

**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**

**ADJUSTMENT OF GENERAL RATE SCHEDULE FOR  
OPERATIONS AND MAINTENANCE FOR  
SALES BASE AND OPERATING EXPENSES FOR FISCAL YEAR 2019**

**ADJUSTMENT OF DEBT SERVICE ASSESSMENT AND SALES BASE FOR  
DEBT SERVICE PAYMENTS DUE AND REQUIRED FOR FISCAL YEAR 2019**

**ADJUSTMENT OF GENERAL RATE SCHEDULE FOR  
CAPITAL FUND COMPONENT FOR FISCAL YEAR 2019**

**ADJUSTMENT OF SOURCE WATER PROTECTION FUND  
COMPONENT FOR FISCAL YEAR 2019.**

**Proposed effective Date: July 1, 2018**

**Approved by the Board: 11/6/2017**

**NEW JERSEY WATER SUPPLY AUTHORITY  
PROPOSED RATE ADJUSTMENTS FOR FISCAL YEAR 2018  
RARITAN BASIN SYSTEM**

**Table of Contents**

**Contents**

PART I - EXPLANATION OF PROPOSED REVISED RATE STRUCTURE .....	3
Overview of Rate Proposal for Fiscal Year 2019 .....	3
Summary of Proposed Adjustments.....	3
Distribution of Headquarters General and Administrative Costs and Insurance Costs to all Operating Systems .....	5
Analysis of Significant Changes in Operations and Maintenance Expenses.....	6
Insurance Program .....	8
Interest Income.....	8
Reserve Contributions.....	9
Debt Service Assessments .....	9
Capital Fund Component .....	10
Source Water Protection Fund Component .....	11
Other Rule Amendments.....	11
PART II – DETAILED SUPPORTING INFORMATION .....	12
Table 1 - Summary Of Proposed Fiscal Year 2019 Adjustments.....	12
Table 2 - Rate History of Water Charges per Million Gallons of Raw Water Daily.....	13
Schedule Of Events.....	14
Fiscal Year 2019 Budget Summary .....	15
Schedule 1 - Proposed Operating Expenses Budget – Fiscal Year 2019 Distributed by Cost Center .....	16
Schedule 1A - Comparative Statement .....	17
Schedule 2 - List of Category 5340 Items Recommended Service & Maintenance Contracts	18
Schedule 3 - List of Category 5380 Items Recommended Professional Services .....	20
Schedule 4 - Projected FY 2019 New Jersey Water Supply Authority Insurance Program.....	22
Schedule 5 - Recap Of Allocation Of Headquarters General And Administrative Expenses Charged To The Manasquan Water Supply System .....	23
Schedule 6 - Proposed Capital Equipment Budget.....	24

Schedule 7 - Estimate Of Interest Income For Fiscal Year 2019 Budget.....	25
Schedule 8 - Unanticipated Revenue .....	26
Schedule 9 - Fund Balances as of 6/30/17 .....	27
Schedule 10 - Projected Fiscal Year 2019 Operations & Maintenance Component Sales Base .....	28
Schedule 11 - Operations And Maintenance Rate Component .....	30
Schedule 12 - Debt Service Rate Component For NJEIT Loan Repayment .....	31
Schedule 13 – Source Water Protection.....	32
Schedule 14 - Capital Improvement Program.....	33
PART III – PROPOSED RULE AMENDMENT .....	59
APPENDICES .....	i
I. Report of CLA PC – Allocation of Headquarters General and Administrative Expenses – FY2019 .....	i
II. Report of CLA PC – Allocation of Headquarters General and Administrative Expenses – Audited FY2017 Expenditures .....	ii

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

### **Overview of Rate Proposal for Fiscal Year 2019** **(July 1, 2018 - June 30, 2019)**

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, 2018.

#### **Summary of Proposed Adjustments**

<b>Component</b>	<b>Current (FY2018) Rates Per MG 7/1/2017 - 6/30/2018</b>	<b>Proposed (FY2019) Rates Per MG 7/1/2018 - 6/30/2019</b>
Operations & Maintenance Assessment	\$194.00	\$194.00
Debt Service Assessment Dredging & RV Structure Refurbishment	\$85.00	\$85.00
Capital Fund Component	\$33.00	\$33.00
Source Water Protection Fund Component	\$24.00	\$24.00
Total Rate	\$336.00 /mg	\$336.00 /mg

The General Rate Schedule for Operations and Maintenance (O&M) was last adjusted effective July 1, 2017 to cover the operating expenses of the System for FY2018. The FY2018 O&M sales base was 182.353 million gallons per day (mgd). The Authority anticipates the FY2019 O&M sales base to remain the same. The O&M Component is projected to remain the same for FY2019 at \$194.00 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 FY2019 require that an O&M Component of \$194.00 per million gallons be charged starting on July 1, 2018.

In recent fiscal years, the 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, specifically, those funds raised to pay debt service on the deferred dredging program. 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 \$781,990 in FY2018, and the amount available in FY2019 will increase to \$890,290. Overdraft sales decreased from \$267,337 in FY2018 to \$190,292 in FY2019. An additional \$700,000 in prior year positive budget variance is used in FY2019 to offset the O&M component. Without the use of any rate stabilization funds

in FY2019, the required O&M Component of the rate would be an additional \$13.38 per million gallons, for a total of \$207.38 per million gallons.

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 no increase in this component of the Rate of \$24.00 per million gallons in FY2019. The rate component supports debt service on acquired critical watershed parcels and matching dollars for watershed protection projects.

The Authority has submitted an application to the New Jersey Environmental Infrastructure Financing Program (NJEIFP) 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. The Authority has also submitted an application to the New Jersey Environmental Infrastructure Financing Program (NJEIFP) to finance the refurbish structures within the Round Valley Reservoir complex. The Authority proposes maintaining the NJEIFP rate component at \$85.00 per million gallons (\$60.00 per million gallons for the Round Valley refurbishment project and \$25.00 per million gallons for the dredging project) to fund the debt service in FY2019 for both 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 to keep it at the same rate of \$33.00 per million gallons in FY2019.

Table 1 on page 12 shows the maintenance of a stable rate for each of the rate components and reflects a total rate of \$336.00 per million gallons for FY2019.

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 12, 2018, at the Authority's Administration Building, 1851 Highway 31, Clinton, New Jersey.

A public hearing on the proposed rate adjustments is scheduled at 10:00 a.m. on Friday, February 9, 2018 at the Authority's Administration Building, 1851 Highway 31, Clinton, New Jersey.

The New Jersey Register Comment Period is scheduled to close on March 3, 2018 and the public hearing record on the proposed rate adjustments is scheduled to close on March 19, 2018.

Final action on the rate adjustment is scheduled for the Authority's June 4, 2018 meeting. The FY2019 rate will take effect on July 1, 2018.

### **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 FY2017 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 FY2019 budget based on the FY2017 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 FY2019 Raritan Basin System 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 \$13,885,581. This is \$343,094 more than the FY2018 budget of \$13,542,487. The Capital Equipment budget of \$140,500 is \$35,900 more than the FY2018 budget of \$104,600. 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 FY2018 levels. There are no contributions scheduled for the Depreciation Reserve and the Self-Insurance Reserve in FY2019. 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 from which the Authority is still recovering. 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. No additional funds are required in FY2019. All of these modifications result in a total FY2019 budget requirement of \$14,008,381 which is an increase of 2.7 percent relative to FY2018. (Page 15)

Sixteen of the thirty-one FY2019 direct operating expense accounts are projected to increase, but only six accounts by \$5,000 or more relative to FY2018. Six of the operating expense accounts are projected to decrease relative to FY2018. The most significant projected increases in the budget occur in Special and Professional Services and Service and Maintenance Contracts. In Salary and Fringe, regular salary is increasing by \$157,500; the pension payment is increasing by \$134,200. Retiree health benefits are decreasing by \$52,200 and assume 3 additional retirees between FY2018 and FY2019. Salaries and benefits constitute approximately 75.1 percent of the FY2019 operating budget, and are increasing approximately 2 percent relative to FY2018.

## Salaries and Benefits

Authority employees within Communications Workers of America (CWA) and the International Brotherhood of Electrical Workers (IBEW) are operating currently without a contract. The International Federation of Professional and Technical Engineers (IFPTE) contract has been negotiated. The previous contract expired June 30, 2015. The FY2019 budget assumes a 1.5% cost of living adjustment payable July 1, 2018 (the C.O.L.A. awarded to IFPTE). 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 Authority did not include any cost of living adjustments in the FY2019 budget for management. The Authority is budgeting 53 percent of the Salary budget for fringe benefits in FY2019, exclusive of retiree medical.

The initial estimate from the State of New Jersey for pension expense payable on April 1, 2018 is not yet available. The Authority has built in 16 percent per year growth in that expense item over actual FY2017. Although increases have stabilized in the last three 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 \$22,446 from \$214,500 to \$236,946 in FY2019. Overtime expenses are incurred within Security and O&M Facilities and Canal Operations principally (those areas operating within a crew or shift structure).

## 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. For 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 decreasing the retiree health benefits expense item in FY2019 by \$52,200. The Authority is budgeting three additional retirees in FY2019. The increase projected by State Health Benefits for 2018 for retiree medical is 0.0%. The Authority budgeted 0.0% and 10.0% increases for FY2018 and FY2019 respectively. The budget contains sufficient funds for 59 retired employees.

## Other Expense

### Electrical Service

The Authority's Hamden Pumping Station is utilized to pump water to the Round Valley Reservoir. The proposed budget remains the same for electricity costs for the normal operation of the pumping station of \$92,000 in FY2019. The Authority entered into a three-year contract



for power effective January 1, 2016. The rate reductions were only slight. The State of New Jersey prefers budget certainty and opts for longer term contracts over lower rates. The pumps are in a scheduled rehabilitation cycle and will be exercised as rehabilitated pumps are put back on line. The most recent pumping occurred in the spring of 2017. Pumping is funded from the Pumping Reserve (\$150,000 annual deposit).

### Special and Professional Services

The Authority is proposing to increase this line item from \$491,839 in FY2017 to \$554,243 in FY2019 representing additional parameters in United States Geological Survey gaging station costs. In other areas, pricing is stable. The line item also includes payments to the Governor's Authorities Unit, costs charged to the Authority by the Attorney General's Office for legal services provided, and the cost of the Authority's independent auditor.

### Heating Fuel and Vehicular Fuel

The cost of heating fuel is expected to increase from \$91,800 to \$98,000 and vehicular fuel is projected to remain the same at \$159,000 in FY2019. The prices of fuel in FY2019 are budgeted at \$2.25 per gallon for unleaded and \$2.35 per gallon for diesel.

### **Insurance Program**

The Authority is recommending an increase in insurance expense for FY2019 reflecting general market conditions based on the advice of the Authority's insurance broker and consultant. The Authority renewed the program effective March 1, 2017. March 1, 2019 will be the next remarketing. The Authority has included a \$26,442 increase in the insurance line item for FY2019 which is a 2 percent increase over budgeted FY2018.

Allocation of the Primary, Umbrella and Public Officials Liability insurance costs between 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 FY2019 are \$39,600 based upon current rates of .25 percent for Short-term investments and 1.30 percent on the Authority's long-term investments. This represents a decrease of \$1,100 from \$40,700 in FY2018. (Schedule 7, page 25) At the urging of the contractual water customers, in past years the Authority executed sweep contracts for its non-interest bearing accounts. After analysis, the Authority reversed the contracts because of increased costs assessed against the accounts. Due to the naturally low balances in these accounts and the large number of transactions, the transaction costs outstripped the sweep

interest earnings. Most of the Authority's short and long-term investments are either direct Treasury note investments or pegged to the Treasury bill.

### **Reserve Contributions**

During FY2019 the Authority will make no contribution to the Depreciation Reserve. The Depreciation Reserve is fully funded in FY2019 (Page 15).

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 FY2019. 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 and Round Valley Structure Refurbishment – Rehabilitation and Preservation Project**

The Authority has submitted an application to the New Jersey Environmental Infrastructure Financing Program (NJEIFP) to finance the dredging of 300,000 cubic yards from 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 is expected to cost approximately \$42,000,000 and last in duration up to three years. Funding through the NJEIFP 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. The expected closing on the bonds will be May of 2018 with the first debt service payment in August 2018. The project was originally scheduled to close in May of 2014 but was deferred four years. The Authority has also submitted an application to the New Jersey Environmental Infrastructure Financing Program (NJEIFP) 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 \$65,000,000 and last in duration for one year. Funding through the NJEIFP 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. The Authority proposes maintaining the rate component of \$85.00 per million gallons in FY2019 to assure that sufficient funds are available to make debt service payments for both projects. The total rate component will be adjusted after the bonds are issued in accordance with a final debt service schedule.

### **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 annual necessary 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 FY2019, 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, level funding over FY2018, should be assessed for FY2019 to generate approximately \$2,196,442. The Authority deems these revenues sufficient to meet its capital needs for FY2019 in light of existing capital reserves and excellent contract pricing, and to ensure that sufficient funds are committed to the continuing rehabilitation of Authority assets. The Authority is expecting to raise the Capital Fund Component of the Rate to \$45.00 per million gallons in FY2020 to assure that the projected capital needs, especially for repairs to the D&R Canal, are met within the five year program.

**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, 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; and a stream restoration project of a reach of the Mulhockaway which feeds into Spruce Run. 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 no change to this component of the Rate in FY2019.

**Other Rule Amendments**

There are no other rule amendments. The language supporting the overall proposal is contained beginning on page 59 of this document.

**PART II – DETAILED SUPPORTING INFORMATION**

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Table 1 - Summary Of Proposed Fiscal Year 2019 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 12/05/17	DIFFERENCE	PERCENTAGE INCREASE (DECREASE)
O & M Assessment	\$194.00	\$194.00	⇒ 0.00	0.00%
Debt Service Assessment Dredging & RV Structure Refurbishment	85.00	85.00	⇒ 0.00	0.00%
Capital Fund Component	33.00	33.00	⇒ 0.00	0.00%
Source Water Protection Component	24.00	24.00	⇒ 0.00	0.00%
Total Rate	\$336.00/mg	\$336.00/mg	⇒ 0.00	0.00%

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Table 2 - Rate History of Water Charges per Million Gallons of Raw Water Daily**  
Fiscal Year 2004 – Fiscal Year 2019

Effective Date	O&M Charge	1981 Bond Charge 7/1/86-10/30/06	1998 Bond Charge 8/1/98-11/1/13	2018 Bond Component 8/1/13-8/1/23	Capital Fund Component	Source Water Protection Component	Total Charge per MG	Percent Increase -Decrease
July 1, 2003	\$111.68	\$31.62	\$49.15		\$7.55	\$10.00	\$210.00	2.44%
July 1, 2004	122.75	28.31	41.71		12.23	10.00	215.00	2.38%
July 1, 2005	111.80	28.24	41.51		20.45	13.00	215.00	0.00%
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%

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYTEM

**Schedule Of Events**

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

To become effective July 1, 2018

**2017**

- SEPTEMBER 28 Advise Water Users of informal meeting.
- NOVEMBER 3 Informal meeting with Water Users – 10:00 AM.
- DECEMBER 4 Board reviews and approves proposed Rates.
- 22 Mail Official Notice to water customers, Rate Payer Advocate, interested parties and advertise in newspapers.

**2018**

- JANUARY 2 Publication in the New Jersey Register.
- 12 Pre-Pubic Hearing – 10:00 AM (within 45 days of Official Notice). Deadline for responses to inquires received prior to pre-public hearing.
- FEBRUARY 2 Deadline for receipt of comments to be addressed at Public Hearing (15 days after pre-public hearing).
- 9 Public Hearing Meeting. (SR Administration Building) – 10:00 AM Deadline for responses to inquires received between pre-public and public hearing.
- 26 Written responses to questions raised at Hearing (within 10 business days of the public hearing).
- MARCH 3 NJ Register Comment Period Ends.
- 19 Public Hearing record closes (25 business days after Public Hearing).
- JUNE 4 Board approval of FY 2019 Rates and Budgets.
- JULY 1 Effective date.

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Proposed**

**Fiscal Year 2019 Budget Summary**

(7/1/18 - 6/30/19)

	ADOPTED F/Y18	PROPOSED F/Y19
Proposed Operating Expense Budget (Schedule 1)	\$ 13,890,887	\$ 14,238,081
Net Allocation of Headquarters General and Administrative Expenses to the Manasquan Water Supply System - (Schedule 5)	\$ (763,000)	\$ (772,000)
Proposed Total Expense Budget	\$ 13,127,887	\$ 13,466,081
Proposed Capital Equipment Budget (Schedule 6)	\$ 104,600	\$ 140,500
Total Operating Expense & Capital Equipment Budgets	\$ 13,232,487	\$ 13,606,581
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	\$ 13,542,487	\$ 13,916,581
 <u>MISCELLANEOUS REVENUES:</u>		
Employee Housing/Land Rental	\$ (47,200)	\$ (47,200)
Receivable from the State of NJ and Other Reservoir Sites	\$ (5,000)	\$ (5,000)
Interest Earnings on Funds (Except Major Rehabilitation and Depreciation Reserve Fund) (Schedule 7)	\$ (40,700)	\$ (39,600)
	\$ (92,900)	\$ (91,800)
 <u>OTHER AVAILABLE FUNDS:</u>		
Funds Appropriated to Rate Stabilization Fund for use in F/Y2017 (Resolution #2294, dated 06/05/17)	\$ (781,990)	\$ -
Unanticipated Revenue (Schedule 8)		\$ (890,290)
Total Other Available Funds	\$ (781,990)	\$ (890,290)
Net Amount to be paid for O & M Component	\$ 12,667,597	\$ 12,934,491

Note 1. This amount is net of withdrawal from Depreciation Reserve.



NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 1 - Proposed Operating Expenses Budget – Fiscal Year 2019 Distributed by Cost Center**  
Fiscal Year 2019

CODE	ACCOUNT	OFFICE EXECUTIVE DIRECTOR	FINANCIAL MANAGEMENT & ACCOUNTING	WATERSHED PROTECTION PROGRAMS	OPERATIONS MAINTENANCE & ENGINEERING	PROPOSED BUDGET FOR FY19
5110	Regular Salaries & Wages	\$130,000	\$1,757,950	\$579,500	\$3,680,100	\$6,147,550
5120	Overtime-Salaries & Wages	0	128,246	0	108,700	236,946
5130	New Positions-Salaries & Wages	0	0	0	0	0
5140	Seasonal Help-Salaries & Wages	0	0	0	0	0
5150	Fringe Benefits	45,500	845,800	227,100	2,145,000	3,263,400
5167	Retiree Health Benefits	51,000	273,400	37,500	678,000	1,039,900
5168	Workers Compensation (Self-Insured)	0	10,000	0	0	10,000
	Total Salary & Fringe Benefits	\$226,500	\$3,015,396	\$844,100	\$6,611,800	\$10,697,796
5200	On-Site Residences	\$0	\$0	\$0	\$23,600	\$23,600
5210	Heating Fuel	0	0	0	98,000	98,000
5220	Utilities -Electrical Service	0	0	0	104,100	104,100
5230	" -Gas Service & Water	0	0	0	5,200	5,200
5240	" -Propane	0	0	0	500	500
5250	Electricity for Pumping	0	0	0	92,000	92,000
5260	Vehicular Fuel	0	159,000	0	0	159,000
5270	Oil & Grease	0	0	0	9,600	9,600
5280	Tires	0	0	0	21,000	21,000
5290	Maintenance Supplies	0	8,100	0	178,000	186,100
5300	Maint. Supplies - Vehicular Equipment	0	0	0	58,000	58,000
5310	Major Special Vehicle Service & Repair	0	0	0	85,000	85,000
5320	Agricultural Supplies	0	500	0	7,000	7,500
5330	Maintenance of Equipment	0	8,200	3,500	31,700	43,400
5340	Service & Maintenance Contracts	0	69,520	3,400	178,800	251,720
5350	Equipment Rental	0	24,850	0	32,700	57,550
5360	Household-Safety & Protective Supplies	100	27,400	0	8,200	35,700
5370	Uniforms	0	5,400	0	3,220	8,620
5380	Special & Professional Services	25,000	219,676	135,467	174,100	554,243
5390	Protective Services	0	1,326,442	0	0	1,326,442
5400	Telephone	0	83,000	0	2,400	85,400
5410	Postage & Freight	0	7,500	0	180	7,680
5420	Data Processing	0	39,000	0	0	39,000
5430	Printing & Office Supplies	1,500	44,450	9,000	8,500	63,450
5440	Scientific & Photographic	0	0	0	500	500
5450	Dues & Subscriptions	14,400	11,000	1,000	13,400	39,800
5460	Advertising	0	4,500	0	0	4,500
5470	Travel & Subsistence	1,500	1,980	1,500	1,600	6,580
5480	Staff Training & Tuition Aid	500	9,750	3,500	9,800	23,550
5490	Fees & Permits	0	112,100	0	11,750	123,850
5500	In-Lieu Taxes	0	18,700	0	0	18,700
	Total Operating Expenses	\$43,000	\$2,181,068	\$157,367	\$1,158,850	\$3,540,285
	GRAND TOTAL	\$269,500	\$5,196,464	\$1,001,467	\$7,770,650	<b>\$14,238,081</b>

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 1A - Comparative Statement**  
Fiscal Year 2019

CODE	ACCOUNT	FY'15 ACTUAL	FY'16 ACTUAL	FY'17 ACTUAL	FY'18 ADOPTED	FY'19 PROPOSED
5110	Regular Salaries & Wages	\$5,232,036	\$5,327,730	\$5,413,220	\$5,990,050	\$6,147,550
5120	Overtime-Salaries & Wages	176,438	193,406	265,792	214,500	236,946
5130	New positions-Salaries & Wages	0	0	150	0	0
5162	Retiree Unused Sick & Vacation	38,788	0	23,815	0	0
5150	Fringe Benefits	2,478,311	2,754,466	4,657,807	3,172,900	3,263,400
5167	Retiree Health Benefits	769,820	812,707	867,991	1,092,100	1,039,900
5168	Workers Comp. (Self Insured)	5,707	850	1,766	10,000	10,000
	Total Salary & Fringe	8,701,100	9,089,159	11,230,542	10,479,550	10,697,796
	Budget Salary & Fringe					
5200	Residences	\$77,320	\$25,013	\$24,679	\$26,600	\$23,600
5210	Heating Fuel	71,915	31,683	57,211	91,800	98,000
5220	Utilities -Electrical Service	105,818	80,151	92,554	110,500	104,100
5230	-Gas Service	4,234	4,093	4,171	4,800	5,200
5240	-Propane	271	834	219	500	500
5250	Electricity for Pumping Station	79,790	134,865	492,775	92,000	92,000
5260	Fuel - Vehicular	143,557	78,973	95,995	159,000	159,000
5270	Oil & Grease	6,041	5,606	7,650	9,200	9,600
5280	Tires	23,157	16,712	10,908	28,000	21,000
5290	Maintenance Supplies	147,168	152,302	151,949	183,800	186,100
5300	Maint. Supplies - Vehicular	47,617	69,029	58,231	56,000	58,000
5310	Major Vehicle Service & Repair	72,802	70,229	57,628	90,000	85,000
5320	Agricultural Supplies	3,008	2,550	4,472	5,500	7,500
5330	Maintenance Equipment	26,502	34,487	31,169	36,400	43,400
5340	Serv. & Maintenance Contracts	184,660	217,681	205,526	234,500	251,720
5350	Equipment Rental	42,988	38,002	32,345	51,550	57,550
5360	Household - Safety Supplies	26,899	31,543	39,518	33,800	35,700
5370	Uniforms	4,828	6,362	3,667	8,620	8,620
5380	Special & Professional Services	436,850	493,339	453,825	491,839	554,243
5390	Protective Services	1,188,766	1,142,799	1,126,790	1,300,000	1,326,442
5400	Telephone	83,797	81,248	82,167	83,000	85,400
5410	Postage & Freight Out	6,157	6,893	5,794	7,680	7,680
5420	Data Processing	40,023	36,336	34,933	38,788	39,000
5430	Printing & Office Supplies	46,225	42,595	31,846	51,800	63,450
5440	Scientific & Photographic	995	478	236	500	500
5450	Dues & Subscriptions	34,206	35,063	30,964	40,530	39,800
5460	Advertising & Promotional	3,898	5,746	23,078	4,500	4,500
5470	Travel & Subsistence	2,274	4,695	5,353	6,580	6,580
5480	Staff Training & Tuition Aid	8,352	9,507	19,111	20,050	23,550
5490	Fees & Permits	113,970	123,539	114,584	124,800	123,850
5500	In - Lieu Taxes	18,689	18,689	18,689	18,700	18,700
	Total Other Expenses	\$3,052,777	\$3,001,045	\$3,318,038	\$3,411,337	\$3,540,285
	Total Operating Expenses	\$11,753,877	\$12,090,204	\$14,548,580	\$13,890,887	\$14,238,081
	Annual Increase (Decrease)	-0.28%	2.86%	20.33%	-4.52%	2.50%
	Budget -other expenses	3,290,600	3,365,700	3,187,689	3,411,337	3,540,285
	ANNUAL BUDGET	\$12,823,900	\$13,157,000	\$13,491,339	\$13,890,887	\$14,238,081

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

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

Fiscal Year 2019

	ADOPTED F/Y18	PROPOSED F/Y19
1. Postage/Fax/ Misc. Machines (Dept. 16)	\$ 1,500	\$ 1,500
2. HIS-Safety Software (Dept. 17)	1,700	1,700
3. GO DADDY.COM - Remote Access Certificates (Dept. 17)	300	300
4. WMWARE (Dept. 17)	500	500
5. Sage Clients First MAS 100 (Dept. 17)	4,750	4,750
6. Western Technologies NJ Parcel Maps (Dept. 17)	1,400	1,400
7. Sage Fixed Asset (Dept. 17)	2,250	2,250
8. PV & Associates-Winslamm (Dept. 17)	500	500
9. People Trak Support Technical Difference (Dept. 17)	1,000	1,000
10. COMCAST - Cable Internet (Dept. 17)	4,280	4,800
11. Essention - Conservation Trak	5,000	5,000
12. Weebly (Web Hosting at Clinton) (Dept. 17)	200	200
13. Square Space (Web Hosting Watershed) (Dept. 17)	250	250
14. Symantec Anti-Virus Maintenance-Clinton (Dept. 17)	2,500	2,500
15. Sonic Wall Software (Dept. 17)	1,200	1,200
16. ESRI ArcView Maintenance-Watershed (Dept. 17)	5,400	5,400
17. CU Riverware Maintenance Agreement (Dept. 17)	3,400	3,500
18. Proofpoint Antispam (Dept. 17)	1,500	1,500
19. River Morph (Dept. 17)	500	500
20. DLT Solutions Autocad (Dept. 17)	1,500	1,500
21. Fastrax SBPS Monitoring Software (Dept. 17)	900	900
22. ESRI ArcView Maintenance-Clinton (Dept. 17)	800	500
23. Keystone Precision-GPS Software Maint. (Dept. 17)	800	800
24. HAAS Systems-Security Alarm Software Maint. (Dept. 17)	400	400
25. Clients First-Vipre Antivirus/Antispam (Dept. 17)	250	250
26. EZ Watch Security Video (Dept. 17)	900	900
27. Clients First - Server Software (Dept. 17)	1,000	1,000
28. Delmar Enterprises - Key Systems (Dept. 17)	520	520
29. Docusign (Dept. 17)	400	400
30. Yahoo for River Friendly (Dept. 20)	100	100
31. Janitorial Service (Dept. 20)	-	3,300
32. Refuse Collection (Dept. 31)	11,900	11,900
33. Janitorial Service (Dept. 31)	15,500	15,500
34. HVAC Service (Dept. 31)	5,500	5,500
35. Electrician & Plumber Services (Dept. 31)	5,000	5,000

(continued on next page)

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

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

Fiscal Year 2019

	ADOPTED F/Y18	PROPOSED F/Y19
36. Instrumentation Services (Dept. 31)	\$ 4,500	\$ 4,500
37. Entry Rugs (Dept. 31)	5,000	5,000
38. Carpet Cleaning (Dept. 31)	8,000	8,000
39. Generator Service-Administration Building (Dept. 31)	1,200	1,200
40. Underground Plant Location Service Notifications (Dept. 31)	1,500	1,500
41. Crane Service and Inspection (Dept. 31)	1,200	2,200
42. Elevator Service-SBPS (Dept. 31)	2,800	2,800
43. Electrical Service-SBPS (Dept. 31)	20,000	20,000
44. Miscellaneous (Dept. 31)	6,900	6,900
45. Floor Cleaning Maintenance-Office (Dept. 32)	2,600	-
46. Janitorial Service (Dept. 32)	8,000	8,000
47. Dumpster Service Canal Office (Dept. 32)	12,000	12,000
48. Dumpster Service Route 1 (Dept. 32)	30,000	42,000
49. UST Service (Dept. 32)	2,000	2,500
50. Instrumentation Service (Dept. 32)	1,000	1,000
51. Floor Mats (Dept. 32)	2,400	2,400
52. Grass Mowing Service (Dept. 32)	6,000	8,000
53. Boiler Service (Dept. 32)	500	500
54. Wood Disposal Fees (Dept. 32)	3,100	3,600
55. Generator Service-Scudders & Perdicaris (Dept. 32)	3,000	3,000
56. Johnny on the Spot - Rt. 202 (Dept. 32)	-	2,400
57. Vac Truck Service-IFW, 10 Mile PS (Dept. 32)	4,200	-
58. Welco Gas (Dept. 33)	1,000	1,000
59. Parts Washer & Hazardous Removal (Dept. 34)	1,000	1,000
60. Boom Lift Annual Inspection (Dept. 34)	900	900
61. Recycle Used Vehicle Fluids (Dept. 35)	500	500
62. Fire Extinguisher Maintenance (Dept. 36)	7,000	9,000
63. Hazardous Waste Control (Dept. 36)	1,500	1,500
64. Fire Alarm Testing (Dept. 36)	8,000	8,000
65. Vehicle Lifts Annual Testing (Dept. 36)	1,500	1,500
66. Delaware Electric Cellular Service (Dept. 37)	600	600
67. Dial My Calls (Dept. 37)	1,000	1,000
68. Miscellaneous (Dept. 37)	2,000	2,000
<b>TOTAL</b>	<b>\$ 234,500</b>	<b>\$ 251,720</b>

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

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

Fiscal Year 2019

	ADOPTED F/Y18	PROPOSED F/Y19
1. Services-Governor's Authorities Unit (Dept. 10)	\$ 25,000	\$ 25,000
2. Consultant-C.P.A. to Conduct Annual Audit (Dept. 13)	62,495	54,632
3. Services-GFOA Certificate Fee (Dept. 13)	500	500
4. 125 Plan-Family security Insurance Agency (Dept. 13)	2,496	2,496
5. Archiving (Dept. 13)	-	6,000
6. Services-Pre-Employment Exams & Tests (Dept. 14)	3,300	3,300
7. Fidelifax-Background Checks (Dept. 14)	2,248	2,248
8. Medical CDL Drug Testing (Dept. 14)	1,600	1,600
9. Employee Advisory Service (Dept. 14)	2,500	2,500
10. 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)	36,500	43,500
11. Insurance Broker-HRH (Dept. 15)	40,000	45,000
12. GL Administrator (ESIS) (Dept. 15)	800	1,000
13. Services-Attorney General's Office - Assistance of Deputy Attorney General concerning a wide range of legal matters (Dept. 15)	40,000	40,000
14. Miscellaneous (Dept. 15)	10,300	-
15. MP Water Monitoring Costs - USGS SR @ Glen Gardner (Dept. 20)	17,600	9,560
16. MP Water Monitoring Costs - USGS SB Raritan @ Stanton (Dept. 20)	-	7,920
17. MP Water Monitoring Costs - USGS Landing Lane (Dept. 20)	34,100	34,804
18. MP Water Monitoring Costs - USGS Raritan River @ Manville (Dept. 20)	45,100	45,958
19. Water Monitoring Costs ASWQMN- USGS D&R Canal @ Landing Lane (Dept. 20)	-	7,500
20. Water Monitoring Costs ASWQMN - NJDEP Mulhockaway @ Van Syckel (Dept. 20)	5,500	7,500
21. Additional Flow Measure at SR, Stanton, Manville & Calco Dam (Dept. 20)	-	6,425
22. Water Monitoring-SBWA/URWA now RHA (Dept. 20)	2,000	2,000
23. Water Monitoring-SBMWA (Dept. 20)	1,500	1,500

(continued on next page)

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 3 (Cont.) - List of Category 5380 Items Recommended Professional Services**  
Fiscal Year 2019

	ADOPTED F/Y18	PROPOSED F/Y19
24. Dash for the Trash (Dept. 20)	\$ 1,000	\$ 1,000
25. Lab Certification WPU/Water Sample Analysis (Dept. 20)	1,500	1,500
26. NJ Invasive Species Strike Team (Dept. 20)	300	300
27. Lockatong ISCO Monitoring (Dept. 20)	5,600	5,600
28. D&R Canal ISCO Monitoring (Dept. 20)	1,300	1,300
29. Cedar Grove Brook ISCO Monitoring (Dept. 20)	2,600	2,600
30. Services-Emergency Engineering Services (Dept 30)	2,500	2,500
31. Underground Storage Tank-CEA Report (Dept. 30)	11,000	11,000
32. Underground Storage Tank Groundwater Test (Dept. 30)	2,500	2,500
33. Services - USGS Cooperative Agreement River Gauging - Maintenance of Raritan Basin Stream Gauging Stations and the Delaware & Raritan Canal Gauging at Kingston per USGS/DWR/NJWSA Agreement (Dept. 31)	68,000	68,000
34. Services-USGS Spruce Run Gauging	17,000	17,000
35. Maintenance of two stations on Streams feeding Spruce Run not covered under State Cooperative Agreement (Dept. 31)		
36. Water Testing and Sampling to comply with the Safe Water Drinking Act (Dept. 31)	2,400	2,400
37. Services-Water Sampling and Testing as per NJDWR Requirements - RT 202 Stockpile Site (Dept 32)	5,700	6,000
38. Maintenance of USGS Gauges at Washington Crossing and 10-mile and others (Dept. 32)	20,000	60,500
39. Vac Truck Service - IFW, 10 Mile PS	-	4,200
40. Safety Suggestion Program, Poster and Promotional Materials, Safety Incentive Program (Dept. 36)	9,700	9,700
41. Pulmonary Testing and Physicals (Dept. 36)	5,000	5,000
42. Annual Contributions to Fire Companies and Rescue Squads (Dept. 36)	500	500
43. Hepatitis Vaccinations (Dept. 36)	800	800
44. Calibration for the Pota-Count Respirator (Dept. 36)	900	900
<b>TOTAL</b>	<b>\$ 491,839</b>	<b>\$ 554,243</b>

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 4 - Projected FY 2019 New Jersey Water Supply Authority Insurance Program**

<b>Policy</b>	<b>Raritan Basin System</b>	<b>Manasquan Reservoir System</b>	<b>Manasquan Water Treatment Plant and Transmission System</b>	<b>Total Premium</b>
<b>Property</b> Limit \$150 million, Limit \$25m BI Deduct: \$100k all perils \$250k Deduct dams, dikes / \$1m Deduct Canal flood	\$618,526	\$207,930	\$50,886	\$877,342
<b>General/Products Liability</b> Limit \$1 million Deduct: \$150k	\$107,826	\$10,081	\$2,093	\$120,000
<b>Environmental Impairment Liability</b> Limit \$10 million Deduct: \$100k	\$22,464	\$2,100	\$436	\$25,000
<b>Workers' Compensation</b> Limit \$1 million	\$217,692	\$27,986	\$29,323	\$275,000
<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	\$283,672	\$26,521	\$5,507	\$315,700
<b>Business Automobile</b> Limit: \$1 million G/L, \$0 pd Deduct: \$50k, G/L	\$25,213	\$4,476	\$1,025	\$30,714
<b>Management Liability</b> Public Officials Liability Cyber Risk Fidelity & Crime Limit \$5 million/\$1million/\$1 million Deduct: \$100k/\$10k/\$50k	\$44,961 \$5,212 <hr/> \$50,173	\$4,204 \$487 <hr/> \$4,691	\$873 \$101 \$4,000 <hr/> \$4,974	\$50,038 \$5,800 \$4,000 <hr/> \$59,838
<b>Travel Accident</b> Limit \$2 million	\$876	\$82	\$17	\$975
<b>TOTAL:</b>	\$1,326,442	\$283,867	\$94,261	\$1,704,569

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 2019 (7/1/18-6/30/19)

	<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 F/Y19 (7/1/18-6/30/19)	\$810,843	\$698,565	\$112,278
F/Y17 Adjustment as per audited Expenditures:			
Budgeted as per rate schedule for F/Y17 (7/1/16-6/30/17). Amounts paid during F/Y17 to Raritan Basin System.	\$744,000	\$640,000	\$104,000
Actual allocation based upon audited expenditures F/Y17 (7/1/16-6/30/17) - Appendix II	<u>\$704,676</u>	<u>\$607,100</u>	<u>\$97,576</u>
Adjustments F/Y17	<u>(\$39,324)</u>	<u>(\$32,900)</u>	<u>(\$6,424)</u>
Net Allocation for F/Y2019 Budget	<u><u>\$771,519</u></u>	<u><u>\$665,665</u></u>	<u><u>\$105,854</u></u>
Estimate	<u>\$772,000</u>	<u>\$666,000</u>	<u>\$106,000</u>



NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 6 - Proposed Capital Equipment Budget**  
Fiscal Year 2019

	Description	(R) Replacement (A) Addition	Year of Purchase	Dollar Value	Depreciation Reserve
<b>INFORMATION SYSTEMS</b>	(1) PLOTTER	(R) FF2012	2006	7,500	5,735
	(1) EZ WATCH COMPUTER (SEC. CAM.)	(A)		4,000	
<b>FACILITIES</b>	(1) ROLL UP DOOR SR TOWER	(A)		10,000	
	(1) DOOR INSTALLED IN SR VAULT	(A)		10,000	
	(1) LUMBER RACKS	(A)		10,000	
	(1) METAL BAND SAW	(R) NOT FOUND		8,500	
	(1) CORDLESS PRO-PRESS PLUMBING TOOL	(A)		3,000	
	(1) NJWA-19 REPLACEMENT	(R) TR2006	2006	30,000	25,536
	(1) NJWA-21 REPLACEMENT	(R) TR1842	2002	35,000	19,280
(1) NJWA-22 REPLACEMENT	(R) TR1962	2005	40,000	27,289	
<b>GROUND</b>	(1) PONTOON BOAT W/TRAILER AND MOTOR	(R) EQP538	1977	32,000	3,081
	(1) HEAVY DUTY MOWER HEAD (FLAIL)	(A)		12,000	
	(1) TOW BEHIND AIR COMPRESSOR	(R) PE 1480	1994	15,000	11,566
<b>CANAL</b>	(1) UTILITY BODY TRUCK W/PLOW (REPLACE NJWA-49)	(R) TR2079	2008	55,000	31,901
	(1) UTILITY BODY TRUCK (REPLACE NJWA-58)	(R) TR2048	2007	50,000	28,776
	(1) SKID LOADER W/ATTACHMEMENTS	(A)		90,000	
	(1) DUMP BODY FOR MASON DUMP (REPLACE NJWA-41)	(R) TR2089	2008	12,000	
<b>AUTO SHOP</b>					
<b>SAFETY</b>					
<b>SECURITY</b>	(1) SECURITY VEHICLE - NJWA-17 JEEP PATRIOT	(R) TR2248	2015	32,000	12,345

	TOTAL COST	\$456,000	\$165,509
LESS AMOUNT CHARGED TO DEPRECIATION RESERVE		(165,509)	
	NET TOTAL	\$290,491	
LESS AMOUNT CHARGED TO CAPITAL EQUIPMENT RESERVE		(\$150,000)	
	TOTAL	\$140,491	
	AMOUNT FUNDED FOR FY2019	<b>\$140,500</b>	

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 7 - Estimate Of Interest Income For Fiscal Year 2019 Budget**

Fund/Reserve	TD Bank Funds	Long-Term Investments
Operating	\$ 1,050,000	\$ -
Reserve for O & M	2,100,000	1,450,000
Pumping Reserve	1,200,000	-
Self-Insurance Reserve	300,000	690,000
Rate Stabilization Fund	80,000	-
Estimated Total	\$ 4,730,000	\$ 2,140,000
	\$4,730,000 x .25% =	\$ 11,825
	\$2,140,000 x 1.30% =	\$ 27,820
	Total	\$ 39,645
	Estimate	\$ 39,600

Short-Investments

TD Bank  
Managed Rate of .25%  
95% of the 30 Day Libor After the  
Compensating Balance Has Been Satisfied

Long-Term Investments

JP Morgan  
New Jersey State G/O Bonds  
Various Due Dates and Yields to Maturity

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 8 - Unanticipated Revenue**

Funds to be appropriated Into the Rate Stabilization Fund for Fiscal Year 2019

	Amount
F/Y2017 Net Year-End Balance	\$700,000.00

<u>Overdrafts</u>	<u>Invoice No.</u>	<u>Billed</u>	<u>Amount</u>
City of New Brunswick	1355	01/01/17	\$7,838.65
Heron Glen	1328	11/01/16	142.27
Middlesex Water Company	1329	11/01/16	10,706.76
	1338	11/01/16	10,742.89
NJ American	1341	12/01/17	52,100.80
	1326	11/01/16	158,400.27
Princeton Plasma	1330	11/01/16	300.27
Raritan Valley Country Club	1386	02/01/17	2,530.14
	1342	12/01/16	2,236.41
	1331	11/01/16	2,186.66
Roxiticus	1332	11/01/16	318.17
Royce Brook Golf Club	1333	11/01/16	747.95
Somerset County Park Commission	1334	11/01/16	687.67
Stonebridge Community Associates	1327	11/01/16	17.83
Township of East Brunswick	1339	11/01/16	2,625.84
Trump National Golf Course	1335	11/01/16	902.88
Village Grande at Bear Creek	1336	11/01/16	396.02
		Total	\$252,881.48
		Amount used in FY2018	-\$62,589.00
		NET	\$190,292.48

Overdrafts Not Billed, Accrued through July, 2017

NJ American, Raritan Valley Country Club, Royce Brook Golf Club, Roxiticus, Somerset County Parks, Trump National Golf Course	\$0
<u>Other Sources of Funds</u>	

	Grand Total	\$890,292.48
	FY19 Budget	\$890,290.00

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

**Schedule 9 - Fund Balances as of 6/30/17**

\*\*Final\*\*

	REVENUE FUND	OPERATING ACCOUNT	OPERATING FUND	O & M RESERVE	LONG-TERM INVESTMENTS O & M RESERVE	TOTAL
BALANCE 6/30/17	\$1,176,243	\$3,378,152	\$1,052,319	\$2,186,689	\$1,474,539	\$9,267,942
Deduct: Accrued expenses to be paid as of 6/30/17			(86,679)			(86,679)
Deduct: June 1st billing, received			(1,164,528)			(1,164,528)
Adjusted Balances 6/30/17	\$1,176,243	\$3,378,152	(\$198,888)	\$2,186,689	\$1,474,539	\$8,016,735
<b>INCOME</b>						
Reimbursement Manasquan						
Receipt of Headquarters Overhead Expenses for 7/10/17			160,000			160,000
Operating transfer	(1,100,000)	(3,300,000)	4,400,000			0
<b>EXPENSES</b>						
O & M Expenses - (A/P 6/30/17)						
Includes accrued Payroll and Insurance thru 6/30/17			(265,108)			(265,108)
Capital items to be purchased by 6/30/17			(104,771)			(104,771)
Various Reserve contributions (one month)			0			0
PROJECTED BALANCE AT 6/30/17	\$76,243	\$78,152	\$3,991,233	\$2,186,689	\$1,474,539	\$7,806,856

Note 1. Unanticipated Revenues for F/Y 19

(overdrafts in F/Y 17 to be available for appropriation to Rate Stabilization for FY17/FY19)

City of New Brunswick	\$7,838.65
Heron Glen	\$142.27
Middlesex Water Company	21449.65
NJ American	\$210,501.07
Raritan Valley Country Club	\$6,953.21
Roxiticus	\$318.17
Royce Brook Golf Club	\$747.95
Somerset County Park Commission	\$687.67
Stonebridge Community Associates	\$17.83
Township of East Brunswick 1079	\$2,625.84
Trump National Golf Course 1089	\$902.88
Village Grande at Bear Creek 1090	\$396.02
	<u>\$252,581.21</u>

Less: FY2018 O & M reserve balance (3 mos required by resolution) (3,498,872)

Adjusted balance of funds available 6/30/17 4,307,984

Use of Available Funds

Unanticipated revenues (overdrafts in F/Y 17 to be available for appropriation to Rate Stabilization Fund for FY18/FY19 (Note 1)) (252,581)

Rate Stabilization Fund Transfer for FY18 (781,990)

Projected Net Balance

**\$3,273,413**

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 10 - Projected Fiscal Year 2019 Operations & Maintenance Component**  
**Sales Base**

New Jersey Environmental Infrastructure Financing Program  
Debt Service Assessment

USER	DAILY ALLOCATION (MGD)	DAYS PER YEAR	TOTAL MG/YR	ANNUALIZED SALES BASE (MGD)
Duke Farms	0.075	N/A		0.000
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	0.150	365	54.750	0.150
Trenton Country Club	0.126	365	46.000	0.126
United 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 2019 Operations & Maintenance Component**  
**Sales Base**

New Jersey Environmental Infrastructure Financing Program  
Debt Service Assessment

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
Renaissance at Monroe Condominium Association	0.014	365	5.110	0.014
<b>TOTAL SALES BASE</b>				<b>182.353</b>

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 11 - Operations And Maintenance Rate Component**  
Fiscal Year 2019

Funds Required for F/Y2019 Budget

Proposed Operating Expense and Capital Budget	\$13,916,581
Less Miscellaneous Revenues & Interest Income	(\$91,800)
Other Available Funds	(\$890,290)
Net Budget Requirement	\$12,934,491
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 6/30/19	 \$10,776,691

Computation of Operations & Maintenance Rate for Fiscal Year 2019

Sales Base		
Period 7/1/18 to 4/30/19 304 days x 182.353 mgd	=	55,435.31 mg
 Required Operations & Maintenance Rate F/Y2019		
	$\frac{\$10,776,691 \text{ mg}}{55,435.31 \text{ mg}}$	= \$194.00 mg

NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 12 - Debt Service Rate Component For NJEIT Loan Repayment**

Effective July 1, 2018, (F/Y2019, July 1, 2018-June 30, 2019)

Total due on Principal and Interest \$ 5,692,172 /year

$$\text{Debt Service Rate for NJEIT Loan} = \frac{\$5,692,172}{182.353 \text{ mgd} \times 365 \text{ days}} = \$85.00 /\text{mg}$$

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



NEW JERSEY WATER SUPPLY AUTHORITY  
RARITAN BASIN SYSTEM

**Schedule 13 – Source Water Protection**

Dedicated Land	\$19.50	\$19.50	\$19.50	\$19.50	\$19.50
Dedicated WSP	\$4.50	\$4.50	\$4.50	\$4.50	\$4.50
Sales Base	182.271	182.339	182.339	182.353	182.353
	-0.0055%	0.0373%	0.0000%	0.0077%	0.0000%
<b>Source Water Protection Fund</b>	<b>Actual</b>	<b>Actual</b>	<b>Actual</b>	<b>Adopted</b>	<b>Proposed</b>
	<b>FY'15</b>	<b>FY'16</b>	<b>FY'17</b>	<b>FY'18</b>	<b>FY'19</b>
Fund Component Rate	<b>\$24.00</b>	<b>\$24.00</b>	<b>\$24.00</b>	<b>\$24.00</b>	<b>\$24.00</b>
Annual Household Impact	\$2.52	\$2.52	\$2.52	\$2.52	\$2.52
Opening Balance July 1	\$3,178,568	\$3,712,909	\$4,248,260	\$4,762,469	\$4,122,936
Total Rate Component	<u>1,596,600</u>	<u>1,602,000</u>	<u>1,597,200</u>	<u>1,597,412</u>	<u>1,597,412</u>
Rate Component Watershed	299,380	299,492	299,492	299,515	299,515
Rate Component Land	1,297,536	1,302,508	1,298,708	1,297,897	1,297,897
Interest and Other Additions	<u>4,595</u>	<u>6,404</u>	<u>10,194</u>	<u>6,659</u>	<u>6,095</u>
Total Available	<u>4,780,079</u>	<u>5,321,313</u>	<u>5,856,654</u>	<u>6,366,540</u>	<u>5,726,443</u>
Available Watershed	1,797,035	2,096,527	2,396,019	2,668,830	1,918,830
Expenditure Watershed	<u>0</u>	<u>0</u>	<u>26,703</u>	<u>1,049,515</u>	<u>521,500</u>
Balance Watershed	<u>1,797,035</u>	<u>2,096,527</u>	<u>2,369,316</u>	<u>1,619,316</u>	<u>1,397,330</u>
Available Land	2,983,044	3,224,787	3,460,636	3,697,710	3,807,613
P/D & Adm/ & Cash for Easement:	7,868	37,600	10,375	90,000	90,000
Property Administrators	0	0	0	0	0
Debt Service & Trust Fees Land	1,059,302	1,035,453	1,057,107	1,104,090	1,105,022
Other Land Expenditure					
Total Expenditure Land	<u>1,067,170</u>	<u>1,073,053</u>	<u>1,067,483</u>	<u>1,194,090</u>	<u>1,195,022</u>
Balance Land	<u>1,915,874</u>	<u>2,151,734</u>	<u>2,393,153</u>	<u>2,503,620</u>	<u>2,612,591</u>
Total Project Expenditures	<u>1,067,170</u>	<u>1,073,053</u>	<u>1,094,186</u>	<u>2,243,604</u>	<u>1,716,522</u>
Ending Balance June 30	<u><u>\$3,712,909</u></u>	<u><u>\$4,248,260</u></u>	<u><u>\$4,762,469</u></u>	<u><u>\$4,122,936</u></u>	<u><u>\$4,009,921</u></u>

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

**Schedule 14 - Capital Improvement Program**  
Fiscal Years 2018-2022

Rate Assumption Per Million Gallons:

PROJECT	ESTIMATED	Period	Priority	Rate Assumption Per Million Gallons:					
	PROJECT COST	First Identified		Prior Years	\$33 FY 2018	\$33 FY 2019	\$45 FY 2020	\$45 FY 2021	\$55 FY 2022
Dredging Kingston & Amwell Road - Design engineering only	\$ 2,261,712	2006	High	1,969,327	292,385				
Dredging Kingston & Amwell Road - Construction Rt 202 Stockpile site only	\$ 1,500,000	2006	High	-	1,500,000				
Dredging Kingston & Amwell Road - Construction engineering only (bond)	\$ -	2006	High	-	-				
Dredging Kingston & Amwell Road - Construction \$52M (bond)	\$ -	2006	High	-	-				
Rehabilitate Western Embankment Stockton Borough	\$ 3,750,000	2006	High	172,037	130,000	3,447,963			
Rehab Swan Creek Culvert & Aqueduct new project incl culvert liner work	\$ 2,000,000	2015	High	957,561	100,000	100,000	500,000	1,300,000	
Dam Impmnts as recommended by TRB (preliminary eng and Owners eng)	\$ 2,500,000	2013	High	2,044,184	100,000	175,000	180,816		
RV Res Dams-Rehab & Resource Preservation Project (eng only)	\$ 5,000,000	2015	High	1,036,802	3,500,000	463,198			
Round Valley Dam Improvements - Construction (bond)	\$ -	2015	High	-	-				
Construction eng management for RV dam improvements (bond) Est. \$5M	\$ -	2015	High	-	-				
Rehabilitate hydraulic valve on RV South Dam low level release (bond)	\$ -	2015	High	-	-				
Rehab 10-inch cast iron pipe connect RV-S dam vault to Forcemain (bond)	\$ -	2015	High	-	-				
Grouting abutments of RV embankments (bond)	\$ -	2016							
Dredging chanel intake to RV South Dam Tower (bond)	\$ -	2016							
Security Improvements at RV reservoir (cameras)	\$ 700,000	2016	High	-	400,000	300,000			
Security Improvements at RV and SR (Perimeter hardening)	\$ 800,000	2017	High	-	200,000	200,000	200,000	200,000	
New 2D Inundation mapping for Round Valley and Spruce Run Reservoir	\$ 500,000	2015	High	14,128	100,000	385,872			
Rehab of 10-Mile Waste Gate	\$ 160,000	2010	High	11,069	148,931				
Dredging of Intake Pond and replace ice deflectors at SBPS	\$ 1,750,000	2005	High	43,086	150,000	1,556,914			
Griggstown Waste Gate - Repair @ Station 2083+40	\$ 300,000	2017	High	16,670	283,330				
Rehab of 6-Mile Run Culvert	\$ 1,000,000	2008	High	-	250,000	500,000	250,000		
West Amwell Rehab Stone Masonry Wall @ Station 411+37	\$ 250,000	2017	High	42,920	207,080				
Replace Fuel system pumps and software/inventory system at Spruce Run Ac	\$ 250,000	2017	High	-	75,000	175,000			
Replace office phone system	\$ 75,000	2017	High	-	75,000				
Blackwells Mills Seepage Repairs @ Station 2334+67	\$ 260,000	2017	High	31,700	228,300				
	\$ 23,056,712								
Rehab of Upper Canal Embankment - Raven Rock to Prallsville	\$ 4,250,000	2006	Med High	104,539	50,000	1,000,000	1,000,000	1,000,000	1,095,461
Rehab of Canal Flow Control Structures Griggstown and 10-Mile Locks	\$ 1,500,000	2000	Med High	-	-			50,000	1,450,000
Refurbishment of the Main Pumps & Motors 4, 5, 7, & 8	\$ 2,800,000	2008	Med High	-	600,000	2,200,000			
Removal of Sediment from Rt. 1 Conduit	\$ 25,000	2013	Med High	-	25,000				
Rehab of the Landing Lane Spillway and rehab slope d/s of Island Farm Weir	\$ 1,000,000	2013	Med High	402	150,000	849,598			
Rehab of Spruce Run Weir	\$ 800,000	2016	Med High	-		60,000	740,000		
Repair of Pipe at Whitehead Road	\$ 500,000	2012	Med High	-				500,000	
Rehabilitation Work at Washington Crossing Spillway	\$ 300,000	2012	Med High	-				300,000	
Security System and Upgrades (Clinton and Canal)	\$ 275,000	2003	Med High	100,992	75,000	25,000	25,000	25,000	24,008.38
	\$ 11,450,000								
Alexauken Creek Aqueduct	\$ 750,000	2015	Medium					500,000	250,000
Rehabilitation of Carnegie Lake Creek Aqueduct	\$ 100,000	2015	Medium	14,400	25,000	60,600			
Replace Fixed Cone Valves at Spruce Run Vault	\$ 400,000	2017	Medium	-					400,000
Replacement of Through the Wall HVAC Units in SRA	\$ 150,000	2011	Medium		150,000				
Rehab of Culvert at Station 2550+90 (1 mile upstream of 10-mile)	\$ 700,000	2008	Medium						700,000
Rehab of Traprock Spillway	\$ 1,200,000	2010	Medium						1,200,000
	\$ 3,300,000								
Dredging between Landging 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						
Clearing Spruce Run Spillway	\$ -	2017	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 Waste Gate d/s of 10 Mile - woodwork on façade	\$ -	1990	Low						
Rebuild Stone Embankment at the 10 Mile Waste Gate	\$ -	1990	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 Spillway u/s of Griggstown Lock	\$ -	2010	Low						
Rehab of the Four Mile Spillway	\$ -	2010	Low						
Pipeline Evaluation - Whitehouse Release Pipeline	\$ -	1990's	Low						
Pipeline Evaluation - RV Force Main	\$ -	1990's	Low						
	\$ -								
<b>TOTAL</b>	<b>\$ 38,764,273</b>		-	<b>6,559,816</b>	<b>8,815,026</b>	<b>11,499,146</b>	<b>2,895,816</b>	<b>3,875,000</b>	<b>5,119,469</b>
<b>Balance CIP</b>				<b>17,902,828</b>	<b>11,320,244</b>	<b>2,053,540</b>	<b>2,197,078</b>	<b>1,353,226</b>	<b>(69,507)</b>

The estimated project costs listed includes engineering, cultural, construction and miscellaneous expenses.

Funds in CIP as of June 30, 2017 is \$11,902,828 plus \$6,000,000 from Capital Improvements Investments

Estimated cost for dredging of the Canal between Kingston & Amwell Road is \$52,000,000 plus engineering & Cultural Resource inspections during construction.

The cost of removal of sediment from the 202 stockpile site is included in the CIP since it will not be part of the NJEIT bonding. Engineering and cultural costs during construction will be included in loan for project.

Round Valley Dam Improvements: Costs of remedial work will need to be bonded. Estimate \$75 million plus engineering construction management and inspection.

This does not include expenditure of \$76,156.67 for Sinkhole Emergency Repair D&R 1265-00

**RARITAN BASIN SYSTEM  
CAPITAL IMPROVEMENT PROGRAM  
Fiscal Years 2018 – 2022  
Updated – August 2017**

The following is a description of projects that the Authority anticipates being funded from the Capital Improvement Program (CIP) in Fiscal Years 2018 – 2022. Discussion also includes projects that may be delayed beyond FY 2022 due to funding.

<b>HIGH PRIORITY</b>
Dredging Kingston & Amwell Road - Design Engineering only
Dredging Kingston & Amwell Road - Construction Rt 202 Stockpile Site only
Dredging Kingston & Amwell Road - Construction Engineering only (bond)
Dredging Kingston & Amwell Road - Construction \$52M (bond)
Rehabilitate Western Embankment Stockton Borough
Rehabilitate Swan Creek Aqueduct & Culvert New Project Includes Potential Culvert Liner Work
Dam Improvements As Recommended By Technical Review Board (preliminary engineering and Owners engineering)
RV Reservoir Dams - Rehabilitate & Resource Preservation Project (eng only)
Round Valley Dam Improvements - Construction (bond)
Construction Engineering Management for RV Dam Improvements (bond) Est. \$5M
Rehabilitate Hydraulic Valve on RV South Dam Low Level Release (bond)
Rehabilitate 10-inch Cast Iron Pipe that Connects RV-S Dam Vault to Forcemain (bond)
Grouting Abutments of RV Embankments (bond)
Dredging Channel Intake to RV South Dam Tower (bond)
Security Improvements at RV Reservoir (cameras)
Security Improvements at RV and SR (Perimeter hardening)
New 2D Inundation Mapping for Round Valley and Spruce Run Reservoirs
Rehabilitate of 10-Mile Waste Gate
Dredging of Intake Pond and Replace Ice Deflectors at SBPS
Griggstown Waste Gate - Repair @ Station 2083+40
Rehabilitate of 6-Mile Run Culvert
West Amwell Rehabilitate Stone Masonry Wall @ Station 411+37
Replace Fuel System Pumps and Software/Inventory System at Spruce Run Administration Building
Replace Office Phone System Authority-Wide
Canal Seepage Repairs Blackwells Mills @ Station 2334+67
<b>MEDIUM / HIGH PRIORITY</b>
Rehabilitation of Upper Canal Embankment - Raven Rock to Prallsville
Rehabilitation of Canal Flow Control Structures Griggstown and 10-Mile Locks

Refurbishment of the Main Pumps & Motors 4, 5, 7, & 8
Removal of Sediment From Rt. 1 Conduit
Rehabilitation of the Landing Lane Spillway and Slope downstream of Island Farm Weir
Rehabilitation of Spruce Run Weir
Repair of Pipe at Whitehead Road
Rehabilitation Work at Washington Crossing Spillway
Security System and Upgrades (Clinton and Canal)
<b>MEDIUM PRIORITY</b>
Alexauken Creek Aqueduct
Rehabilitation of Carnegie Lake Creek Aqueduct
Replace Fixed Cone Valves at Spruce Run Vault
Replacement of Through the Wall HVAC Units in SRA
Rehabilitation of Canal Culvert at Station 2550+90 (1 mile upstream of 10-mile)
Rehabilitation of Traprock Spillway
<b>LOW PRIORITY</b>
Dredging of Canal Between Landing Lane and Route 18 - Engineering
Dredging of Canal Between Lambertville and Route 1
Dredging of Canal Between Amwell Road and 10 Mile
Clearing Spruce Run Spillway
Construction Bedload Stone Trap @ Wickecheoke Creek
Cutoff Wall in Shipetaukin Creek Guard Bank
Wickecheoke Creek Gates Abandonment
Rehabilitation of Waste Gate downstream of 10 Mile - Woodwork on Façade
Rebuild Stone Embankment at the 10 Mile Waste Gate
Rehabilitation 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
Rehabilitation of Spillway upstream of Griggstown Lock
Rehabilitation of the Four Mile Spillway
Pipeline Evaluation - Whitehouse Release Pipeline
Pipeline Evaluation - RV Force Main

**Dredging between Kingston and Amwell Road – Design Engineering**  
**Dredging between Kingston and Amwell Road – Rt 202 Stockpile Site**  
**Dredging between Kingston and Amwell Road – Construction Engineering (bond)**  
**Dredging between Kingston and Amwell Road – Construction \$35M (bond)**

Flow in the 10.5-mile reach of the Canal between Lincoln Highway (Route 27 just east of Kingston) and Amwell Road in Franklin Township, Somerset County is being hindered by accumulated sediment. The flow restriction is aggravated by weed growth during the summer months. To compensate for these flow restrictions, the Canal is operated at a level that is higher than desirable and causes water to overtop normally dry spillways. Five major water purveyors divert water from the Canal, downstream of this area, including North Brunswick Township, New Jersey American Water, Middlesex Water Company, East Brunswick Township and the City of New Brunswick.

Staff took cross-sectional measurements in this reach during 2007 and 2008 to estimate the quantity of accumulated sediment. Analysis of the cross-sections indicated that an estimated 248,000 cubic yards of sediment have accumulated in the Canal and must be removed and properly disposed.

Additionally, the US Route 202 sediment stockpile site in Delaware Township, Hunterdon County (just north of Lambertville) is reaching capacity. Removal and disposal of up to 47,000 cubic yards of sediment, that has previously been dredged as part of the Authority's maintenance dredging program, from this site is included as part of the proposed dredging project.

Professional engineering consultant Urban Dredging Consultants Joint Venture (Urban Dredging) was selected to plan the dredging program including development and execution of a proactive public participation program. A bathymetric survey was conducted and confirmed the quantity of sediment to be removed. Sediment cores were taken to determine the characterization of the material to be removed.

Urban Dredging considered the following four methodologies for the proposed dredging project: mechanical excavation (in dry), mechanical dredging (in wet), hydraulic dredging with Geobags, and hydraulic dredging with mechanical dewatering. All four considered methodologies have environmental concerns but hydraulic dredging methodologies reduce many of these concerns since the slurry would be conveyed in a pipe floating in the Canal to a temporary staging area for dewatering.

An Environmental Impact Assessment and the necessary public information meetings were held between 2010 and 2013. Five access points and the staging area are being targeted and the completion of the design documents is over complete with some very minor details outstanding. The determination of the disposal site (final destination) of the dredged material is near complete.

Removal of sediment from this reach is planned for FY 2018 - 2020. The application for funding through the New Jersey Environmental Infrastructure Trust (NJEIT) will be resubmitted and formulated to cover the full estimated construction cost of the dredging and other allowable

expenses, currently estimated at \$52,000,000.00. The costs shown in the CIP includes design and cultural resource service costs incurred before the loan is authorized. The Authority is also soliciting a preliminary cost proposal from Urban Dredging for full-time inspection and construction management (for the first year of dredging), which can also be bonded with the Construction cost.

Removal and disposal of up to 47,000 cubic yards of sediment from the US Route 202 stockpile site cannot be funded through the NJEIT and is included in this CIP. The estimated cost for removal and disposal of this sediment is \$1,500,000.00.

### **Rehabilitation of the 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 of the Delaware River, the embankment is threatened by the elevated floodwaters from the river. It was overtopped during 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, over 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. This slide compromised the cross-sectional area of the embankment, drastically 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 repair / reinforcement work on the embankment may be required to reinforce the repairs. The embankment is susceptible to slope failure from saturation and/or erosion from overtopping during major flooding events, which may result in breaches of the Canal. The embankment may need improvements to increase the factor of safety for resisting slope failure and through seepage when the river is approaching the top of the embankment, or the threat of overtopping the entire embankment causing erosion.

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. To date, borings were taken through the embankment and preliminary meetings were held with the permitting agencies. The Authority is reviewing a Schematic Design Report from the consultant. At this time, an estimated construction cost of \$3.75M is included in the CIP. The work is currently projected to occur in FY 2019.

### **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 to act as 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 aqueduct is a concrete and masonry structure that was partially rehabilitated in 1989. The 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 structure 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 resulting from 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 significantly during construction due to dewatering issues and safety concerns. The corrugated metal liner in the north culvert showed signs of being corroded and limited the amount of work which could be conducted in the culvert.

A Scope of Services will be developed to retain a new 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 reinforcing which will not significantly reduce the flow rate capacities of the culverts.

**Round Valley Reservoir Dams-Rehabilitation & Resource Preservation Project**  
**(Preliminary Engineering and Owner's Engineer Preconstruction)**  
**Design Improvements to RV Dams - Engineer of Record – Design Engineering Only**  
**Round Valley Dam Improvements - Construction \$60M (bond)**  
**Construction Engineering Management for RV Dam Improvements (Bond Est \$5M)**  
**Owner's Engineer - Construction of RV Dam Improvements During Construction**

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 1960's. 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 existing contract with Gannett Fleming, the engineering consultant, 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 the TRB in their analysis of all available data pertaining to the construction and maintenance of the embankments. The 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 their report on the PFMA, the TRB recommended that the Authority “begin budgeting, engineering, and planning for the required modifications.”

At a minimum, it is anticipated that construction will be large in scale and include the following:

- 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. The new blanket drains will act to filter the existing seepage.
- Installation of new toe drains to filter, collect, and convey embankment and foundation seepage safely away from the structures.
- Installation of additional fill to flatten the downstream slopes to increase the stability factor of safety.

Schnabel Engineering has been 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 (GF) has been procured to provide further engineering and consulting services during design and construction of the Round Valley Dam rehabilitation. The Authority will utilize GF in the role of Owner’s Engineer during the design and construction of the project. While Schnabel Engineering will act as the Engineer of Record, GF will continue to provide advice and consultation to Authority staff during this very important project.

The Engineer of Record, Schnabel Engineering, who is working on the above noted scope items has also been procured and is under contract to investigate and perform the following tasks:

- Rehabilitate the hydraulic valve on the Round Valley South Dam (detailed below)
- Remove and replace 10-inch Cast Iron Pipe that connects the RV Force Main to the RV South Vault (detailed below)
- Dredging of the Round Valley South Tower Intake Channel (detailed below)
- Repairs to the Round Valley building structures (Towers and vaults, detailed below)
- Security improvements at RV Reservoir (detailed below)



It is noted that, with the exception of the security improvements which will be financed from the CIP, long-term funding is being sought from the New Jersey Environmental Infrastructure Financing Program (bonded). The project is intended to be phased with the abutment grouting, intake channel dredging, and security improvements to be implemented prior to the large scale work on the embankments which will incorporate all of the remaining noted scope items.

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

The existing Round Valley (RV) low-level release valve was last serviced 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 existing hydraulic lines are showing signs of leakage while under operating pressures, and must be replaced if the leak cannot be pinpointed.

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 replacement of this hydraulic line to the underwater actuator must be done with commercial divers due to the extreme depths. The entire system will be analyzed to determine if any additional repairs are required. The engineering review will also consider the complete abandonment of the low-level release which would likely entail filling of the pipeline with grout. It is anticipated that this work will be paid for through the above noted bonding associated with the large Round Valley project. For this reason funding is not included in the CIP budget.

### **Rehabilitation of 10-inch Cast Iron Pipe Connect RV-S Dam Vault to Forcemain**

The existing 10-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 10-inch cast iron pipe, likely adjacent to the vault. This pipe is installed underground with flanged connections which are prone to leak in buried applications. It must be determined if the best course of action will be to line the pipe with a cast iron pipe lining material or to replace it 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. It is anticipated that this work will be paid for through the above noted bonding associated with the large Round Valley project. For this reason funding is not included in the CIP budget.

### **Dredging of the Round Valley South Dam Intake Channel**

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 the years of pumping, the constructed channel has been filled with sediment. As part of the large-scale Round Valley Rehabilitation & Resource Preservation Project, the consultants were asked to design the effort necessary to remove the significant 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. It is anticipated that this work will be paid for through the bonding associated with the large Round Valley project. For this reason funding is not included in the CIP budget.

The Engineer of Record has already started its investigation which includes survey and sediment sampling efforts and a basis of design report has already been submitted. It is anticipated that the South Dam Intake Tower Dredging project will take place in FY 2018.

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

The building structures (buildings and vaults) at the Round Valley Reservoirs 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 in the reservoirs.

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. It is anticipated that this work will be paid for through the bonding associated with the large Round Valley project. For this reason funding is not included in the CIP budget.

The engineer has already made inspections including underwater portions of the two towers in the Round Valley Reservoir. The proposed work is expected, at a minimum, to include repairs to the roof and the sluice gates on the towers.

### **Security Improvements at RV Reservoir**

The NJDEP Dam Safety section has requested the Authority make improvements in security at the Round Valley dams and dike. Staff has identified improvements on existing and 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. It is anticipated that this work will be paid for from the CIP budget and be completed in FY 18.

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

Additional security improvements are always being considered for the RV and SR embankments. 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 completed in sequences over the next four years.

### **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 shows 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. It is uncertain how accurate this modeling would be in the event of an actual emergency.

Authority staff feels 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.

Authority staff has been researching computer program options and deliverables, and planning the anticipated scope of work to potentially procure a consulting engineering firm to construct this inundation mapping model. It is noted that recent developments in publicly available software may allow the Authority to perform the inundation modeling "in-house."

### **Rehabilitation of the Ten-Mile Waste Gate**

The Ten-Mile Waste Gate is located just upcanal of the Ten Mile Lock. It is a concrete structure with two sluice gates that are routinely opened and closed to adjust discharge flow from the Canal to the Millstone River near its confluence with the Raritan River. Canal flow in excess of that required by downcanal water purveyors is used to augment flow in the Raritan River and to control levels in the Canal. The existing waste gates were installed in 1958 and are in need of replacement. One of the two gates is inoperable and the second gate is difficult to operate. Construction plans and specifications to replace the existing gates were prepared by Authority staff. A contract has been executed and construction is expected to take place in FY18.

### **Dredging of Intake Pond and replacement of ice deflectors at the South Branch Pumping Station**

The intake pond at the South Branch Pumping Station (SBPS) was designed with a capacity of 21,000,000 gallons during low flow pumping periods. Sediment has accumulated in the pond reducing its capacity, thereby reducing the efficiency of the pumping operation. Sediment was last removed from the pond in 1986 when it was removed in the dry and stockpiled in a temporary site adjacent to the pond. The material has been dispersed through the years by maintenance as needed throughout Authority properties.

Also at the SBPS, there are twelve steel wide flange beams set in a concrete bed that function as an ice deflector at the release works of the channel of the South Branch Raritan River adjacent to the pond. The ice deflectors protect the structure from damage from ice and trees floating down

the river. They are deteriorating and need to be replaced. The ice deflectors are intended to be repaired as part of the pond dredging project.

Authority staff has procured the services of a consultant to provide professional engineering services to prepare designs for dredging of the pond and replacement of the ice deflectors. The consultant has drafted a schematic design report that recommends that the pond be mechanically dredged in the dry. Construction is anticipated to take place in FY18 – FY19.

### **Griggstown Waste Gate and Embankment Seepage Repair Station 2083+40**

The Griggstown Waste Gate is located on the Canal left bank, approximately 160-foot upcanal from the Griggstown Lock in Franklin Township. The waste gate system consists of a concrete headwall on the Canal side housing a 36-inch wide x 48-inch high manually operated cast iron sluice gate. The sluice gate connects to a 6-foot diameter reinforced concrete pipe extending beneath the multi-use trail. The outlet pipe (river side of embankment) is held by a stone masonry headwall and wingwalls. The sluice gate discharges to the Millstone River. The structure was last rehabilitated in 1991.

In January 2017, during the recurrent inspection of the Delaware and Raritan Canal appurtenant structures, the inspection team found steady seepage coming from near the bottom of the downstream stone masonry headwall. Physical indications of a possible structural issue, such as sinking in the multi-use trail and settlement/deflection of the nearby wood guard rail fencing were also noticed.

The presence of the visible seepage in conjunction with the sinkhole lead staff to be concerned that there is an ongoing internal erosion condition. It is believed the structural deficiencies are leading to the internal erosion of soil particles within the embankment. Currently the seepage appears clear and is monitored regularly.

An engineering consultant has been procured to design a repair for the structure. The consultant must provide a design that considers the high historic sensitivity of the structure. Schematic design is complete and following receipt of all permits, construction bids will be advertised. The consultant has recommended cementitious grouting of the embankment between the headwall structures. It is anticipated that all construction will be completed in FY-18.

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

The Six-Mile Run Culvert is a historic 3-barrel 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.

Recent inspection of the structure has identified dislodged stones on the upstream side of the culvert located directly beneath Canal Road. Recent repairs to the blacktop suggest the movement of soils above the stone arches that form the culverts. It is noted that the County of Somerset maintains the road above the culvert.

Engineering services will be procured to clean and inspect the culverts and to design repairs to the stonework inside the culverts. Further, the collapsed stone façade on the downstream headwall will be replaced. Engineering services will be procured in FY18 with construction to follow.

### **West Amwell Seepage Repair at Masonry Wall at Station 411+37**

There is a stone gravity retaining wall located on the right bank of the Delaware and Raritan Canal (multi-use trail) located approximately 0.6 miles down canal from the Lambertville Lock in West Amwell Township. The gravity wall was constructed of dry laid stone and runs for several hundred feet along the Canal. The wall retains the embankment that separates the Canal from the Delaware River and appears to be original to the Canal's construction.

In February 2017 Canal maintenance staff reported seepage through the stone retaining wall at Station 411+37. Engineering staff inspected the area and confirmed that a length of approximately 30 feet of the wall was leaking at the toe. Further investigations identified two more sources of seepage 15 to 20 feet distant from the toe towards the river. The latter finding increased the overall length (along the Canal) of identified seepage to approximately 100 feet. The seepage was clear at the time of the inspection and there was no evidence of settlement or embankment movement along the affected area. It was confirmed that the same area has been observed wet in years past. Furthermore, Canal staff had no recollection of previous settlement or embankment movement at that location.

In early March, a sinkhole was found to have developed on the Canal right bank at the same Canal station of the seepage location. The sinkhole represented a significant changed condition. Therefore, it was decided to proceed with procurement on an emergency basis which allowed for an accelerated procurement, design, and repair.

An engineering consultant was procured on an emergency basis and plans and specifications for repair were produced quickly. The engineering consultant proposed chemical grout to eliminate the seepage through the wall. Chemical grout was installed through "injection rods" and by use of a pump which mixes and inserts the grout into the subsurface. The chemical grout was used to fill the voids in soil behind the wall to eliminate the seepage. Construction took place during June 2017 and was completed in three (3) weeks with satisfactory results. Two different types of chemical grout were used, Acrylate and a water reacting polyurethane. The work was completed in FY17, but it remains in the CIP because the construction contract will not be paid until FY18.

## **Replace Fuel System Pumps and Software/Inventory System at Spruce Run Administration Building**

The Spruce Run fuel facility was installed in 1991 which included one 5,000-gallon UST for unleaded gasoline, one 2,000-gallon UST for diesel fuel, a fuel dispensing island with computerized pumps, a canopy for weather and stormwater runoff protection, associated piping and electrical wiring, leak detection, overfill protection, spill prevention, and corrosion protection for both tanks and piping.

The system has performed adequately but a recent inspection revealed that the dispenser frames, supplementary connection piping, containment chambers, junction boxes and the fuel island steel curb forms are rusted and have lost much of their structural integrity. The dispensing units are in poor condition and are discontinued from the current market. The fuel storage and management system requires an upgrade to match newly installed fuel systems at the Canal Field Office in West Trenton and the Manasquan Water Supply System Office in Wall Township. It is also noted that parts for both the dispensing units and the fuel storage and management system are very difficult to locate. It is noted that double-wall underground storage tanks are reported in good condition.

Engineering services will be procured to inspect, investigate and design a new fuel dispensing system including replacement of vapor vent and vapor recovery piping, conduit and junction boxes, signal, communication and power wires, pipe containment chambers, penetration boots, replacement of dispensers, card readers system, expansion of the Veeder-Root system to fuel-oil and waste tanks, installation of fuel recovery pipe dispenser sumps, replacement of the fuel island and the existing canopy. The engineering services are planned for FY18 with construction to follow.

## **Replace Office Telephone System Spruce Run Authority Wide**

The Authority telephone phone system was purchased in 2007 with a serviceable life expectancy of 10 years, based on history, manufacturer's and installer's recommendations. In 2013, the Clinton Administration Building 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 experience additional capabilities such as:

- voicemail to email
- extension dialing between Authority locations
- teleconferencing within the system and dedicated teleconference units for each location that will be standardized
- 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. The capability may exist to combine the Administration Building and Watershed Building to one system. Estimated cost is \$60,000 - \$80,000, depending on configurations and can be purchased under State Contract. Phone system replacement is anticipated for FY18.

### **Canal Seepage Repairs - Blackwells Mills at Station 2334+67**

In March 2017 a member of the public reported seepage through the toe of the earthen embankment between the Canal and the Millstone River that was seeping towards the river. The seepage was occurring approximately one half mile down canal from Blackwells Mills Road in Franklin Township. Canal maintenance staff confirmed its presence, and the Chief Engineer with two outside geotechnical consultants immediately inspected the embankment. It was agreed that the seep was controllable but that the embankment should be repaired in short order. Further investigations yielded up to five seeps spread out along approximately 170 linear feet of the embankment. At the time of inspection the seepage was clear and there were no signs of soil particles in the seepage (piping). Piping can lead to embankment breach if not rectified. Short-term interim risk reduction measures were implemented by Authority Staff, including the installation of sand filters and regular monitoring.

An engineering consultant was procured on an emergency basis to design a repair. The consultant performed geotechnical borings and their schematic design proposed the installation of steel sheeting through the center of the embankment (towpath) to competent rock. A contractor was procured who installed the sheeting that stopped the seepage in August 2017.

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

Four major flood events in the Delaware River have overtopped the Canal embankment between the Raven Rock Lock and Prallsville Lock since September 2004. The Canal embankment in this stretch that separates the Canal from the River is very narrow and is inaccessible by vehicle. It is necessary to maintain the embankment by boat, which is challenging. During large flood events, the Canal and the Delaware River water levels are elevated above the embankment and become one body of water. There are several areas in this stretch that experienced heavy deterioration during these events, typically initiated by fallen trees.

The Canal embankment experienced significant deterioration following the major river flooding following Tropical Storms Irene and Lee in 2011. The Authority had to implement emergency measures to prevent further erosion of the embankment. 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.

A regular procurement process was commenced to repair this section of the embankment for an engineering consultant and a cultural resources consultant. A professional services contract was awarded to a team led by GZA GeoEnvironmental as the engineers 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 require 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 seventeen additional areas that warrant attention. Conceptual approval has been received from the State Historic Preservation Office and the Delaware and Raritan Canal Commission.

GZA's preliminary conceptual construction cost estimate for the eight primary damaged embankment repairs is approximately \$2.52 million, however, the budget has been increased due to the expectation that new repair areas will need to be addressed based on recent inspections. Staff will need to prioritize repairs of the eight originally noted sites and the 17 additional areas. Construction of this project is anticipated to take place over several years due to access, environmental, and wildlife constraints.

### **Rehabilitation of Canal Flow Structures at the Griggstown and Ten Mile Locks**

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. 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.

In addition to the replacement of the flow control gates, there are a variety of repairs needed at each of the sites. The deficiencies range from minor cracking and spalling of the concrete to repair of structural undermining of the locks.

The Authority plans to phase in gate replacement and structural rehabilitation based on operational priorities.

### **Refurbishment of Main Pumps and Motors No. 4, 5, 7, & 8**

The South Branch Pumping Station (SBPS) was constructed in the 1960's to pump water into Round Valley Reservoir. The main pumps, motors, and associated equipment at the station are infrequently operated. Maintenance pumping is done periodically to maintain the equipment. As the demand on Round Valley Reservoir increases, so will the need to pump water through the station. The Round Valley Reservoir Dam Rehabilitation and Preservation project may create a period of sustained drawdown of Round Valley, which will create a future demand to reliably refill the reservoir.

The Authority retained Hatch Mott MacDonald (HMM) to prepare an asset management plan for the SBPS and prepare specifications for the refurbishment of the pump units. All ten pumps



have similar baseplate and alignment problems, but only two (pump assemblies 1 & 6) of the ten were refurbished under the recent contract.

There will be a need for a significant pumping program within the next few years. The Authority has targeted the need to rehabilitate four more pumps, specifically pump assemblies 4, 5, 7, and 8. Lessons learned from the rehabilitation of pumps 1 & 6 will be used to formulate the efforts in rehabilitating the next four pumps.

### **Removal of Sediment from Route 1 Conduit**

The U.S. Route 1 Conduit is a twin-barrel, 13' x 8' concrete box culvert constructed in the 1950s. It is approximately 6,050 feet long and carries the Canal water under U.S. Route 1 from Southard Street to the north of Mulberry Street, in the City of Trenton, Mercer County. This section of roadway is locally named the "Trenton Freeway."

In addition to carrying the Canal water, this conduit serves as the storm drainage outlet for the highway directly above the 300 +/- acre area immediately west of the conduit in the City of Trenton. As a result of highway storm drains and local storm drainage pipes discharging into the westerly barrel of this enclosed section of the Canal, sediment accumulates in the conduit and interferes with its flow carrying capacity. This is a recurring problem necessitating removal of the sediment. Approximately 6,000 cubic yards of sediment was last removed from the west barrel in the 1980's.

Currently, the flow carrying capacity of the conduit is again being impacted by accumulated sediment. In a meeting in early 2016, NJDOT accepted responsibility for this project and is preparing plans and specifications to have the sediment removed. A small amount has been left in the Capital Improvement Plan in case the NJDOT requires assistance from the Authority.

### **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 historical appearance. The spillway was finished with hand-placed stones across the crest and the river side slope. The stones were laid in a sand bed without the benefit of mortar. The spillway is deteriorating. The stones are being dislodged and the spillway crest needs to be stabilized. The planned rehabilitation is expected to consider removal of all stones from the crest and installing a concrete slab as a substructure to the stones that would be reset.

A narrow embankment separates the Canal from the Raritan River just downstream of the Island Farm Weir on the Raritan. The river side slope just downstream has experienced significant erosion and is in need of rehabilitation. Continued erosion and deterioration could lead to a breach of the Canal.

Authority staff is soliciting the services of an engineering consultant to design repairs to the spillway and the embankment as part of one construction project.

### **Rehabilitation of the Spruce Run Weir**

The Spruce Run Weir is a reinforced concrete structure that crosses the Spruce Run downstream of the Spruce Run Reservoir just upstream from its confluence with the South Branch of the Raritan River. The USGS gaging station on the west bank of Spruce Run 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 spillway over the past decade. The concrete structure is severely degraded; however, with large amounts of exposed reinforcing steel and visible through seepage suggesting that the structure has clearly met the end of its useful life.

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

A sinkhole developed in the towpath 1,600 feet upcanal from Whitehead Road in Lawrence Township, Mercer County. This location is 3,600 feet downcanal of the outlet of the Trenton Conduit. The sinkhole developed as a result of a failed storm drainage pipe that goes under the Canal and U.S. Route 1 and discharges into the Assunpink Creek. The sinkhole caused erosion in the Canal slope and the Canal path. Staff filled the sinkhole with 6-inch riprap and regraded the area.

The pipe was not repaired and will necessitate additional planning and action. The initial step in repairing the pipe is the need to determine who is responsible for the pipe and assess the condition of the entire pipe length.

### **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 their 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 stopgap measure is working to eliminate the seepage. Experience from the earlier trials has shown that the seepage returns if the sandbags are removed or washed off and flow discharges from the northern most 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 Upgrades**

A vulnerability assessment of the Authority's facilities was completed in 2003. Buoys were installed around the tower at the Spruce Run Reservoir in 2015. Several security improvements have been included as part of the Round Valley Dam rehabilitation project identified above. Bids will be solicited to install security cameras around the Canal Field Office for installation in FY-18. Other protective measures continue to be considered as recommended in the vulnerability assessment.

## **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 1940's-era concrete aqueduct trunk.

The Aqueduct's circa-1834 historic 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.

It is noted that a new Canal leak was detected in May 2007 below the northeast abutment's masonry. Further investigation into the leak revealed that water was percolating between the joint of the concrete aqueduct northeast flap wall and the stone masonry abutment. A temporary repair was made at that time, but this erosive process could lead to a progressive failure of the stone masonry structure, as it has been observed for the southwest Canal embankment. The aqueduct's embankments are in fair condition with the exception of the southwest Canal embankment, which is leaking water from the Canal into the creek.

It is recommended to set up a corrective action on the new detected leak at the northeast end of the aqueduct.

## **Rehabilitation of Carnegie Lake Aqueduct**

The Carnegie Lake Aqueduct comprises of a concrete structure that crosses over the Millstone River at Station 1739+00 of the D & R Canal. Previous inspections indicated that the aqueduct structure was not structurally deficient, although minor cracking and concrete spalling at isolated locations was observed. It was not thought that these conditions would compromise the structure's integrity. A small leak was observed at the northerly wing-wall of the aqueduct near the lake's staff gauge.

In 2016 the Authority retained the services of a diving services contractor to analyze the condition of the structure. The result of the inspection did not reveal any items in urgent need of repair. It is anticipated that some relatively minor repairs will have to be made during the next few years.

### **Replace Fixed Cone Valves at Spruce Run Vault**

The Spruce Run Reservoir Vault is fitted with two 30-inch fixed cone valves that act 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. Even though the structure was reconstructed in 1982, the original valves that were installed in the early 1960's were relocated to their current position. Authority staff performs annual maintenance on the valves but the external corrosion present on the valves is making that more difficult with each year that passes. Recently, the valves had to be "coerced" to open because they were sticking.

The fixed cone valves are critical to the operation of the reservoir and are nearing the end of their useful life. Authority staff intends to procure the services of an engineer to investigate the vault and recommend the most appropriate replacement for the existing fixed cone valves.

### **Replacement of the through the wall HVAC units at the Administration Building**

The 26 through-the-wall HVAC units at the Administration Building are reaching the end of their useful life. They were installed in 1994. Replacement parts are becoming difficult to get and the units are constantly in need of service. Replacement of the units is currently being investigated by Authority staff.

### **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.

### **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 ¾ 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 1830's 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. Rehabilitation of the Trap Rock Spillway will be scheduled after the dredging program between the Kingston and Amwell Road.

### **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 is being developed for the Canal reach between Kingston and Amwell Road.

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

Sediment was removed from this reach in the mid-1980's. 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 1980's. 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 needs to focus on the removal of sediment from this reach.

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

Currently plans are being developed to dredge 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 needs to focus on the removal of sediment from this reach.

### **Clearing Spruce Run Spillway**

The Spruce Run Spillway was cut into the bedrock as part of the original Spruce Run Dam construction. The spillway was kept clean of vegetation for many years after the original dam construction as part of routine grounds clearing work. Many years ago, the Authority stopped removing all vegetation from the banks and within the spillway, instead opting for sporadic removals. Clearing of the spillway is important in order to allow adequate flow of water during significant spillway flows.

The complete clearing of the trees and shrubs from within and from the banks of the Spruce Run Spillway will seek to restore the spillway to its original layout and restore original design capacity. Clearing will also enable better observation of existing springs and seep locations located within the bedrock base of the spillway that may be related to performance of the dam.

### **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 1990's recommended the construction of 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 desires to pursue construction of the structure because of the escalating need to remove bedload from the Canal at this location and the difficulty of removing the material from the Canal at this location. However, this project is currently on hold and has been moved to low priority.

### **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 the 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 the 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 but most of the leakage occurs in a 3,200-foot long section between Station 1477+00 and Station 1509+00.

A cutoff wall is planned for construction in this reach of the embankment. The depth of the cutoff wall is expected to range between 8 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 for 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 to not operate these waste gates because they have been extensively damaged by wood debris that accumulates in this area during flooding. The gates will need to be abandoned in the future. Funding for this project is not included in this five year program.

### **Rehabilitation of the Waste Gate Downstream of Ten Mile Lock**

The waste gate 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 waste gate consists of a wooden gate structure set between guides attached to the recessed portion of a concrete inlet headwall. A 60-inch diameter concrete pipe links the gate and inlet headwall to the outlet headwall. The outlet headwall and wingwalls are constructed of stone masonry.

The outlet pipe was permanently sealed with concrete in 2014. Woodwork is planned for the waste gate façade. Funding for this project is not included in this five year program.

### **Rebuild Stone Embankment at the 10-Mile Waste Gate**

This project encompasses reconstruction of the deteriorated stonework on the downstream side of the structure. Funding for this project is not included in this five year program.

### **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 4 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 Bulls Island State Park in Delaware Township, Hunterdon County. The concrete lock structure consists of four metal sluice gates and operators. Adjacent and downcanal from the locks there is a stone 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 that it is 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, 63 feet long, 13 feet wide and 8 feet high, which runs beneath Weston Canal Road. The pipe abuts a 6-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, 5 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. 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 approximately 129 feet long, which appear to be founded on natural rock. The culverts convey Mile Run Creek under the Canal and discharge into the Raritan River in the City of New Brunswick. The barrels are approximately 12 feet wide and 6 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 comprised the restoration of 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 looks 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 Spillway Upstream of the Griggstown Lock**

The spillway upstream 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 1830's 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.

Rehabilitation of the spillway will be scheduled after the dredging program between Kingston and Amwell Road is complete so the reconstructed spillway does not get damaged by the heavy equipment used to haul the sediment from the site. 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.

Recent flooding events washed 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.

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

The Round Valley Release Pipeline (RVRP) conveys water from the Round Valley North Vault to the Whitehouse Release. The pipeline was also intended to convey water pumped from the planned Confluence Pumping Station back to the Reservoir. One pipe section of the 108-inch diameter prestressed concrete cylinder pipe ruptured in 1988 and numerous other sections were found to have 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 where there were faulty materials being manufactured in the industry, which have resulted in failures of similarly dated pipelines.

Funding for a more thorough evaluation by an outside consultant is not included in this five year program; however, the Authority continues to execute 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 5% 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 severely 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.

Additionally, the management plan developed in 2003 identified 4 other sections that warrant increased monitoring: pipe sections 33, 43, 48 and 617. The consultants recommended additional non-destructive testing of the entire length of the Force Main with particular emphasis on the noted sections. Continued monitoring of the Force Main is warranted before any additional pipe sections are excavated or replaced.

Funding for a more thorough evaluation by an outside consultant is not included in this five year program; however, the Authority continues to execute scheduled internal inspection 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, 2018**

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

7:11-2.3      General Rate Schedule for Operations and Maintenance

(a)      The General Rate Schedule for Operations and Maintenance per million gallons listed at (b) below is based on estimated annual operations and maintenance expense consisting of all current costs, obligations and expenses of, or arising in connection with, the operation, maintenance and administration of the System, and minor additions or improvements thereof or thereto, or the performance of any water purchase contract, including, but not limited to, all of the following:

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 182.353 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> (State Fiscal year or otherwise indicated)	<u>Allocation</u>	<u>Rate/Million Gallons</u>
State fiscal year [2018] <b>2019</b>	Million Gallons per Day (MGD)	194.00

7:11-2.4 Debt Service Assessments

(a) (No change.)

(b) The following Debt Service Assessment rate for the New Jersey Environmental Infrastructure Financing Program loans, based on a sales base of 182.353 million gallons per day will be applied to all customers.

<u>Period</u> (State Fiscal year or otherwise indicated)	<u>Allocation</u>	<u>Rate/Million Gallons</u>
State fiscal year [2018] <b>2019</b>	Million Gallons per Day (MGD)	\$85.00

7:11-2.5 Capital Fund Component

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

(c) Capital Fund Assessment

<u>Period</u> (State Fiscal Year or otherwise indicated)	<u>Allocation</u>	<u>Rate/Million Gallons</u>
State Fiscal Year [2018] <b>2019</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 or otherwise indicated)		
State Fiscal Year [2018] <b>2019</b>	Million Gallons per Day (MGD)	\$24.00

**APPENDICES**

**I. Report of CLA PC – Allocation of Headquarters General and Administrative Expenses – FY2019**

**II. Report of CLA PC – Allocation of Headquarters General and Administrative Expenses – Audited FY2017 Expenditures**