inch fixed cone valves that serve as the primary release valves from Spruce Run Reservoir. When compared to other valves, the fixed cone valves allow for increased accuracy in release quantities and also offer significant pressure reduction. When the structure was reconstructed in 1982, the original valves that were installed in the early 1960s were relocated to their current position. Authority staff performs annual maintenance on the valves, but corrosion present on the valves is making this maintenance increasingly difficult over time. The fixed cone valves are critical to the operation of the reservoir and are nearing the end of their service life. The consulting engineer has provided preliminary recommendations as part of a draft schematic design report.

E. Manual Transfer Switch for Emergency Operation

Reservoir release capabilities depend on uninterrupted power supply for the operation of the tower crane to remove stop logs. Thus, Authority staff recommends adding an emergency backup power source to the reservoir's vault/tower electrical supply system for drawdown equipment operation. As part of the Round Valley Reservoir Dam Rehabilitation and Resource Preservation Project, a consultant has been directed to size an emergency tow-behind portable generator and to design transfer switches at the Round Valley North and South Dam vaults that will feed power to the towers' hoisting equipment. It is anticipated that the consultant will design a manual transfer switch to be installed at the Spruce Run vault that is compatible with the tow-behind portable generator for the current Round Valley project. The consulting engineer has provided preliminary recommendations as part of a draft schematic design report.

F. Spruce Run Tower Hoisting Equipment

The existing outlet tower overhead bridge crane is a hand operated geared bridge and trolley type with a motor driven hoist. The bridge is constructed on standard I beams with a hand chain operated drive. The overhead bridge crane is original to the dam construction in the early 1960s. It is still operational and is used to remove and/or reinstall the stop logs during release operations. However, the unit has developed a minor "travel" over the years, which is

sometimes observed during stop-plank hoisting. In addition, it has become difficult to purchase parts for the crane system. The consulting engineer will investigate the existing overhead bridge crane, review the load rating, and recommend a partial or full replacement of an equal or alternate type of crane in compliance with OSHA regulations. The consulting engineer has provided preliminary recommendations as part of a draft schematic design report.

#### G. Spruce Run Tower Sluice Gate Operators

The Spruce Run Tower mechanical system includes two sets of three sluice gates each, which are operated with floor stand operators fabricated by Rodney Hunt Machine Co. The stands are mounted to the floor and are equipped with stem covers with visual indicators that show the position of the gate at all times. The stands are suitable for motor operation and are also equipped with a hand crank for manual operation. Currently, the motor operation is typically performed with the aid of a gasoline powered “donkey” engine. The Authority would like to improve the mechanical operation of the sluice gates with an electrically actuated system. The consultant will evaluate conditions of the current system and consider use of the existing floor stand operators with compatible electric actuators, or recommend a new, electrically actuated system that reduces operational time and improves labor safety standards. The consulting engineer has provided preliminary recommendations as part of a draft schematic design report.

#### H. Spruce Run Other Ancillary Works

The multidisciplinary project also includes the installation of several other appurtenances: a door on the southern façade of the vault, a hardened access gate adjacent to the vault, OSHA compliant exterior access ladders for the tower and vault, remote reading capability of the vault releases, and new roofs for both the tower and vault. A thorough inspection of the release tower superstructure will also be conducted. The consulting engineer has provided preliminary recommendations as part of a draft schematic design report.

#### I. Reservoir Hydrologic and Hydraulic Modeling

The Spruce Run reservoir was constructed at the former confluence of Spruce Run and Mulhockaway Creek. The reservoir is fed by these two major and several other minor streams, with a total drainage area of 41 square miles. The original Spruce Run hydrologic and hydraulic (H&H) calculations were performed by Whitman, Requardt and Associates in March 1960. The engineer used the available historic stream flow records for streams in the reservoir’s watershed and assumed values for others in the absence of data. H&H calculations were performed using empirical formulas to predict passing flows over the reservoir’s primary spillway and ogee weir.

The 2017 PFMA report concluded that an updated hydrologic and hydraulic analysis was recommended using current methods. As a result, the consulting engineer is developing hydrologic and hydraulic models that evaluate the capacity of the existing dam and spillway relative to the runoff produced by the Probable Maximum Precipitation (PMP) in compliance with the spillway design storm requirements of the NJDEP Bureau of Dam Safety.

## J. Rapid Drawdown Planning

The outlet works at Spruce Run reservoir consist of an intake tower and twin pipes leading to a control vault at the downstream toe of the dam. Each of the twin pipes reduce from 84-inch diameter at the intake tower to 60-inch diameter near the control vault and to 48-inch diameter within the vault. The consultant is reviewing the current drawdown operations and computations in order to find ways to expedite the reservoir drawdown process. To this end, the consultant has provided preliminary recommendations as part of a draft schematic design report.

### **Rehabilitation of the Prallsville Culvert Pit and Miscellaneous Components – D&R Canal**

The Prallsville Lock is located on the Delaware and Raritan Canal at Station 155+00. Upstream of the lock, situated at the confluence of the Canal and Wickecheoke Creek, there is a 196-foot-long concrete spillway known as the Prallsville Spillway. Between the spillway and lock, there is a stone masonry culvert that passes under the Canal to the Delaware River. The culvert's inlet is located in a rectangular pit adjacent to the Canal that is about 65 feet long, 20 feet wide, and 18 feet deep. The pit has dry laid stone masonry retaining walls and also contains the outlet of another culvert, which passes under the Canal towpath. Flow is conveyed from one culvert to the other along the pit bottom via open channel flow.

In September 2021, flooding associated with remnants of Hurricane Ida caused a partial collapse of the retaining wall at the southwest side of the pit, which is parallel to the Canal and located only 25 feet from its edge. Four non-operational sluice gates located at the Prallsville Spillway's downstream abutment were also damaged during the flooding.

In spring 2022, the Authority solicited Statements of Qualifications and Technical Proposals for professional engineering services for the rehabilitation of the Prallsville Culvert Pit. It is expected that the project will consist of connecting the two culverts within the pit and filling the pit to grade, which will prevent future failures of the retaining wall, and more importantly, the canal embankment it supports. It is also expected that the damaged sluice gates will be decommissioned as part of this project, as they are no longer needed.

The successful consultant will prepare plans and specifications suitable for bidding as well as provide cultural resource services for the project. It is anticipated that design and permitting will begin in FY23, and that construction will take place in FY24. Because this project was necessitated by damage associated with Hurricane Ida, it is expected that a portion of the project costs will be reimbursed by FEMA. Remaining costs not covered by FEMA will be funded through the CIP.

### **Round Valley Reservoir North & South Tower Sluice Gate Refurbishment**

There are a total of nine sluice gates at the Round Valley Reservoir: three in the South Tower, and six in the North Tower. The sluice gates allow the Authority to release water from the reservoir. At the South Tower, the gates are also opened to allow water to be pumped into the reservoir from the Round Valley Force Main. The sluice gates date back to the original construction of the reservoir and its appurtenant structures in the 1960s.

As part of the larger Round Valley Resource Preservation Project, underwater inspections of the sluice gates were conducted by both an engineering consultant and a contractor. The contractor also cleaned the gates and replaced some components of their assemblies, including hardware associated with the gate wedges, stem guide bushings, and thrust nuts. From the contractor's inspection, it was determined that there are remaining components of the sluice gate assemblies that require replacement. These include stem couplings, gate wedges, and hardware for the stem guide brackets and gate side rails.

Authority staff is currently working to develop design plans and specifications suitable for bidding. The project will include complete replacement of all deficient components for each of the nine sluice gate assemblies at the North and South Towers. Also, it has been recommended that the Authority implement a program to have the gates cleaned and inspected regularly. As such, the project will also require the contractor to thoroughly inspect and clean all components of the sluice gate assemblies. It is anticipated that this work will begin in FY23.

### **Wastegate and Lock Evaluation and Repair – D&R Canal**

The Canal was converted into a water supply source in the 1940s and 1950s. This included conversion of the original locks into flow control structures with sluice gates to regulate the flow. These structures are critical to the operation of the Canal. Numerous wastegates and locks along the D&R Canal need maintenance, rehabilitation, or improvements. Most of these structures were last inspected underwater in 2001. Underwater engineering evaluations are necessary to identify and prioritize the required work. This project will undertake a phased evaluation of the Canal's wastegates and locks based on operational needs and known problems. This project may also include priority repairs.

### **Improvements to Scudders Falls Wastegate Controls**

Scudders Falls is located in Ewing Township at approximate station 821+20 upstream of the Perdicas wastegate in Trenton. This wastegate, along with the Washington Crossing wastegate, allows the Water Supply Operators (WSO) to divert water back to the Delaware River during heavy rains, before it reaches Trenton. The Scudders Falls gates, controls, and gate house were constructed in the mid-1980s. During power outages, the transfer switch should signal the generator to turn on, which will allow the WSO to operate the gates and maintain the level of the Canal. The transfer switch no longer operates, the controls that operate the gates are old and do not work on one of the gates, and the generator needs repair. Staff would like to upgrade the entire electrical/control system at this location.

### **Rehabilitation of the Upper Canal Embankment - Raven Rock to Prallsville**

Since September 2004, four major flood events in the Delaware River have overtopped the Canal embankment between the Raven Rock Lock and Prallsville Lock. The Canal embankment in this stretch separates the Canal from the River. It is very narrow and is inaccessible by vehicle, so it is necessary to maintain the embankment by boat, which is challenging. During the large flood events, the Canal and the Delaware River water levels were elevated above the

embankment and became one body of water. There are several areas in this stretch that experienced heavy deterioration during these events, typically initiated by fallen trees.

The Authority had to implement emergency measures to prevent further erosion of the embankment following Tropical Storms Irene and Lee in 2011. Due to the location and access issues discussed above, all of the work had to be done by hand. Barges were used to supply the materials (riprap and cement bags), and Authority forces placed the materials in the embankment to close the openings. These temporary repairs require replacement with more appropriate materials, both structurally and historically.

An engineering consultant and a cultural resources consultant were retained to design repairs to this section of the embankment. A professional services contract was awarded to a team led by GZA GeoEnvironmental (GZA) as the engineer for the repairs of the embankment. Paulus, Sokolowski, & Sartor (PS&S) was selected as the cultural resource consultant for the project.

Authority staff identified eight primary locations in this reach that required investigation, design and repair. GZA was charged with inspecting the entire embankment from Raven Rock to Prallsville and identifying any other additional locations that should be considered for repair.

A schematic design report identified and prioritized additional areas that warrant repair and these areas have been added to the scope of work. Conceptual approval has been received from the State Historic Preservation Office. The approach to completing these repairs has been further refined and the Authority is working with the consulting engineer to obtain necessary approvals and develop a final design. Final design is expected in FY23.

### **Rehabilitate Flow Control Gate at Back Race at Lambertville**

The back raceway in Lambertville, located approximately at Station 371+00, consists of one manually operated gate and was constructed as a by-pass to the Lambertville Lock. Due to the configuration of the raceway, the Authority uses this gate during the summer months to prevent the water from stagnating and to flush the algae that may accumulate. Further, it can be used to bypass Canal flow in the event it is necessary to work on the lock. The structure's right and left stone masonry wingwalls are undermined and the timber discharge apron is damaged. The structure is in need of rehabilitation to prevent further deterioration.

### **Rehabilitation of Canal Flow Structures**

There are nine flow control structures located along the length of the Canal that were inspected and evaluated by Schnabel Associates in 2001 to assess their condition and determine the required rehabilitation. The structures included Raven Rock Lock, Prallsville Lock, Lambertville Lock, Kingston Lock, Griggstown Lock, Ten Mile Lock, South Bound Brook Lock, Five Mile Lock, and the Waste Gate upcanal from Ten Mile Lock.

Schnabel's evaluation of these structures identified a variety of repairs needed at each site. In addition to the required replacement of some flow control gates, the deficiencies range from minor concrete cracking and spalling to structural undermining of the locks. The Authority

would also like to upgrade each gate to include an electrically powered operator, which will allow for quicker and safer operation of the gates by Authority personnel.

The Authority plans to phase in gate replacement, operational improvements, and structural rehabilitation based on operational priorities and the results of upcoming underwater engineering evaluations. Currently, Authority staff is developing design plans and specifications for the in-kind replacement of eleven sluice gates and operating assemblies with known issues. These gates are located at various locks, including Five-Mile Lock, South Bound Brook Lock, Ten-Mile Lock, and Griggstown Lock. It is anticipated that construction of these improvements will begin in FY23.

### **Rehabilitation of the Landing Lane Spillway and Embankment Improvements Downstream of Island Farm Weir**

The Landing Lane Spillway is located immediately upcanal of the Landing Lane Bridge in New Brunswick. This spillway was rehabilitated in 1991 with the construction of a concrete cutoff wall on the Canal side slope to control leakage. Timber planks were installed on the concrete wall for historic reasons. The spillway was finished with dry-laid stone on the crest and river side slope. The spillway is deteriorating. The stones are being dislodged and the spillway crest needs to be stabilized. The planned rehabilitation consists of completely dismantling the spillway and installing concrete slabs over its existing footprint. The concrete slabs will act as a substructure to the stones that will be reset with mortar.

A narrow embankment separates the Canal from the Raritan River just downstream of the Island Farm Weir on the Raritan. The river side slope had experienced significant erosion and required rehabilitation.

Authority staff procured an engineer and a cultural resource consultant for both projects. It was anticipated that construction of the projects would be procured together, but the designs progressed at different speeds, and they were separated.

The Embankment Improvements Downstream of the Island Farm Weir was bid in summer 2020 and construction finished in the spring of 2021 (FY21). The Landing Lane Spillway Rehabilitation was bid in the spring of 2021, and construction is anticipated to begin in fall 2022 (FY23).

### **Repair of Pipe at Whitehead Road**

In 2011, a sinkhole developed in the towpath 1,600 feet up canal from Whitehead Road in Lawrence Township, Mercer County. This location is 3,600 feet down canal of the outlet of the Trenton Conduit. The sinkhole developed as a result of a failed 42-inch reinforced concrete (RC) stormwater pipe that connects to a 48-inch RC pipe which goes under the Canal and the U.S. Route 1 Freeway and discharges into the Assunpink Creek. It is noted that the 48-inch pipe replaced a stone masonry culvert under the Canal (same alignment) during construction of the U.S. Route 1 Freeway in the early 1950's. The sinkhole caused erosion of the Canal left bank and multi-use trail. Staff filled the sinkhole with six-inch riprap and regraded the area in 2011,

but the sinkhole has been recurrent. As a result, the Authority contacted the NJDOT, which in turn ordered an inspection of the site by their contractor (IEW) in April 2021. No remedial action has been proposed by the NJDOT to this date.

### **Rehabilitation Work at the Washington Crossing Spillway**

The Delaware River Joint Toll Bridge Commission advised the Authority on June 6, 2013, of a small amount of clear seepage coming from its historic stone bridge abutment at the Washington Crossing Bridge. At the time of notification, the Authority had been operating the Canal at raised levels in that vicinity to address a flow problem in the Trenton area. The higher-than-normal levels of the Canal caused the Washington Crossing spillway, which is directly adjacent to the abutment, to operate (overflow).

Authority staff placed sandbags on the spillway crest to force spillway discharge away from the northern portion of the spillway. This temporary measure is working to eliminate the seepage. Experience from earlier trials has shown that the seepage returns if the sandbags are removed or washed off and flow discharges from the northernmost pipes. Seepage may cause damage to the spillway structure, the bridge tender's house, or the bridge abutment as a result of removal of fines by piping or undermining.

Staff is continuing to monitor the situation and to investigate alternatives for controlling the flowing water.

### **Security System and Upgrades –Clinton and Canal**

Several security improvements have been included as part of the large Round Valley Dam Rehabilitation project identified above, such as electrical service improvements and internet communications improvements. Security monitoring system upgrades will follow the infrastructure upgrades. Other protective measures continue to be considered on an ongoing basis.

### **Rooftop Hydronic Heater for Auto Shop - Spruce Run Admin.**

The 1992 rooftop hydronic heater that serves the Auto Shop at the Spruce Run Administration Building is nearing the end of its service life and should be replaced with a similar unit. Repairs are becoming routine and obtaining parts is growing more difficult.

### **Alexauken Creek Aqueduct**

Paralleling the western side of the Alexauken Creek Aqueduct is the former Belvidere-Delaware Railroad concrete bridge, which passes over the creek, immediately adjacent to the 1940s-era concrete aqueduct trunk. The Aqueduct's historic (circa 1834) northeast, center, and southeast stone abutments were rehabilitated in 1989-1990. Recent inspections revealed that all of the abutments have missing mortar on the lower areas, which are continuously exposed to the water level fluctuation. In addition, the northeast abutment shows vegetation covering the structure on the creek side.

Two Canal leaks were observed at the aqueduct in 2007. The first one was located at the southwest contact of the aqueduct trunk and the stone masonry wall. The second one was observed between the joint of the concrete aqueduct northeast flap wall and the stone masonry abutment. The first leak was addressed with a project engineered in-house, publicly bid, and completed in 2009. The second leak was remediated by Canal staff by placement of a clay plug along the affected Canal left bank. There are no leaks to remediate at Alexauken Creek aqueduct at this time, but it is anticipated that further repairs will be required to maintain the structure.

### **Rehabilitation of the Wastegate Downstream of Ten Mile Lock**

The wastegate is located at Canal Station 2599+50, approximately 600 feet downstream of the Ten Mile Lock in Franklin Township, Somerset County. The existing non-operational wastegate consists of a wooden gate structure set between guides that are attached to the recessed portion of a concrete inlet headwall. A 60-inch diameter concrete pipe under the multi-use trail was permanently sealed with concrete in June 2014. Currently, the stone masonry outlet headwalls are in a serious state of disrepair, and some leakage is evident. The waste gate's façade and the downstream stone headwall need to be rehabilitated.

### **Rehabilitation of the Spillway Upcanal of the Griggstown Lock**

The spillway upcanal of the Griggstown Lock between Station 2060+40 and Station 2064+20 of the Canal in Franklin Township, Somerset County, is in poor condition and warrants rehabilitation. The 380-foot long spillway was built as part of the original Canal construction in the 1830s and is part of the Canal's flood control system into the Millstone River. Engineering services are required in order to inspect the structure, prepare a schematic design, prepare a design of the approved rehabilitation alternative and provide construction management services during the rehabilitation of the structure. A cultural resource consultant is also required to perform a cultural resource investigation for the rehabilitation of the spillway and to provide observation during rehabilitation. Funding for this project is not included in this five-year program.

### **Rehabilitation of D&R Canal Culvert at Canal Station 2550+90 (1 mile upstream of 10-Mile Lock)**

The unnamed culvert at Station 2550+90 is located in Franklin Township, Somerset County, approximately one mile east of the Weston Causeway and ¼ mile east of School House Road. Boswell Underwater Engineering inspected the culvert in September 2007. The inspection identified numerous areas exhibiting missing mortar pointing and stone along both the walls and crown of the structure. Missing stones were also identified on both the upstream and downstream headwalls. The contractor classified the culvert as being in fair condition and recommended repairs be made to the culvert barrel as well as both headwalls. Repairs will be scheduled as needed.

### **Replace Boiler at Canal Field Office**

The boiler at the Canal Field Office (CFO) is the original oil-fired boiler from the early 1990s. There have been boiler operational issues every heating season for the past few years. Natural gas lines are now available on Bear Tavern Road, close to the CFO. A gas line will need to be installed from the road into the building. This would also allow abandonment of the existing oil tank (underground storage tank). Converting the heating system to natural gas will have several advantages for the Authority. Modern boilers are more efficient and reduce utility costs.

### **Replace Underground Heating Oil Tank at South Branch Pumping Station**

The existing 10,000-gallon steel underground storage tank (UST) which contains heating oil for the pumping station is approximately 30 years old. EPA/NJDEP regulations require cathodic protection and testing. If replaced with an underground tank, the new tank would likely be a modern double-wall fiberglass reinforced UST. This project would also include the abandonment/removal of the existing steel tank with a contracted licensed LSRP and permitting with the NJDEP. However, the recommendation at this time would be to replace the tank with an above ground storage tank in an alternate location. Above ground tanks are not regulated in the same manner as underground storage tanks because it is much easier to detect leaks and corrosion. This would reduce the environmental liability of the Authority in the long term and reduce insurance costs. Design and permitting for this project are expected to commence in FY23.

### **Replace Underground Heating Oil Tank at Spruce Run Administration Building**

The existing 5,000-gallon steel underground storage tank (UST) which contains heating oil for the Spruce Run Administration Building is approximately 30 years old. This tank services the boilers, hot water heater, and the building's emergency generator. EPA/NJDEP regulations require cathodic protection and testing. If replaced with an underground tank, the new tank would likely be a modern, double-wall fiberglass reinforced UST. This project would also include the abandonment/removal of the existing steel tank with a contracted licensed LSRP and permitting with the NJDEP. However, the recommendation at this time would be to replace the tank with an above ground storage tank in an alternate location. Above ground tanks are not regulated in the same manner as underground storage tanks because it is much easier to detect corrosion. This would reduce the environmental liability of the Authority in the long term and reduce insurance costs. Design and permitting for this project are expected to commence in FY23.

### **Replace Gasoline and Diesel Underground Storage Tanks at Spruce Run Administration Building Fuel Island**

The Spruce Run fuel dispensing facility utilizes two existing underground storage tanks (USTs) for gasoline and diesel product. The 5,000-gallon and 2,000-gallon double wall steel fiberglass externally coated USTs contain gasoline and diesel fuel, respectively. The tanks supply fuel for the maintenance equipment and vehicle fleet being used by the Spruce Run Administration Building staff, South Branch Pump Station staff, and Watershed Protection staff. These tanks

are approximately 30 years old and were considered for replacement with modern double-wall fiberglass reinforced USTs or possibly with above ground storage tanks in an alternate location adjacent to the fueling island. However, during the construction of the SR fuel dispensers' replacement project, which is currently underway, it was necessary to pump out remnant fuel within the gas and diesel fuel tanks. The operation included a confined space entry in order to swipe and inspect the interior of the tanks. The inspection revealed the tanks to be in sound condition. Thus, replacement of the tanks is not required at this time but the tanks will continue to be monitored. Design and permitting for this project are expected to commence in FY23.

### **Spruce Run Administration Building Network Data Closet Construction**

The Spruce Run Administration Building is in need of a modern environmentally HVAC-controlled data closet in the basement to isolate the network servers and network switches from high temperatures, dust, and humidity. As the demand for network storage capacity continues to increase exponentially and as more engineering projects are completely reliant upon the transfer of plans, specifications and construction photographs digitally, the need for a dedicated space in the building to accommodate the networking hardware and servers has increased as well. This project will require installation of dedicated HVAC Cooling, installation of HVAC venting, relocation of electrical services, and relocation of network cabling and conduits.

### **Rehabilitation of the Trap Rock Quarry Spillway**

The Trap Rock Quarry Spillway between Station 1925+90 and Station 1929+20 of the Canal in Franklin Township, Somerset County, approximately  $\frac{3}{4}$  mile upcanal from Route 518, is in poor condition and warrants rehabilitation. The 330-foot-long spillway was built as part of the original Canal construction in the 1830s and is part of the Canal's flood control system into the Millstone River. Engineering services are required in order to inspect the structure, prepare a schematic design, prepare a design of the approved rehabilitation alternative and provide construction management services during the rehabilitation of the structure. A cultural resource consultant is also required to perform an investigation for the rehabilitation of the spillway and to provide observation during rehabilitation. Funding for this project is not included in this five-year program.

### **Dredging of the Canal between Landing Lane and Route 18**

Approximately 70 percent of water diverted from the Canal is taken by purveyors at the Canal terminus near Route 18 in the City of New Brunswick, Middlesex County. Sediment bars have formed just upstream of the two primary intakes from the Canal wherein the normal Canal operating level is only 18 inches above the sediment level. A decrease in the Canal operating level by more than 12 inches makes it difficult for the water purveyors to divert water. Removal of this accumulation is essential to ensure delivery to these water purveyors.

Removal of the accumulation must be carefully coordinated with the water purveyors in this reach. Development of a program will likely be modeled after the dredging program that was conducted for the Canal reach between Kingston and Amwell Road. Funding for this project is not included in this five-year program.

### **Dredging between Lambertville Lock and Trenton**

Sediment was removed from this reach in the mid-1980s. Breach of the embankment at the Workhouse Spillway in 2011 drained the Canal between the Lambertville Lock and the Kingston Lock, exposing sediment that has accumulated since the 1980s. While the Canal was drained, Authority staff removed the most pronounced sediment mounds but was unable to remove all of the mounds. Long-term planning will focus on the removal of sediment from this reach. Funding for this project is not included in this five-year program.

### **Dredging between Amwell Road and Ten Mile Lock**

Dredging was recently completed in a 10.5-mile stretch of the Canal between Kingston and Amwell Road. Flow in the stretch of the Canal between Amwell Road and Ten Mile Lock is also being impeded by the accumulation of sediment. Long term planning will focus on the removal of sediment from this reach. Funding for this project is not included in this five-year program.

### **Storage Building at Canal Field Office**

The Authority is considering the construction of a pole barn, or similar type storage building at the CFO facility. The additional space for storage of equipment will allow staff to keep certain equipment out of the elements which can extend the life expectancy of this equipment.

### **Spruce Run Administration Building Tie-In to Public Water Supply**

The Authority is conducting a preliminary study/investigation into the possibility of connecting to the regional municipal public water supply system. There are allocation and supply issues being experienced by the local water company which may delay this process, as well as the potential for water system connection fees. This would allow the Authority to abandon the local administration building supply well and the well to the Annex and the Watershed offices. Funding for this project is not included in this five-year program.

### **Storage Building near Spruce Run Annex**

The Authority is considering the construction of a pole barn type structure in the Spruce Run Storage Yard. The need for additional space for storage of equipment and materials has been raised. One benefit of this building would be to provide additional space to keep certain equipment stored out of the elements which would potentially extend the service life of equipment. Funding for this project is not included in this five-year program.

### **Construction of a Bedload Stone Trap at the Wickecheoke Creek**

Wickecheoke Creek enters the Canal just upstream of the Prallsville Lock Control Structure on the border of Delaware Township and Stockton Borough in Hunterdon County. Excess flow from the Canal and the Creek are discharged over the Wickecheoke Creek spillway into the

Delaware River. Investigations in the early 1990s resulted in a recommendation to construct a bedload stone trap in the creek, upstream of its confluence with the Canal, to improve the ability to remove the bedload without disrupting the flow in the Canal.

The Authority recommends construction of the structure because of the escalating need to remove bedload from the Canal at this location and the difficulty in performing such removal. This project is currently on hold and has been moved to low priority. Funding for this project is not included in this five-year program.

### **Cutoff Wall in the Shipetaukin Creek Guard Bank**

The Shipetaukin Creek Guard Bank located in Lawrence Township, Mercer County, was constructed along the western side of the Canal to separate the Canal from the Lawrence Meadows and Shipetaukin Creek. The Guard Bank breached during Hurricane Floyd in September 1999 because of high water levels in Lawrence Meadows. Typically, the water level in the Lawrence Meadows between Province Line Road and the Route 295 Interchange is higher than the water levels in the Delaware and Raritan Canal, so the breach did not cause a loss of Canal water supply.

Leakage is visible through the guard bank from Lawrence Meadows towards the Canal. Currently, the seepage is clear; however, the volume of seepage is getting progressively worse and a program is necessary to control the leakage and prevent piping and a potential failure of the embankment. This section of towpath (multi-use trail) is approximately 7,000 feet long, with most of the leakage occurring in a 3,200-foot long section between Station 1477+00 and Station 1509+00.

The construction of a cutoff wall is planned in this reach of the embankment. The depth of the cutoff wall is expected to range between eight and 18.5 feet and it will be constructed of either slurry concrete mix or a clay mix. The slurry concrete mix has the advantage of ease of installation, but may cause permit problems.

It will be necessary to retain a consultant to obtain boring information through the guard bank to determine the precise recommended depth of the cutoff wall. Funding for this project is not included in this five-year program.

### **Wickecheoke Creek Gates Abandonment**

Authority staff has been instructed not to operate these wastegates because they have been extensively damaged by wood debris that accumulates in this area during flooding. In September 2021, flooding associated with remnants of Hurricane Ida destroyed a concrete pier, caused the operator's platform to partially collapse, and damaged a gate operator. These gates are no longer needed for operations and will be decommissioned as part of the Prallsville Culvert Pit rehabilitation project.

### **Rehabilitation of the Gold Run Spillway**

The Gold Run Spillway is located at Station 955+00, approximately 500 feet upstream of Lower Ferry Road in Ewing Township, Mercer County. The Gold Run Spillway is a concrete structure built in 1913. The concrete spillway box is approximately 98 feet long and four feet wide. The elevation of the spillway crest is 56.70 feet.

Fourteen 36-inch diameter concrete pipes handle the flow of water coming through the spillway. The pipes discharge onto a downstream concrete apron that protects the embankment from erosion. The spillway box is leaking and needs to be replaced. Funding for this project is not included in this five-year program.

### **Carnegie Lake Culverts Investigation / Isolation**

There are two submerged culverts located adjacent to Carnegie Lake which the Authority must locate and investigate. Funding for this project is not included in this five-year program.

### **Raven Rock Retaining Wall Downcanal of Lock**

The control structure at Raven Rock Lock is located at Canal station 0+00 at Bull's Island State Park in Delaware Township, Hunterdon County. The concrete lock structure consists of four metal sluice gates and operators. Adjacent to and downcanal from the lock there is a stone retaining wall. Several stones are missing from the wall. Funding for this project is not included in this five-year program.

### **Refurbishment of Main Pumps and Motors No. 3 & 9** **Refurbishment of Main Pumps and Motors No. 2 & 10**

See description above for Refurbishment of Main Pumps and Motors No. 4, 5, 7 & 8. The remaining four pumps would be refurbished in the order stated above. Funding for these projects is not included in this five-year program.

### **Canal Culvert Rehabilitation 2249+79 (Suydam)**

The culvert near Suydam Road is a single barrel drop style culvert located at Station 2249+79 of the Canal. During the April 2006 inspection, the condition appeared very much the same as its condition in October 2003, when it was dewatered and surveyed. On the inlet side, there are a few stones missing at the base of the inlet structure and there is some shifting of some of the capstones.

On the outlet side, the entire dry-laid headwall has the appearance of being bowed inward. Additional inspection is required to determine the priority of repairs. Funding for this project is not included in this five-year program.

### **Canal Culvert Rehabilitation 2661+86 (Randolph Brook)**

The Randolph Brook culvert structure consists of three distinct sections. Looking downstream from the inlet, the culvert has a semicircular corrugated steel section that is 63 feet long, 13 feet wide and eight feet high, which runs beneath Weston Canal Road. The pipe abuts a six-foot long transition box or access chamber where the alignment of the structure shifts slightly to the left. A double barrel stone arched structure carries the Brook under the Canal into the Raritan River. The barrels measure approximately 139.5 feet long, five feet wide and 4.5 feet high.

The culvert was rehabilitated in 1990. The rehabilitation entailed the installation of a sleeve of steel liner plates within the arches of the main culvert barrels. Support for the liner plates was provided by newly poured concrete walls. The outlet headwall and timber apron were restored, preserving their historic appearance. During a recent inspection of County bridge No. H0703, County engineers noticed several pinhole leaks within the stone archway that connects to the left culvert barrel.

Additional inspection is required to determine the priority of repairs. Funding for this project is not included in this five-year program.

### **Canal Culvert Rehabilitation 2992+34 (Mile Run Culvert)**

The Mile-Run culvert consists of two semi-circular barrels that are approximately 129 feet long, which appear to be founded on natural rock. The culvert conveys Mile-Run Creek under the Canal and discharges into the Raritan River in the City of New Brunswick. The barrels are approximately twelve feet wide and six feet high. The culvert barrels were constructed of stone masonry and at some time, a brick liner was installed in the east barrel and a shotcrete coating was installed in the west barrel.

The culvert was rehabilitated in 1994. The rehabilitation was comprised of the restoration of the headwalls and deteriorated barrels. A structural steel liner was installed in the east barrel, set back 15 feet from the upstream end and 25 feet from the downstream end. The shotcrete liner in the west barrel was patched as needed.

A previous inspection revealed that the east barrel's first 25-foot brick liner section has minor spalls and the remaining metal liner section appears to be in good condition. On the west barrel it was observed that the gunite layer has spalled away at several locations at the mid-length of the barrel, above the footing.

Additional inspection is required to determine the priority of repairs. Funding for this project is not included in this five-year program.

### **Concrete Repairs at the Sullivan Way Aqueduct**

The Sullivan Way Aqueduct is located in the City of Trenton, Mercer County. The structure was constructed in the early 1900s and has been waterproofed and patched several times. The superstructure is a concrete encased steel structure constructed to carry the Canal over Sullivan

Way. The concrete on the abutments is spalling and needs attention. Funding for this project is not included in this five-year program.

### **Rehabilitation of the Four-Mile Spillway**

The Four-Mile Spillway is located in the section of the Canal between Five-Mile Lock and Route 18 in Franklin Township, Somerset County, opposite the Rutgers Preparatory School on Easton Avenue. This 600-foot spillway was rehabilitated in 1999 with the installation of a tremie concrete cutoff wall to eliminate leakage from the Canal. The spillway was finished with hand placed stones across the crest, the river side slope and the Canal side slope of the rehabilitated structure. The stones were laid in a mortar bed with a recess in the pointing finish.

Past flooding events washed away some of the cement from the mortar, leaving the stones sitting in a loose sand bed. The stones have the potential to become dislodged and the spillway crest needs to be stabilized. The planned rehabilitation will be to remove all stone from the crest, pour a concrete slab and rest the stones with ties to the concrete slab, similar to the recently completed rehabilitation of the Colonial Park Spillway. Recent inspections, however, show that the spillway appears stable, with grass growing between the stones. Funding for this project is not included in this five-year program.

### **Third Hand Shop Culvert under D&R Canal Cleaning (Partially Clogged)**

This culvert is located at approximate Station 592+00 of the Canal feeder section and consists of an 18-inch clay pipe that crosses under the D&R Canal. The inlet is located on the eastern end of Route 29 (inbound north). Solids and vegetation may be entering the culvert and partially clogging. An eventual cleanup of the pipe and/or installation of a cage at the inlet end may be recommended.

### **No-Name Culvert Under Canal at Sta. 936+50 Outlet Cleaning (Partially Clogged)**

This culvert crosses under the D&R canal and is located approximately 2600 feet downcanal from Wilburtha Road. The 2019 inspection revealed that the outlet is partially clogged by soil and debris. An inspection of the intake end of the culvert revealed that a big pool has built over time since the exit flow is poor. A cleanup of the culvert's outlet structure is recommended.

### **Pipeline Evaluation – Whitehouse Release Pipeline**

The Round Valley Release Pipeline (RVRP) conveys water from the Round Valley North Vault to the Whitehouse Release area and was also intended to carry water back to the reservoir from the planned Confluence Pumping Station. One pipe section of the 108-inch diameter prestressed concrete cylinder pipe ruptured in 1988 and numerous other sections were found to contain broken prestressing wire that may lead to additional ruptures of the pipe sections. The RVRP was converted into a gravity release pipeline in 1996 with the installation of pressure reducing valves in the North Vault. The reduced pressure design assumes that all the prestressing wire has failed and relies on the strength of the embedded steel cylinder. It was recommended that the pipeline continue to be monitored on a regular basis. The manufacturing and installation dates of

the specific pipe sections used in this release line fall within the range of dates when there were faulty materials being manufactured in the industry, resulting in failures of pipelines of similar vintage.

Funding for a more thorough evaluation by an outside consultant is not included in this five-year program; however, the Authority continues to conduct scheduled internal inspection of the release piping. Staff will continue its periodic inspection of the pipeline and take action accordingly.

### **Pipeline Evaluation - RV Force Main**

The Round Valley Force Main is a 3.5-mile long 108-inch diameter prestressed concrete cylinder pipe that conveys water from the South Branch Pumping Station (SBPS) to the South Dam Tower at Round Valley Reservoir. The Force Main can also be used for releases from the reservoir to the South Branch Raritan River.

Non-destructive testing of the Force Main was conducted in 1999. The non-destructive testing identified that the majority of the pipe sections were in very good condition. Approximately five percent of the 1,062 pipe sections exhibited anomalous readings that give rise to varying degrees of concern. One section of pipe, pipe section 42, located within the SBPS property, was excavated and further examined externally and internally. The examinations confirmed the results of the non-destructive testing. Instead of instituting a program to immediately replace pipe section 42 and other sections of pipe that were of concern, the Authority embarked on a program to develop a management plan to estimate the anticipated longevity of various pipe sections and prioritize pipe replacement.

Pipe section 42 was replaced in 2005 and was dismantled and tested in January 2006. Pipe section 42 was designed to have a double wrap of pre-stressing wire. The outer level of pre-stressing was missing, and the pipe section was considered to be structurally compromised. A stress of a large portion of the prestressing wire was significantly lower than its specified stress as determined by the strain gauge testing. With those structural deficiencies, the pipe was not in a state of incipient failure. Authority staff attempts to perform internal non-destructive pipe inspections that have a high probability of locating pipes in a state of incipient failure.

Funding for a more thorough evaluation by an outside consultant is not included in this five-year program; however, the Authority continues to conduct scheduled internal inspections of the force main piping. Staff will continue its periodic inspection of the pipeline and take action accordingly.

**PART III – PROPOSED RULE AMENDMENT**

NEW JERSEY WATER SUPPLY AUTHORITY

**Amendments To The Schedule Of Rates, Charges And  
Debt Service Assessments For The Sale Of Water From  
The Raritan Basin System**

**To Become Effective July 1, 2023**

The following rules and regulations can be found in the New Jersey Administrative Code under N.J.A.C. 7:11-1:27 and 7:11-2.1, et seq.

7:11-1:27 Recreational activities

- (a) (No change.)
- (b) (No change.)
- (c) 1. – 11. (No change.)

**12. Paragliding**

**13. Paramotoring**

**14. Operation of Unmanned Aircraft Systems (recreational or commercial)**

7:11- 2.3 General rate schedule for operations and maintenance

- (a)1.-7. (No change.)

8. Any other current costs, expenses or obligations required to be paid by the Authority under the provision of any agreement or instrument relating to bonds, other indebtedness of the Authority or by law. The current sales base of 182.339 million gallons per

day has been used in setting the rate listed in (b) below.

(b) General rate schedule for operations and maintenance:

<u>Period</u>	<u>Allocation</u>	<u>Rate/Million Gallons</u>
(State fiscal year unless otherwise indicated)		
State fiscal year [2023] <b>2024</b>	Million Gallons per Day (MGD)	[\$194.00] <b>\$203.00</b>

7:11-2.4 Debt service assessments

- (a) (No change.)
- (b) (No change.)

<u>Period</u>	<u>Allocation</u>	<u>Rate/Million Gallons</u>
(State fiscal year unless otherwise indicated)		
State fiscal year [2023] <b>2024</b>	Million Gallons per Day (MGD)	[\$85.00] <b>\$109.00</b>

7:11- 2.5 Capital Fund Component

(a)-(b) (No change.)

(c) Capital Fund Assessment

<u>Period</u>	<u>Allocation</u>	<u>Rate/Million Gallons</u>
(State fiscal year unless otherwise indicated)		
State fiscal year [2023] <b>2024</b>	Million Gallons per Day (MGD)	\$33.00

7:11- 2.6 Source Water Protection Fund Component

(a) (No change.)

(b) Source Water Protection Fund Assessment

<u>Period</u>	<u>Allocation</u>	<u>Rate/Million Gallons</u>
(State fiscal year unless otherwise indicated)		
State fiscal year [2023] <b>2024</b>	Million Gallons per Day (MGD)	[\$24.00] <b>\$20.00</b>

**APPENDICES**

**I. Report of Mercadien PC – Allocation of Headquarters General and Administrative Expenses – FY2024**

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**II. Report of Mercadien PC – Allocation of Headquarters General and Administrative Expenses – Audited FY2022 Expenditures**

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