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 2020

ADJUSTMENT OF DEBT SERVICE ASSESSMENT AND SALES BASE FOR DEBT SERVICE PAYMENTS DUE AND REQUIRED FOR FISCAL YEAR 2020

ADJUSTMENT OF GENERAL RATE SCHEDULE FOR CAPITAL FUND COMPONENT FOR FISCAL YEAR 2020

ADJUSTMENT OF SOURCE WATER PROTECTION FUND COMPONENT FOR FISCAL YEAR 2020.

Proposed effective Date: July 1, 2019

Approved: 11/5/2018

NEW JERSEY WATER SUPPLY AUTHORITY
PROPOSED RATE ADJUSTMENTS FOR FISCAL YEAR 2020
RARITAN BASIN SYSTEM

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PART I - EXPLANATION OF PROPOSED REVISED RATE STRUCTURE

Overview of Rate Proposal for Fiscal Year 2020 (July 1, 2019 - June 30, 2020)

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, 2019.

Summary of Proposed Adjustments

Component	Current (FY2019) Rates Per MG 7/1/2018 - 6/30/2019	Proposed (FY2020) Rates Per MG 7/1/2019 - 6/30/2020
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, 2018 to cover the operating expenses of the System for FY2019. The FY2019 O&M sales base was 182.353 million gallons per day (mgd). The Authority anticipates the FY2020 O&M sales base to remain the same. The O&M Component is projected to remain the same for FY2020 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 FY2020 require that an O&M Component of $194.00 per million gallons be charged starting on July 1, 2019.

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 $890,290 in FY2019, and the amount available in FY2020 will increase to $968,180. Overdraft sales decreased from $190,292 in FY2019 to $171,179 in FY2020. An additional $762,000 in prior year positive budget variance is used in FY2020 to offset the O&M component. Without the use of any rate stabilization funds

in FY2020, the required O&M Component of the rate would be an additional $14.55 per million gallons, for a total of $208.55 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 FY2020. 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 refurbishment of 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 FY2020 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 FY2020.

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 FY2020.

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 11, 2019, 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 8, 2019 at the Authority's Administration Building, 1851 Highway 31, Clinton, New Jersey.

The New Jersey Register Comment Period is scheduled to close on March 8, 2019 and the public hearing record on the proposed rate adjustments is scheduled to close on March 18, 2019.

Final action on the rate adjustment is scheduled for the Authority's May 6, 2019 meeting. The FY2020 rate will take effect on July 1, 2019.

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 FY2018 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 FY2020 budget based on the FY2018 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 FY2020 Raritan Basin System Operating Expense Budget is decreasing by $26,943 from FY2019. The Total Budget Requirement, which is net of the allocation of appropriate Headquarters General and Administrative expenses to the Manasquan Water Supply System, and includes capital equipment and contribution to reserves, is $14,029,038. This is $112,457 more than the FY2019 budget of $13,916,581 and results from a decrease in Headquarters G&A charges to the Manasquan System. The Capital Equipment budget of $167,900 is $27,400 more than the FY2019 budget of $140,500. 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 FY2019 levels. There are no contributions scheduled for the Depreciation Reserve and the Self-Insurance Reserve in FY2020. 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 FY2020. All of these modifications result in a total FY2020 budget requirement of $14,029,038 which is an increase of .8 percent relative to FY2019. (Page 15)

Nine of the thirty-one FY2020 direct operating expense accounts are projected to increase, but only three accounts by $5,000 or more relative to FY2019. Twelve of the operating expense accounts are projected to decrease relative to FY2019. The most significant projected increases in the budget occur in Maintenance of Equipment and Printing and Office Supplies, while the most significant projected decreases in the budget occur in Protective Services and Data Processing. In Salary and Fringe, regular salary is increasing by $120,300; the pension payment is increasing by $18,000. Retiree health benefits are decreasing by $164,300 and assume 5 additional retirees between FY2019 and FY2020. Salaries and benefits constitute approximately 75.9 percent of the FY2020 operating budget, and are increasing approximately 2 percent relative to FY2019.

Salaries and Benefits

Authority employees within Communications Workers of America (CWA), International Brotherhood of Electrical Workers (IBEW) and International Federation of Professional Technical Engineers (IFPTE) are currently operating under a contract that expires June 30, 2019. The FY2020 budget assumes a 2.0% cost of living adjustment payable July 1, 2019. The IFPTE/AFL-CIO represents the Authority's Maintenance, Craft and Security Units and the CWA represents the Authority's Administrative and Clerical, Primary Level and Higher Level Supervisors Units. The IBEW represents several management employees.

The Authority did not include any cost of living adjustments in the FY2020 budget for management. The Authority is budgeting 54 percent of the Salary budget for fringe benefits in FY2020, exclusive of retiree medical.

The initial estimate from the State of New Jersey for pension expense payable on April 1, 2019 is not yet available. The Authority has included 32 percent growth in that expense item over actual FY2018. The average increase in actual payments to Treasury for pension contributions since FY2015 is 4.5 percent. 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 $6,524 from $236,946 to $243,470 in FY2020. 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. 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 FY2020 by $164,300. The Authority is budgeting five additional retirees in FY2020. The New Jersey State Health Benefits Commission projects a 0 percent premium increase in 2019 for early retiree medical and a 12.7 percent decrease for Medicare retirees. The Authority budgeted 0.0 percent and 0 percent increases for FY2019 and FY2020 respectively. The budget contains sufficient funds for 58 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 for FY2020 has decreased by $5,000, from $92,000 to $87,000, for electricity costs for the normal operation of the pumping station. 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 2018. Pumping is funded from the Pumping Reserve ($150,000 annual deposit).

Special and Professional Services

The Authority proposes to decrease this line item slightly, from $554,243 in FY2019 to $543,818 in FY2020. Pricing is forecasted to remain stable in most subcategories of this line item, which includes gauging station expenses for the United States Geological Survey, costs related 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 decrease from $98,000 to $93,500 and vehicular fuel is projected to remain the same at $159,000 in FY2020. The prices of fuel in FY2020 are budgeted at $2.25 per gallon for unleaded and $2.35 per gallon for diesel.

Insurance Program

The Authority is recommending a decrease in insurance expense for FY2020 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 $153,442 decrease in the insurance line item for FY2020 which is a 12 percent decrease versus budgeted FY2019.

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 FY2020 are $74,000 based upon current rates of 1.0 percent for short-term investments. This represents an increase of $34,400 from $39,600 in FY2019. (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 FY2020, the Authority will make no contribution to the Depreciation Reserve. The Depreciation Reserve is fully funded in FY2020 (Page 15) Interest earnings from long-term investment accounts are swept into Depreciation Reserve.

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 FY2020. 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. An interim loan for the project closed in February 2018, and the permanent financing is expected upon substantial project completion. 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 FY2020 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 FY2020, 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 FY2019, should be assessed for FY2020 to generate approximately $2,196,442. The Authority deems these revenues sufficient to meet its capital needs for FY2020 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 FY2021 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 FY2020.

Other Rule Amendments

There are no other rule amendments. The language supporting the overall proposal is contained beginning on page 61 of this document.

PART II – DETAILED SUPPORTING INFORMATION

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Table 1 - Summary Of Proposed Fiscal Year 2020 Adjustments Based On Present Usage

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

RATE COMPONENT	CURRENT	ORIGINAL PROPOSAL 11/05/18	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 2020

Effective Date	O&M Charge	1981 Bond Charge 7/1/86-10/30/06	1998 Bond Charge 8/1/98-11/1/13	NJEIFP Debt Component	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%
July 1, 2019	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, 2019

2018

SEPTEMBER	27	Advise Water Users of informal meeting.
NOVEMBER	2	Informal meeting with Water Users – 10:00 AM.
	5	Board reviews and approves proposed Rates.
DECEMBER	21	Mail Official Notice to water customers, Rate Payer Advocate, interested parties and advertise in newspapers.

2019

JANUARY	7	Publication in the New Jersey Register.
	11	Pre-Pubic Hearing – 10:00 AM (within 45 days of Official Notice). Deadline for responses to inquires received prior to pre-public hearing.
FEBRUARY	4	Deadline for receipt of comments to be addressed at Public Hearing (15 days after pre-public hearing).
	8	Public Hearing Meeting. (SR Administration Building) – 10:00 AM Deadline for responses to inquires received between pre-public and public hearing.
	25	Written responses to questions raised at Hearing (within 10 business days of the public hearing).
MARCH	8	NJ Register Comment Period Ends.
	18	Public Hearing record closes (25 business days after Public Hearing).
MAY	6	Board approval of FY2020 Rates (Budget approval option)
JUNE	3	Board approval of FY 2020 Budgets.
JULY	1	Effective date.

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Proposed

Fiscal Year 2020 Budget Summary
(7/1/19 - 6/30/20)

	ADOPTED F/Y19	PROPOSED F/Y20	
Proposed Operating Expense Budget (Schedule 1)	$ 14,238,081	$ 14,211,138	
Net Allocation of Headquarters General and Administrative Expenses to the Manasquan Water Supply System - (Schedule 5)	$ (772,000)	$ (660,000)	
Proposed Total Expense Budget	$ 13,466,081	$ 13,551,138	
Proposed Capital Equipment Budget (Schedule 6)	$ 140,500	$ 167,900	(1)
Total Operating Expense & Capital Equipment Budgets	$ 13,606,581	$ 13,719,038	
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	$ 13,916,581	$ 14,029,038	
MISCELLANEOUS REVENUES:			
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)	$ (39,600)	$ (74,000)	
	$ (91,800)	$ (126,200)	
OTHER AVAILABLE FUNDS:			
Funds Appropriated to Rate Stabilization Fund for use in F/Y2017 (Resolution #2294, dated 06/05/17)	$ -	$ -	
Unanticipated Revenue (Schedule 8)	$ (890,290)	$ (968,180)	
Total Other Available Funds	$ (890,290)	$ (968,180)	
Net Amount to be paid for O & M Component	$ 12,934,491	$ 12,934,658	

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 1 - Proposed Operating Expenses Budget – Fiscal Year 2020 Distributed by Cost Center

Fiscal Year 2020

CODE	ACCOUNT	OFFICE EXECUTIVE DIRECTOR	FINANCIAL MANAGEMENT & ACCOUNTING	WATERSHED PROTECTION PROGRAMS	OPERATIONS MAINTENANCE & ENGINEERING	PROPOSED BUDGET FOR FY20
5110	Regular Salaries & Wages	$130,000	$1,713,550	$623,200	$3,801,100	$6,267,850
5120	Overtime-Salaries & Wages	0	121,790	0	121,680	243,470
5130	New Positions-Salaries & Wages	0	0	0	0	0
5140	Seasonal Help-Salaries & Wages	0	0	0	0	0
5150	Fringe Benefits	46,600	857,400	234,600	2,245,300	3,383,900
5167	Retiree Health Benefits	43,700	235,700	34,000	562,200	875,600
5168	Workers Compensation (Self-Insured)	0	10,000	0	0	10,000
	Total Salary & Fringe Benefits	$220,300	$2,938,440	$891,800	$6,730,280	$10,780,820
5200	On-Site Residences	$0	$0	$0	$21,600	$21,600
5210	Heating Fuel	0	0	0	93,500	93,500
5220	Utilities -Electrical Service	0	0	0	102,900	102,900
5230	" -Gas Service & Water	0	0	0	4,800	4,800
5240	" -Propane	0	0	0	500	500
5250	Electricity for Pumping	0	0	0	87,000	87,000
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	23,000	23,000
5290	Maintenance Supplies	0	8,100	0	185,200	193,300
5300	Maint. Supplies - Vehicular Equipment	0	0	0	60,000	60,000
5310	Major Special Vehicle Service & Repair	0	0	0	80,000	80,000
5320	Agricultural Supplies	0	500	0	6,500	7,000
5330	Maintenance of Equipment	0	33,700	3,500	39,200	76,400
5340	Service & Maintenance Contracts	0	72,300	3,400	180,300	256,000
5350	Equipment Rental	0	24,850	0	32,700	57,550
5360	Household-Safety & Protective Supplies	100	27,400	0	10,200	37,700
5370	Uniforms	0	5,400	0	3,160	8,560
5380	Special & Professional Services	25,000	194,278	171,640	152,900	543,818
5390	Protective Services	0	1,173,000	0	0	1,173,000
5400	Telephone	0	83,000	0	2,400	85,400
5410	Postage & Freight	0	7,500	0	120	7,620
5420	Data Processing	0	27,420	0	0	27,420
5430	Printing & Office Supplies	1,500	74,350	9,000	8,200	93,050
5440	Scientific & Photographic	0	0	0	500	500
5450	Dues & Subscriptions	14,400	12,820	1,000	14,200	42,420
5460	Advertising	0	5,500	0	500	6,000
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	$2,051,648	$193,540	$1,142,130	$3,430,318
	GRAND TOTAL	$263,300	$4,990,088	$1,085,340	$7,872,410	**$14,211,138**

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 1A - Comparative Statement

Fiscal Year 2020

CODE	ACCOUNT		FY'16 ACTUAL	FY'17 ACTUAL	FY'18 ACTUAL	FY'19 ADOPTED	FY'20 PROPOSED
5110	Regular Salaries & Wages		$5,327,730	$5,413,220	$5,799,411	$6,147,550	$6,267,850
5120	Overtime-Salaries & Wages		193,406	265,792	244,222	236,946	243,470
5130	New positions-Salaries & Wages		0	150	0	0	0
5162	Retiree Unused Sick & Vacation		0	23,815	0	0	0
5150	Fringe Benefits		2,754,466	4,657,807	3,633,755	3,263,400	3,383,900
5167	Retiree Health Benefits		812,707	867,991	821,473	1,039,900	875,600
5168	Workers Comp. (Self Insured)		850	1,766	493	10,000	10,000
	Total Salary & Fringe		9,089,159	11,230,542	10,499,354	10,697,796	10,780,820
	Budget Salary & Fringe						
5200	Residences		$25,013	$24,679	$17,161	$23,600	$21,600
5210	Heating Fuel		31,683	57,211	67,502	98,000	93,500
5220	Utilities -Electrical Service		80,151	92,554	98,336	104,100	102,900
5230	-Gas Service		4,093	4,171	4,531	5,200	4,800
5240	-Propane		834	219	403	500	500
5250	Electricity for Pumping Station		134,865	492,775	328,769	92,000	87,000
5260	Fuel - Vehicular		78,973	95,995	116,756	159,000	159,000
5270	Oil & Grease		5,606	7,650	4,033	9,600	9,600
5280	Tires		16,712	10,908	16,056	21,000	23,000
5290	Maintenance Supplies		152,302	151,949	163,391	186,100	193,300
5300	Maint. Supplies - Vehicular		69,029	58,231	61,576	58,000	60,000
5310	Major Vehicle Service & Repair		70,229	57,628	47,127	85,000	80,000
5320	Agricultural Supplies		2,550	4,472	2,317	7,500	7,000
5330	Maintenance Equipment		34,487	31,169	37,388	43,400	76,400
5340	Serv. & Maintenance Contracts		217,681	205,526	228,974	251,720	256,000
5350	Equipment Rental		38,002	32,345	54,332	57,550	57,550
5360	Household - Safety Supplies		31,543	39,518	34,163	35,700	37,700
5370	Uniforms		6,362	3,667	3,213	8,620	8,560
5380	Special & Professional Services		493,339	453,825	506,542	554,243	543,818
5390	Protective Services		1,142,799	1,126,790	1,138,434	1,326,442	1,173,000
5400	Telephone		81,248	82,167	78,449	85,400	85,400
5410	Postage & Freight Out		6,893	5,794	5,718	7,680	7,620
5420	Data Processing		36,336	34,933	35,453	39,000	27,420
5430	Printing & Office Supplies		42,595	31,846	41,272	63,450	93,050
5440	Scientific & Photographic		478	236	1,174	500	500
5450	Dues & Subscriptions		35,063	30,964	35,117	39,800	42,420
5460	Advertising & Promotional		5,746	23,078	5,219	4,500	6,000
5470	Travel & Subsistence		4,695	5,353	3,841	6,580	6,580
5480	Staff Training & Tuition Aid		9,507	19,111	12,460	23,550	23,550
5490	Fees & Permits		123,539	114,584	111,609	123,850	123,850
5500	In - Lieu Taxes		18,689	18,689	18,689	18,700	18,700
	Total Other Expenses		$3,001,045	$3,318,038	$3,280,008	$3,540,285	$3,430,318
	Total Operating Expenses		$12,090,204	$14,548,580	$13,779,362	$14,238,081	$14,211,138
	Annual Increase (Decrease)		2.86%	20.33%	-5.29%	3.33%	-0.19%
	Budget -other expenses		3,365,700	3,187,689	3,411,337	3,540,285	3,540,285
	ANNUAL BUDGET		$13,157,000	$13,491,339	$13,890,887	$14,238,081	$14,211,138

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

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

Fiscal Year 2020

		ADOPTED F/Y19	PROPOSED F/Y20
1.	Postage/Fax/ Misc. Machines (Dept. 16)	$ 1,500	$ 1,500
2.	IHS-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)	4,800	8,000
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)	3,500	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)	500	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	3,300
32.	Trimble Catalyst for GPS (Dept. 30)	-	500
33.	Refuse Collection (Dept. 31)	11,900	11,900
34.	Janitorial Service (Dept. 31)	15,500	15,500
35.	HVAC Service (Dept. 31)	5,500	5,500
36.	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 2020

		ADOPTED F/Y19	PROPOSED F/Y20
37.	Instrumentation Services (Dept. 31)	$ 4,500	$ 4,500
38.	Entry Rugs (Dept. 31)	5,000	5,000
39.	Carpet Cleaning (Dept. 31)	8,000	8,000
40.	Generator Service-Administration Building (Dept. 31)	1,200	1,200
41.	Underground Plant Location Service Notifications (Dept. 31)	1,500	1,500
42.	Crane Service and Inspection (Dept. 31)	2,200	2,200
43.	Elevator Service-SBPS (Dept. 31)	2,800	2,800
44.	Electrical Service-SBPS (Dept. 31)	20,000	20,000
45.	Miscellaneous (Dept. 31)	6,900	6,900
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)	42,000	42,000
49.	UST Service (Dept. 32)	2,500	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)	8,000	8,000
53.	Boiler Service (Dept. 32)	500	500
54.	Wood Disposal Fees (Dept. 32)	3,600	3,600
55.	Generator Service-Scudders & Perdicaris (Dept. 32)	3,000	3,000
56.	Johnny on the Spot - Rt. 202 (Dept. 32)	2,400	2,400
57.	Welco Gas (Dept. 33)	1,000	1,000
58.	Parts Washer & Hazardous Removal (Dept. 34)	1,000	1,000
59.	Boom Lift Annual Inspection (Dept. 34)	900	900
60.	Recycle Used Vehicle Fluids (Dept. 35)	500	1,500
61.	Fire Extinguisher Maintenance (Dept. 36)	9,000	9,000
62.	Hazardous Waste Control (Dept. 36)	1,500	1,500
63.	Fire Alarm Testing (Dept. 36)	8,000	8,000
64.	Vehicle Lifts Annual Testing (Dept. 36)	1,500	1,500
65.	Delaware Electric Cellular Service (Dept. 37)	600	600
66.	Dial My Calls (Dept. 37)	1,000	1,200
67.	Geomoto GPS Tracking (Dept. 37)	-	1,200
68.	Covert Wireless (Dept. 37)	-	180
69.	Miscellaneous (Dept. 37)	2,000	-
	TOTAL	$ 251,720	$ 256,000

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 3 - List of Category 5380 Items Recommended Professional Services

Fiscal Year 2020

		ADOPTED F/Y19	PROPOSED F/Y20
1.	Services-Governor's Authorities Unit (Dept. 10)	$ 25,000	$ 25,000
2.	Consultant-C.P.A. to Conduct Annual Audit (Dept. 13)	54,632	55,000
3.	Services-GFOA Certificate Fee (Dept. 13)	500	-
4.	125 Plan-Family security Insurance Agency (Dept. 13)	2,496	2,730
5.	Archiving (Dept. 13)	6,000	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)	43,500	40,000
11.	Insurance Broker-HRH (Dept. 15)	45,000	42,000
12.	GL Administrator (ESIS) (Dept. 15)	1,000	2,000
13.	Services-Attorney General's Office - Assistance of Deputy Attorney General concerning a wide range of legal matters (Dept. 15)	40,000	20,000
14.	MP Water Monitoring Costs - USGS SR @ Glen Gardner (Dept. 20)	9,560	9,860
15.	MP Water Monitoring Costs - USGS SB Raritan @ Stanton (Dept. 20)	7,920	8,400
16.	MP Water Monitoring Costs - USGS Landing Lane (Dept. 20)	34,804	35,700
17.	MP Water Monitoring Costs - USGS Raritan River @ Manville (Dept. 20)	45,958	47,000
18.	Continuous Record Gaging - USGS @ Washington Crossing (Dept. 20)	-	21,650
19.	Water Quality Monitoring - USGS @ Washington Crossing (Dept. 20)	-	4,960
20.	Water Monitoring Costs ASWQMN- USGS D&R Canal @ Landing Lane (Dept. 20)	7,500	13,350
21.	Water Monitoring Costs ASWQMN - NJDEP Mulhockaway @ Van Syckel (Dept. 20)	7,500	7,320
22.	Additional Flow Measure at SR, Stanton, Manville & Calco Dam (Dept. 20)	6,425	8,500
23.	Water Monitoring-SBWA/URWA now RHA (Dept. 20)	2,000	2,000
24.	Water Monitoring-SBMWA (Dept. 20)	1,500	1,500

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NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 3 (Cont.) - List of Category 5380 Items Recommended Professional Services
Fiscal Year 2020

		ADOPTED F/Y19	PROPOSED F/Y20
25.	Dash for the Trash (Dept. 20)	$ 1,000	$ -
26.	Lab Certification WPU/Water Sample Analysis (Dept. 20)	1,500	1,500
27.	NJ Invasive Species Strike Team (Dept. 20)	300	300
28.	Lockatong ISCO Monitoring (Dept. 20)	5,600	5,600
29.	D&R Canal ISCO Monitoring (Dept. 20)	1,300	4,000
30.	Cedar Grove Brook ISCO Monitoring (Dept. 20)	2,600	-
31.	Services-Emergency Engineering Services (Dept 30)	2,500	2,500
32.	Underground Storage Tank-CEA Report (Dept. 30)	11,000	11,000
33.	Underground Storage Tank Groundwater Test (Dept. 30)	2,500	2,500
34.	USGS Cooperative Agreement River Gaging - Maintenance of Raritan Basin Stream Gaging Stations and the Delaware & Raritan Canal Gauging at Kingston per USGS/DWR/NJWSA Agreement (Dept. 31)	68,000	68,000
35.	USGS Spruce Run Gage at Glen Gardner (Dept. 31)	17,000	10,200
36.	USGS Clinton Rain Gage (Dept. 31)	-	3,200
37.	USGS Washington Crossing Rain Gage (Dept. 31)	-	3,200
38.	Water Testing and Sampling to comply with the Safe Water Drinking Act (Dept. 31)	2,400	2,400
39.	Water Sampling and Testing as per NJDWR Requirements - RT 202 Stockpile Site (Dept 32)	6,000	20,000
40.	Maintenance of USGS Gauges at Washington Crossing and 10-mile and others (Dept. 32)	60,500	24,900
41.	Vac Truck Service - IFW, 10 Mile PS (Dept. 32)	4,200	5,000
42.	Safety Suggestion Program, Poster and Promotional Materials, Safety Incentive Program (Dept. 36)	9,700	9,700
43.	Pulmonary Testing and Physicals (Dept. 36)	5,000	5,000
44.	Annual Contributions to Fire Companies and Rescue Squads (Dept. 36)	500	500
45.	Hepatitis Vaccinations (Dept. 36)	800	800
46.	Calibration for the Pota-Count Respirator (Dept. 36)	900	900
	TOTAL	$ 554,243	$ 543,818

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 4 - Projected FY 2020 New Jersey Water Supply Authority Insurance Program

Policy	Raritan Basin System	Manasquan Reservoir System	Manasquan Water Treatment Plant and Transmission System	Total Premium
Property Limit $150 million, Limit $25m BI Deduct: $100k all perils $250k Deduct dams, dikes / $1m Deduct Canal flood	$521,658	$173,719	$44,623	$740,000
General/Products Liability Limit $1 million Deduct: $150k	$102,350	$8,625	$4,025	$115,000
Environmental Impairment Liability Limit $10 million Deduct: $100k	$22,250	$1,875	$875	$25,000
Workers' Compensation Limit $1 million	$186,027	$23,915	$25,058	$235,000
Employer Liability Limit $1 million	Included in Workers' Comp	Included in Workers' Comp	Included in Workers' Comp	Included in Workers' Comp
Umbrella Liability Limit $23 million	$267,000	$22,500	$10,500	$300,000
Business Automobile Limit: $1 million G/L, $0 pd Deduct: $50k, G/L	$22,985	$4,091	$924	$28,000
Management Liability				
Public Officials Liability	$44,500	$3,750	$1,750	$50,000
Cyber Risk	$5,340	$450	$210	$6,000
Fidelity & Crime			$4,000	$4,000
Limit $5 million/$1million/$1 million Deduct: $100k/$10k/$50k	$49,840	$4,200	$5,960	$60,000
Travel Accident Limit $2 million	$890	$75	$35	$1,000
TOTAL:	$1,173,000	$239,000	$92,000	$1,504,000

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 2020 (7/1/19-6/30/20)

	Total Headquarters Charge	Manasquan Reservoir System	Manasquan WTP/TS
Budgeted-Appendix I, amount to be charged to Manasquan System for FY20 (7/1/19-6/30/20)	$753,893	$649,479	$104,414
F/Y18 Adjustment as per audited Expenditures:			
Budgeted as per rate schedule for F/Y18 (7/1/17-6/30/18). Amounts paid during F/Y18 to Raritan Basin System.	$772,000	$666,000	$106,000
Actual allocation based upon audited expenditures F/Y18 (7/1/17-6/30/18) - Appendix II	$677,639	$584,583	$93,056
Adjustments F/Y18	($94,361)	($81,417)	($12,944)
Net Allocation for F/Y2020 Budget	$659,532	$568,062	$91,470
Estimate	$660,000	$568,000	$92,000

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 6 - Proposed Capital Equipment Budget

Fiscal Year 2020

	Description	(R) Replacement (A) Addition	Year of Purchase	Dollar Value	Depreciation Reserve
INFORMATION SYSTEMS	(1) SERVER - ADMIN. BUILDING	(R) FF2013	2006	10,000	4,987
	(1) BACKUP SOLUTION	(A)		5,000	
FACILITIES	(1) WALK BEHIND SWEEPER	(A)		5,500	
	(1) AIR COMPRESSOR RVMB	(R) 742	1986	7,000	1,685
	(1) NJWA-36 REPLACEMENT	(R) TR2070	2008	40,000	22,147
	(1) NJWA-42 REPLACEMENT	(R) TR2032	2007	45,000	34,048
GROUNDS	(1) PORTABLE LIGHT TOWER	(R) EQP105	1983	10,000	3,836
	(1) PORTABLE GENERATOR	(A)		3,200	
	(1) TOW BEHIND AIR COMPRESSOR	(A)		15,000	
	(1) CONCRETE SAW AND CART	(A)		2,500	
	(1) GUARDRAIL TENSIONER	(A)		6,000	
	(1) GAS POWERED PUMP	(A)		3,000	
CANAL	(1) TANDEM DUMP TRUCK (REPLACE NJWA-47)	(R) TR1907	2003	190,000	94,900
	(1) J.D. TRACTOR	(R) 679	1986	70,000	7,955
	(1) YORK RAKE	(A)		10,000	
	(1) FLAIL MOWER	(R) 1778	2000	9,000	2,629
	(2) TORO RIDING MOWERS	(R)2053	2007	50,000	42,310
AUTO SHOP	(1) SCANNER SOLUS EDGE	(R)2252	2015	3,500	2,921
	(1) I/R AIR COMPRESSOR	(R)1858	2002	8,000	6,315
	(1) SNAP-ON SOLUS EDGE DIAGNOSTIC SCAN	(R)1940	2004	4,000	7,207
SAFETY	(2) AED UNITS	(R)2203/2204	2012	4,000	3,235
SECURITY	(1) NJWA-64 REPLACEMENT	(R) TR2275	2016	32,000	15,668
WATERSHED	(1) VEHICLE 4WD FOR SAV MGT PLAN	(A)		35,000	

	TOTAL COST	$567,700	$249,843
LESS AMOUNT CHARGED TO DEPRECIATION RESERVE		(249,843)	
	NET TOTAL	$317,857	
LESS AMOUNT CHARGED TO CAPITAL EQUIPMENT RESERVE		($150,000)	
	TOTAL	$167,857	
	AMOUNT FUNDED FOR FY2020	**$167,900**	

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 7 - Estimate Of Interest Income For Fiscal Year 2020 Budget

Fund/Reserve	TD Bank Funds
Operating	$ 3,400,000
Reserve for O & M	2,210,000
Pumping Reserve	1,400,000
Self-Insurance Reserve	300,000
Rate Stabilization Fund	85,000
Estimated Total	$ 7,395,000

$7,395,000	x 1.0% =	$ 73,950
	Total	$ 73,950
	Estimate	$ 74,000

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

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 8 - Unanticipated Revenue

Funds to be appropriated Into the Rate Stabilization Fund for Fiscal Year 2020

				Amount
F/Y2018 Net Year-End Balance				$762,000.00
Overdrafts	Invoice No.	Billed	Amount	
NJ American	1588	11/01/17	$ 50,823.36	
Stonebridge Community Associates	R-238	02/01/18	$ 278.64	
Stonebridge Community Associates	R-239	02/01/18	$ 223.93	
East Brunswick	R-236	12/14/17	$ 154.59	
		Total	$ 51,480.52	
	Amount used in FY2019		-	
		NET		$51,480.52
Overdrafts Not Billed, Accrued through July, 2018				
NJ American, Greenbriar @ Stonebridge				$119,698
Other Sources of Funds				$35,000
SWP funding of Watershed Vehicle				
		Grand Total		$968,178.52
		FY20 Budget		$968,180.00

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 9 - Fund Balances as of 6/30/18

Final

	REVENUE FUND	OPERATING ACCOUNT	OPERATING FUND	O & M RESERVE	LONG-TERM INVESTMENTS O & M RESERVE	TOTAL
BALANCE 6/30/18	$1,858,475	$3,418,450	$463,144	$2,208,858	$1,456,921	$9,405,848
Deduct: Accrued expenses to be paid as of 6/30/18			(281,142)			(281,142)
Deduct: June 1st billing, received			(1,809,078)			(1,809,078)
Adjusted Balances 6/30/18	$1,858,475	$3,418,450	($1,627,076)	$2,208,858	$1,456,921	$7,315,628
INCOME						
Reimbursement Manasquan Receipt of Headquarters Overhead Expenses for 7/10/18			163,000			163,000
Operating transfer	(1,860,000)	(3,400,000)	5,260,000			-
EXPENSES						
O & M Expenses - (A/P 6/30/18) Includes accrued Payroll and Insurance thru 6/30/18			(308,898)			(308,898)
Capital items to be purchased by 6/30/18			(118,564)			(118,564)
Various Reserve contributions (one month)			-			-
PROJECTED BALANCE AT 6/30/18	($1,525)	$18,450	$3,368,462	$2,208,858	$1,456,921	$7,051,166

Note 1. Unanticipated Revenues for F/Y 20
(overdrafts in F/Y 18 to be available for appropriation to Rate Stabilization for FY19/FY20)

NJ American	50,823
Stonebridge Community Associates	503
East Brunswick	155
Total	51,481

Less: FY2019 O & M reserve balance (3 mos required by resolution)	(3,594,645)
Adjusted balance of funds available 6/30/18	3,456,521
Use of Available Funds	
Unanticipated revenues (overdrafts in F/Y 18 to be available for appropriation to Rate Stabilization Fund for FY19/FY20 (Note 1)	(51,481)
Rate Stabilization Fund Transfer for FY19	(890,290)
Projected Net Balance	**$2,514,750**

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 10 - Projected Fiscal Year 2020 Operations & Maintenance Component and Debt Service Assessment Sales Base

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 2020 Operations & Maintenance Component and Debt Service Assessment Sales Base

USER	DAILY ALLOCATION (MGD)	DAYS PER YEAR	TOTAL MG/YR	ANNUALIZED SALES BASE (MGD)
Lamington Farms LLC (Trump National Golf Club)	0.170	365	62.100	0.170
Morris County Municipal Utilities Authority	0.079	365	28.830	0.079
Mt. Olive Township	0.010	365	3.554	0.010
Washington Township Municipal Utilities Authority	0.035	365	12.775	0.035
Borough of Glen Gardner	0.008	365	2.775	0.008
Roxiticus Golf Club	0.046	365	16.790	0.046
Hamilton Farm Golf Club	0.138	365	50.400	0.138
Springdale Golf Club	0.098	365	35.640	0.098
NJ Department of Corrections	0.025	365	9.250	0.025
Stonebridge Community Assoc.	0.081	365	29.565	0.081
Village Grande @ Bear Creek	0.074	365	27.010	0.074
Eastern Concrete Materials	0.023	365	8.500	0.023
Hunterdon Medical Center	0.031	365	11.000	0.031
Princeton University Operations	0.027	365	9.855	0.027
Renaissance at Monroe Condominium Association	0.014	365	5.110	0.014
			TOTAL SALES BASE	**182.353**

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 11 - Operations And Maintenance Rate Component
Fiscal Year 2020

Funds Required for F/Y2020 Budget

Proposed Operating Expense and Capital Budget	$14,029,038
Less Miscellaneous Revenues & Interest Income	($126,200)
Other Available Funds	($968,180)
Net Budget Requirement	$12,934,658
Less: 182.353 x 194.00 x 61Days (Cash received in July and August for water used in May and June based on $194.00/mg)	($2,157,965)
Additional Revenue required to cover Operations and Maintenance Expense through 6/30/20	$10,776,692

Computation of Operations & Maintentance Rate for Fiscal Year 2020

Sales Base
Period 7/1/19 to 4/30/20 305 days x 182.353 mgd = 55,617.67 mg

Required Operations & Maintenance Rate F/Y2020

$$\frac{\$10,776,692 \text{ mg}}{55,617.67 \text{ mg}} = \$194.00 \text{ mg}$$

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 12 - Debt Service Rate Component For NJEIFP Loan Repayment

Debt Service Rate Component for NJEIFP Loan Repayment

Effective July 1, 2019, (F/Y2020, July 1, 2019-June 30, 2020)

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

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

*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	182.339	182.339	182.353	182.353	182.353
	0.0373%	0.0000%	0.0077%	0.0000%	0.0000%
Source Water Protection Fund	**Actual FY'16**	**Actual FY'17**	**Actual FY'18**	**Adopted FY'19**	**Proposed FY'20**
Fund Component Rate	**$24.00**	**$24.00**	**$24.00**	**$24.00**	**$24.00**
Annual Household Impact	$2.52	$2.52	$2.52	$2.52	$2.52
Opening Balance July 1	$3,712,909	$4,248,260	$4,762,469	$4,989,889	$4,773,374
Total Rate Component	1,602,000	1,597,200	1,597,404	1,597,412	1,597,412
Rate Component Watershed	299,492	299,492	299,515	299,515	299,515
Rate Component Land	1,302,508	1,298,708	1,297,889	1,297,897	1,297,897
Interest and Other Additions	6,404	10,194	30,657	6,095	30,657
Total Available	5,321,313	5,856,654	6,390,530	6,593,396	6,401,443
Available Watershed	2,096,527	2,396,019	2,668,830	2,616,768	2,216,283
Expenditure Watershed	0	26,703	351,577	700,000	399,515
Balance Watershed	2,096,527	2,369,316	2,317,253	1,916,768	1,816,768
Available Land	3,224,787	3,460,636	3,721,699	3,976,628	4,185,160
P/D & Adm/ & Cash for Easements	37,600	10,375	0	15,000	15,000
Property Administrators	0	0	0	0	0
Debt Service & Trust Fees Land	1,035,453	1,057,107	1,049,064	1,105,022	1,110,532
Other Land Expenditure					
Total Expenditure Land	1,073,053	1,067,483	1,049,064	1,120,022	1,125,532
Balance Land	2,151,734	2,393,153	2,672,635	2,856,606	3,059,628
Total Project Expenditures	1,073,053	1,094,186	1,400,641	1,820,022	1,525,047
Ending Balance June 30	$4,248,260	$4,762,469	$4,989,889	$4,773,374	$4,876,396

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 14 - Capital Improvement Program

Fiscal Years 2019-2023

Rate Assumption Per Million Gallons:

	ESTIMATED	Period			$33	$33	$45	$45	$55
	PROJECT	First	Priority	Prior	FY	FY	FY	FY	FY
PROJECT	COST	Identified		Years	2019	2020	2021	2022	2023
Dredging Kingston & Amwell Road - Design engineering only (some is bonde	$ 2,261,712	2006	High	2,134,133	127,579				
Dredging Kingston & Amwell Road - Construction engineering only (bond)	$ -	2006	High	-					
Dredging Kingston & Amwell Road - Construction $41M (bond)	$ -	2006	High	-					
Rehabilitate Western Embankment Stockton Borough	$ 5,100,000	2006	High	187,278	130,000	4,782,722			
Rehab Swan Creek Aqueduct new project includes culvert work	$ 1,200,000	2015	High		100,000	100,000	500,000	500,000	
Dam Impmnts as recommended by TRB (preliminary eng and Owners eng)	$ 2,600,000	2013	High	2,165,578	100,000	175,000	159,422		
RV Res Dams-Rehab & Resource Preservation Project (eng only)	$ 5,000,000	2015	High	2,235,292	2,000,000	764,708			
Round Valley Dam Improvements - Construction (bond) Est $58M	$ -	2015	High	-					
Construction eng management for RV dam improvements (bond) Est. $5M	$ -	2015	High	-					
Grouting abutments of RV embankments (bond) Est $3.8M	$ -	2016	High						
Dredging chanel intake to RV South Dam Tower (bond) Est $1M	$ -	2016							
Security Improvements at RV reservoir (cameras)	$ 1,200,000	2016	High	-	900,000	300,000			
Security Improvements at RV and SR (Perimeter hardening)	$ 800,000	2017	High	-		200,000	200,000	400,000	
New 2D Inundation mapping for Round Valley and Spruce Run Reservoir	$ 500,000	2015	High	-	100,000	400,000			
Dredging of Intake Pond and replace ice deflectors at SBPS	$ 1,800,000	2005	High	103,711	150,000	1,546,289			
Griggstown Waste Gate - Repair @ Station 2083+40	$ 445,000	2017	High	70,890	374,110				
Rehab of 6-Mile Run Culvert	$ 1,200,000	2008	High	40,730	100,000	1,059,270			
Replace Fuel system pumps and software/inventory system at Spruce Run Ad	$ 300,000	2017	High	-	275,000	25,000			
Replace office phone system - Authority Wide	$ 75,000	2017	High	-	75,000				
Refurbishment of the Main Pumps & Motors 4, 5, 7, & 8 with additional upgrad	$ 3,750,000	2008	High	-	600,000	2,200,000	950,000		
Replace Boilers at Spruce Run Administration Building	$ 175,000	2018	High		100,000	75,000			
Replace Water storage tanks in Spruce Run Administration Building Baseme	$ 100,000	2018	High		100,000				
Replace roof on Round Valley Surge Tank	$ 100,000	2018	High		100,000				
Purchase a generator for RV SR Towers/Vaults plus transfer switch at SR	$ 200,000	2018	High		200,000				
Rehab/Relocate Spruce Run Administration Building Sewer Line	$ 100,000	2018	High		100,000				
	$ 26,906,712								
Rehab of Upper Canal Embankment - Raven Rock to Prallsville	$ 4,800,000	2006	Med High	105,419	50,000	1,000,000	1,000,000	1,000,000	1,644,581
Rehab of Canal Flow Control Structures Griggstown and 10-Mile Locks	$ 1,500,000	2000	Med High	-				50,000	1,450,000
Rehab of the Landing Lane Spillway and rehab slope d/s of Island Farm Weir	$ 1,850,000	2013	Med High	47,994	125,000	1,677,006			
Rehab of Spruce Run Weir	$ 1,200,000	2016	Med High	-	75,000	100,000	1,025,000		
Spruce Run Reservoir - Replace Fixed Cone Valves and other ancillary items	$ 400,000	2017	Med High	-	50,000	350,000			
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)	$ 350,000	2003	Med High	100,992	150,000	25,000	25,000	25,000	24,008.38
	$ 10,900,000								
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			
Replacement of Through the Wall HVAC Units in SRA	$ 175,000	2011	Medium		175,000				
Rehab of Culvert at Station 2550+90 (1 mile upstream of 10-mile)	$ 700,000	2008	Medium						700,000
Replace underground heating oil tank at South Branch Pumping Station	$ 300,000	2018	Medium						300,000
Rehab of Traprock Spillway	$ 1,200,000	2010	Medium						1,200,000
	$ 3,225,000								
Dredging between Landing Lane and Route 18 - engineering	$ -	2007	Low						
Dredging of Canal Between Lambertville and Route 1	$ -	2015	Low						
Dredging of Canal Between Amwell Road and 10 Mile	$ -	2015	Low						
Spruce Run Administration Building Tie-in to Public Water Supply	$ -	2018	Low						
Storage Building near Spruce Run Annex	$ -	2018	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						
	$ -								
TOTAL	**$ 41,031,712**		**-**	**7,206,417**	**6,281,689**	**14,840,595**	**3,859,422**	**3,275,000**	**5,568,589**
Balance CIP				**20,446,428**	**16,361,186**	**3,717,037**	**2,852,769**	**2,572,923**	**665,078**

The estimated project costs listed includes engineering, cultural, construction and miscellaneous expenses.
Funds in CIP as of June 30, 2018 is $13,446,428 plus $7,000,000 from Capital Improvements Investments
Cost for the Dredging of the Canal between Kingston & Amwell Road of $41,000,000 represents construction costs.
Spruce Run Improvements - An extensive ranging grouting program is anticipated on an approximate 4-year timeline.

RARITAN BASIN SYSTEM
CAPITAL IMPROVEMENT PROGRAM
Fiscal Years 2019 – 2023
Updated – August 2018

The following is a description of projects that the Authority anticipates being funded from the Capital Improvement Program ("CIP") in Fiscal Years 2019 – 2023. Discussion also includes projects that may be delayed beyond FY 2023 due to funding.

HIGH PRIORITY
Dredging Kingston & Amwell Road - Design engineering only (some is bonded, $1.5M)
Dredging Kingston & Amwell Road - Construction engineering only (bond)
Dredging Kingston & Amwell Road - Construction $41M (bond)
Rehabilitate Western Embankment Stockton Borough
Rehab Swan Creek Aqueduct new project includes culvert work
Dam Improvements as recommended by TRB (preliminary engineer and Owners engineer)
RV Reservoir Dams-Rehab & Resource Preservation Project (eng only)
Round Valley Dam Improvements - Construction (bond) Est $58M
Construction engineering management for RV dam improvements (bond) Est. $5M
Grouting abutments of RV embankments (bond) Est $3.8M
Dredging channel intake to RV South Dam Tower (bond) Est $1M
Security Improvements at RV reservoir (cameras)
Security Improvements at RV and SR (Perimeter hardening)
New 2D Inundation mapping for Round Valley and Spruce Run Reservoir
Dredging of Intake Pond and replace ice deflectors at SBPS
Griggstown Waste Gate - Repair @ Station 2083+40
Rehab of 6-Mile Run Culvert
Replace Fuel system pumps and software/inventory system at Spruce Run Admin
Replace office phone system - Authority Wide
Refurbishment of the Main Pumps & Motors 4, 5, 7, & 8 with additional upgrades
Replace Boilers at Spruce Run Administration Building
Replace Water storage tanks in Spruce Run Administration Building Basement
Replace roof on Round Valley Surge Tank
Purchase a generator for RV SR Towers/Vaults plus transfer switch at SR
Rehab/Relocate Spruce Run Administration Building Sewer Line
MEDIUM / HIGH PRIORITY
Rehab of Upper Canal Embankment - Raven Rock to Prallsville

Rehab of Canal Flow Control Structures Griggstown and 10-Mile Locks
Rehab of the Landing Lane Spillway and rehab slope d/s of Island Farm Weir
Rehab of Spruce Run Weir
Spruce Run Reservoir - Replace Fixed Cone Valves and other ancillary items
Repair of Pipe at Whitehead Road
Rehabilitation Work at Washington Crossing Spillway
Security System and Upgrades (Clinton and Canal)
MEDIUM PRIORITY
Alexauken Creek Aqueduct
Rehabilitation of Carnegie Lake Creek Aqueduct
Replacement of Through the Wall HVAC Units in SRA
Rehab of Culvert at Station 2550+90 (1 mile upstream of 10-mile)
Replace underground heating oil tank at South Branch Pumping Station
Rehab of Traprock Spillway
LOW PRIORITY
Dredging between Landing Lane and Route 18 - engineering
Dredging of Canal Between Lambertville Lock and Route 1 in Trenton
Dredging of Canal Between Amwell Road and 10 Mile Lock
Spruce Run Administration Building Tie-in to Public Water Supply
Storage Building near Spruce Run Annex
Clearing Spruce Run Spillway
Construction Bedload Stone Trap @ Wickecheoke Creek
Cutoff Wall in Shipetaukin Creek Guard Bank
Wickecheoke Creek Gates Abandonment
Rehab of Waste Gate downstream of 10 Mile - woodwork on façade
Rebuild Stone Embankment at the 10 Mile Waste Gate
Rehab of Gold Run Spillway
Carnegie Lake Culverts Investigation / Isolation
Raven Rock retaining wall downcanal of Lock
Refurbishment of the Main Pumps & Motors 3 & 9
Refurbishment of the Main Pumps & Motors 2 & 10
Canal Culvert Rehabilitation 2249+79 (Suydam)
Canal Culvert Rehabilitation 2661+86 (Randolph Brook)
Canal Culvert Rehabilitation 2992+34 (Mile Run Culvert)
Concrete Repairs at the Sullivan Way Aqueduct
Rehab of Spillway upcanal of Griggstown Lock
Rehab 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 – Construction Engineering (bond)
Dredging between Kingston and Amwell Road – Construction $41M (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 of.

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 from this site that was previously dredged as part of the Authority's maintenance dredging program 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 were targeted and the design documents were completed. The determination of the disposal site (final destination) of the dredged material was the final critical element in the design.

Removal of sediment from this reach is planned for FY 2018 - 2021. The application for funding through the New Jersey Infrastructure Bank (I-Bank), formerly the New Jersey Environmental Infrastructure Trust, was resubmitted and formulated to cover the full estimated construction cost of the dredging, full-time inspection and construction management for the first dredging year by Urban Dredging, and other allowable expenses.

All permits for the project were obtained. A contract was executed with the lowest responsive bidder, J.F. Brennan Company, Inc., La Crosse, Wisconsin, and they mobilized on March 14, 2018. The contractor made all preparations for dredging that included tree trimming and construction of the staging area to act as a dewatering platform for the geobags.

Dredging started in the second week of July 2018. It is anticipated that three dredges will be operating from July through October in 2018. A floating excavator is in place with each dredge that removes debris and sub-aqueous vegetation ahead of the dredging operation. All dredge material is being pumped through pipelines floating on the Canal to the staging area where the sediment is dewatered in the geobags. The Authority has reached an amicable agreement with Wyeth Holdings, LLC for beneficial reuse of the sediment at the American Cyanamid Superfund Site in Bridgewater, New Jersey. Once the material has dried sufficiently and has been found to meet all required criteria, it will be transported to its final destination in Bridgewater. Three seasons of dredging are anticipated to complete this very important project. Guidelines for material acceptance and appropriate testing protocols have been agreed upon by all parties including NJDEP and the Environmental Protection Agency.

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, more than 1,000 linear feet of the embankment experienced slope failure on the Canal side due to the saturation of the embankment from the river, and significant amounts of soils slid into the Canal. 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 failure by piping through seepage when the river is approaching the top of the embankment, or the threat of overtopping the entire embankment causing failure by 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 have been 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, a total cost of $5.1M is included in the CIP to cover engineering, construction, and cultural resources services. The work is currently projected to occur in FY 2019 and 2020.

The chosen design will entail restoration of all areas that were damaged during Tropical Storms Irene and Lee. The tarps that were placed over those areas will be removed. Grass growth will be reestablished on the canal-side slopes in those areas and the damaged historic stone on the river-side slopes will be restored. A pilot grouting program will be introduced at select sections of the subject embankment. The pilot program will also serve as a guide (both cost and effectiveness) for future grouting work that may be used in future years over the balance of the embankment.

Rehabilitation of the Swan Creek Aqueduct & Culvert

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

Repairs were made to the 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 (bond) (est $58M)
Construction Engineering Management for RV Dam Improvements (Bond Est $5M)
Owner's Engineer - Construction of RV Dam Improvements During Construction
Grouting abutments of RV North and South Dams (bond) Est $3.8M
Dredging of intake channel at RV South Dam Tower (bond) Est 1M
Security Improvements at RV Reservoir

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

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

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

- Foundation rock grouting, particularly at the embankments' abutments to mitigate potential sources of seepage;

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

Schnabel Engineering has now 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.

Schnabel Engineering is well into schematic design. The following represents a summary of the current tasks that are part of their evaluation:

- Dredging of the Round Valley South Tower Intake Channel (detailed below);
- Security improvements at RV Reservoir (detailed below);
- Consider alternatives to rehabilitate the hydraulic valve on the Round Valley South Dam (detailed below);
- Remove and replace 10-inch Cast Iron Pipe that connects the RV Force Main to the RV South Vault (detailed below);
- Repairs to the Round Valley building structures (Towers and vaults, detailed below);
- Installation of a new blanket drain system on the downstream slopes of all three embankments at Round Valley to filter the existing seepage; and
- Installation of new toe drains to filter, collect, and convey embankment and foundation seepage safely away from the structures.

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 Infrastructure Bank (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.

Grouting of Abutments at North and South Dams

Following an initial recommendation from the TRB, the Engineer of Record reviewed all of the grouting records associated with the original construction. The Engineer of Record has recommended grouting of the abutments at the North and South Dam. The abutments are the sides of the dam where the constructed embankment meets the existing valley slope. Review of the original grouting records suggests that the grouting was terminated before it reached the end of the abutments. The grouting will be accomplished by drilling through the overburden soils and into the bedrock below. Cementitious grout will then be pumped under pressure into the

bedrock to fill existing cracks or voids that may be present. This project is expected to be completed by the summer 2019.

This project will be bid out separately from the other RV projects so that it can be completed ahead of the large scale embankment modifications. It is anticipated that this work will be paid for through a separate application for bonding. Since it will be bonded, funding is not included in the CIP budget.

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 50+ years of pumping from the river, the constructed channel has filled with sediment. As part of the large-scale Round Valley Rehabilitation & Resource Preservation Project, the consultants were asked to design the effort necessary to remove the significant volume of sediment from the channel.

The investigation and design for this project is included in the scope for the Engineer of Record on the Round Valley Reservoir Dams-Rehabilitation & Resource Preservation Project. The pre-final plans and specifications have already been reviewed by Authority staff and applications have been made for permits. It is anticipated that the sediment will be collected using a suction dredge. The chosen design calls for relocation of the sediment to the deepest parts of the reservoir. This project is expected to be completed by the end of summer 2019.

This project will be bid out separately from the other RV projects so that it can be completed ahead of the large scale embankment modifications. It is anticipated that this work will be paid for through a separate application for bonding. Since it will be bonded, funding is not included in the CIP budget.

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 potential improvements to existing cameras and recommended the addition of new cameras as the most prudent means of enhancement. The investigation and design for this project is included in the scope for the Engineer of Record on the Round Valley Reservoir Dams-Rehabilitation & Resource Preservation Project. It is anticipated that this work will be paid for from the CIP budget and be completed in FY 19.

Embankment Modifications

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

Schematic design is now complete. The report has not been finalized, but the scope of the design was discussed and vetted at a meeting that included the Engineer of Record, members of Authority staff, representatives of the NJDEP Dam Safety Section, the Authority's Technical Review Board, and the Owner's Engineer. For the North and South Dams, the schematic design includes excavation into each dam while maintaining a slope not steeper than 2.5 horizontal to 1.0 vertical. The soils removed from the embankments will be stockpiled at or near each dam site. Once the excavation has reached a certain depth, the sand filter will be installed across the entire exposed downstream slope. In order to maintain a crest width sufficient for construction operations, the crests of each dam will be temporarily lowered. It is anticipated that the maximum allowable reservoir elevation during the period of time that the dams are excavated will be EL 360 feet, or 25 feet below full pool.

The major excavation work must be preceded by the installation of dewatering wells and piezometers. The dewatering or well points will act to lower the phreatic line in the embankments. The phreatic line is the line through the embankment cross-section below which seepage takes place. The new piezometers will determine the effectiveness of the well points which must be proved prior to excavation into the embankments.

Construction is expected to initiate in mid to late 2019 with the installation of the well points. Large scale excavation of the embankments is currently scheduled to take placed in early 2020.

It is anticipated that this work will be paid for through a separate application for bonding. Since it will be bonded, funding is not included in the CIP budget

Rehabilitate Hydraulic Valve on RV South Dam Low-Level Release

The existing RV low-level release valve was last rehabilitated in 1992 when a hydraulic valve actuator and hydraulic control system were installed at the Round Valley South Tower. This hydraulic system, with hoses reaching down to 180 feet below the water surface to the low level release valve, replaced the out-of-service original control system. The hydraulic valve installed in 1992 is no longer functional and requires rehabilitation.

The investigation and design for this project is included in the scope for the Engineer of Record on the Round Valley Reservoir Dams-Rehabilitation & Resource Preservation Project. One of the alternatives being evaluated is the complete abandonment of the low-level release which would likely entail filling of the pipeline with grout. If rehabilitation is chosen, the replacement of the hydraulic lines to the underwater actuator must be done with commercial divers due to the extreme depths. The entire system will also be analyzed to determine if any additional repairs are required. It is anticipated that this work will be included in the contract for the large scale embankment modifications and paid for through the above noted bonding. Since it is being bonded, funding is not included in the CIP budget.

Rehabilitation of 10-inch Cast Iron Pipe Connecting RV-S Dam Vault to Force Main

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 included in the contract for the large scale embankment modifications and paid for through the above noted bonding. Since it is being bonded, funding is not included in the CIP budget.

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

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

The Engineer of Record has already made inspections, including underwater portions, of the two towers in the Round Valley Reservoir. The work on the towers will include but not necessarily be limited to repairs to the sluice gates, roof replacements, access ladder replacements, replacement of the existing cranes, and installation of a transfer switch for connection to an emergency generator,

It is anticipated that this work will be included in the contract for the large scale embankment modifications and paid for through the above noted bonding. Since it is being bonded, funding is not included in the CIP budget.

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 show 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."

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 ice deflectors 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 replaced as part of the pond dredging project.

Authority staff has procured 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. The design is complete and was submitted to the appropriate agencies for permitting. The potential existence of a threatened and endangered species has necessitated surveying by an expert on that species. It is now anticipated that the dredging will take place in FY19 – FY20.

Griggstown Waste Gate and Embankment Seepage Repair Station 2083+40

The Griggstown Waste Gate is located on the Canal left bank, approximately 160 feet 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, led staff to be concerned that there was an ongoing internal erosion condition. It was believed that the structural deficiencies were leading to the potential internal erosion of soil particles within the embankment.

An engineering consultant was procured to design a repair for the structure. The consultant provided a design that considered the high historic sensitivity of the structure.

The consultant recommended cementitious grouting of the embankment between the headwall structures and in-kind repairs to the upstream concrete headwall. Bids were received and a construction contract was awarded in May 2018. All work on the project was completed in mid-August 2018.

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.

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

A sinkhole formed in the roadway above the structure, requiring emergency repairs. The emergency repairs were performed by a consultant and contractor procured by the Authority.

This sinkhole suggests that the movement of soils above the stone arches that form the culvert is occurring. The emergency repairs were considered to be temporary. Inspections of the upstream interior of the culvert located directly beneath Canal Road have confirmed missing stones and movement of soil.

Additional temporary repairs will be procured to limit the loss of stonework in the interior of the culvert by filling with a lightweight concrete. Next, engineering services will be procured to clean and inspect the culverts and to design repairs to the stonework inside the culverts. The engineering services will address any structural deficiencies found in the structure to provide for a long term rehabilitation. The temporary repair will be removed and replaced with appropriate historical aesthetics of the stonework. Further, the collapsed stone façade on the downstream headwall will be replaced. Engineering services will be procured in FY19 with construction to follow.

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 have been procured to 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, dispensers and the card reader system, expansion of the Veeder-Root system to the fuel-oil and waste tanks, installation of fuel recovery pipe dispenser sumps, and replacement of the fuel island and the existing canopy. This project will also include the removal and abandonment of the auto shop waste oil 550 gallon UST steel tank which was installed in 1987, inclusive of LSRP services and permits. Construction will take place in FY 19.

Replace Office Telephone System 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 including voicemail to email; extension dialing between Authority locations; teleconferencing within the system and dedicated teleconference units for each location that will be standardized; and digital recording capability on phones and conference phones.

Facilities personnel will also be able to access and service all systems from one location. Upgrading the systems would necessitate the replacement of all components including handsets, door phones, and conference phones. Additional and replacement wiring and switching will also be required. The capability may exist to combine the Administration Building and Watershed Building to one system. Phone system replacement is anticipated for FY19.

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

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

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

This project represents the second phase of the rehabilitation. The engineering consultant will investigate and design the rehabilitation of four additional pumps in the north and south bays of the SBPS, listed as pumps Numbers 4, 5, 7, and 8. It is expected that the consultant will perform an investigation to identify appropriate rehabilitation items, secure needed permits and approvals, and prepare the construction plans and specifications that are necessary to bid the project. Other miscellaneous pump station system upgrades, including electrical and control upgrades are anticipated to be addressed in this project as well.

Replace Boilers at Spruce Run Administration Building

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

Replace Water Storage Tanks in Spruce Run Administration Building Basement

The two water storage tanks in the Spruce Run Administration Building basement have reached the end of their service life and are in need of replacement. The tanks act as a buffer/storage for the well water that is pumped up out of the Administration building's well. The replacement of these water tanks should be planned for in the near future. Replacement of several doors to the basement is pending and shall potentially be added to this contract, since the tanks are very large and require the removal of the doors.

Replace Roof on Round Valley Surge Tank

The Round Valley Force Main Surge Tank roof has been identified to be in need of repair/replacement, due to continued damage from large storms. This project would also require engineering analysis and design of the replacement/repairs.

Purchase a Generator for RV SR Towers/Vaults plus Transfer Switch at Spruce Run

The Authority has identified the need for a trailer-mounted generator to be kept in close proximity to the Clinton facilities. This project would require electrical engineering analysis and sizing of the generator. This project would also require electrical modifications at the Spruce Run Tower as well as potentially at the Round Valley Towers, as well as any other remote locations that could be adapted to function with this generator as needed to provide additional redundancies in case of emergencies.

Rehabilitation/Relocation of Spruce Run Administration Building Sewer Service Lateral

The sanitary sewer lateral servicing the original 1960's portion of the building backed up and partially failed in the summer of 2018. The replacement of the old sewer lateral requires that the contractor trench around the front of the administration building since a portion of the lateral is inaccessible under the original floor slab and offices. This also requires the reconfiguration of plumbing in the basement and a new wall penetration out the front of the building. This work is permitted through the NJ DCA State Buildings Unit with a Master Plumber. The work is anticipated to be completed in August 2018.

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 Authority had to implement emergency measures to prevent further erosion of the embankment following Tropical Storms Irene and Lee in 2011. Due to the location and access issues discussed above, all of the work had to be done by hand. Barges were used to supply the materials (riprap and cement bags), and Authority forces placed the materials in the embankment to the 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 ("GZA") 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.

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.

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 has procured and engineer and a cultural resource consultant. The schematic designs are near complete. Construction is anticipated to occur in FY2020.

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 and upstream from its confluence with the South Branch of the Raritan River. The adjacent USGS gauging 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; however, the concrete structure is severely degraded, with large amounts of exposed reinforcing steel and visible through seepage suggesting that the structure has clearly met the end of its useful life.

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.

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 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 northernmost pipes. Seepage may cause damage to the spillway structure, the bridge tender's house or the bridge abutment as a result of removal of fines by piping or undermining.

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

Security System 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 19. 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 is comprised 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.

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, including formulating a plan for engineering services required and HVAC construction code permits required.

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

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

Replace Underground Heating Oil Tank at South Branch Pumping Station

The existing 10,000 gallon steel underground storage tank ("UST") which contains heating oil for the pumping station was installed in 1987 and is in excess of 30 years old. EPA/NJDEP regulations require cathodic protection and testing. If replaced with an underground tank, it would likely be replaced with a modern double-wall fiberglass reinforced UST. This project would also include the abandonment/removal of the existing steel tank with LSRP and permitting. Consideration would be made for replacement with an above ground tank as well.

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 conclusion of the dredging program between 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. Funding for this project is not included in this five year program.

Dredging between Lambertville Lock and Trenton

Sediment was removed from this reach in the mid-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. Funding for this project is not included in this five year program.

Dredging between Amwell Road and Ten Mile Lock

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

Spruce Run Administration Building Tie-In to Public Water Supply

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

Storage Building near Spruce Run Annex

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

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 will 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.

Clearing of the spillway is also 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. Funding for this project is not included in this five year program.

Construction of a Bedload Stone Trap at the Wickecheoke Creek

Wickecheoke Creek enters the Canal just upstream of the Prallsville Lock Control Structure on the border of Delaware Township and Stockton Borough in Hunterdon County. Excess flow from the Canal and the Creek are discharged over the Wickecheoke Creek spillway into the Delaware River. Investigations in the early 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. This project is currently on hold and has been moved to low priority. Funding for this project is not included in this five year program.

Cutoff Wall in the Shipetaukin Creek Guard Bank

The Shipetaukin Creek Guard Bank located in Lawrence Township, Mercer County, was constructed along the western side of the Canal to separate the Canal from the Lawrence Meadows and Shipetaukin Creek. The Guard Bank breached during Hurricane Floyd in September 1999 because of high water levels in 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 Ten 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 of being bowed inward. Additional inspection is required to determine the priority of repairs. Funding for this project is not included in this five year program.

Canal Culvert Rehabilitation 2661+86 (Randolph Brook)

The Randolph Brook culvert structure consists of three distinct sections. Looking downstream from the inlet, the culvert has a semicircular corrugated steel section that is 63 feet long, 13 feet wide and 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 that are 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 was comprised of the restoration of the headwalls and deteriorated barrels. A structural steel liner was installed in the east barrel, set back 15 feet from the upstream end and 25 feet from the downstream end. The shotcrete liner in the west barrel was patched as needed.

A previous inspection revealed that the east barrel's first 25-foot brick liner section has minor spalls and the remaining metal liner section 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 Upcanal of the Griggstown Lock

The spillway upcanal of the Griggstown Lock between Station 2060+40 and Station 2064+20 of the Canal in Franklin Township, Somerset County is in poor condition and warrants rehabilitation. The 380-foot long spillway was built as part of the original Canal construction in the 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 during the project. Funding for this project is not included in this five year program.

Rehabilitation of the Four-Mile Spillway

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

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

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

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

Funding for a more thorough evaluation by an outside consultant is not included in this five year program; however, the Authority continues to 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, 2019

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:

Period (State Fiscal year or otherwise indicated)	Allocation	Rate/Million Gallons
State fiscal year [2019] **2020**	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.

Period (State Fiscal year or otherwise indicated)	Allocation	Rate/Million Gallons
State fiscal year [2019] **2020**	Million Gallons per Day (MGD)	$85.00

7:11-2.5 Capital Fund Component

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

(c) Capital Fund Assessment

Period (State Fiscal Year or otherwise indicated)	Allocation	Rate/Million Gallons
State Fiscal Year [2019] **2020**	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

Period	Allocation	Rate/Million Gallons
(State Fiscal Year or otherwise indicated)		
State Fiscal Year [2019] **2020**	Million Gallons per Day (MGD)	$24.00

APPENDICES

I. Report of Mercadien PC – Allocation of Headquarters General and Administrative Expenses – FY2020

II. Report of Mercadien PC – Allocation of Headquarters General and Administrative Expenses – Audited FY2018 Expenditures