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 2022

ADJUSTMENT OF DEBT SERVICE ASSESSMENT AND SALES BASE FOR DEBT SERVICE PAYMENTS DUE AND REQUIRED FOR FISCAL YEAR 2022

ADJUSTMENT OF GENERAL RATE SCHEDULE FOR CAPITAL FUND COMPONENT FOR FISCAL YEAR 2022

ADJUSTMENT OF SOURCE WATER PROTECTION FUND COMPONENT FOR FISCAL YEAR 2022

Proposed effective Date: July 1, 2021

Approved: 11/2/2020

NEW JERSEY WATER SUPPLY AUTHORITY
PROPOSED RATE ADJUSTMENTS FOR FISCAL YEAR 2022
RARITAN BASIN SYSTEM

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PART I - EXPLANATION OF PROPOSED REVISED RATE STRUCTURE

Overview of Rate Proposal for Fiscal Year 2022 (July 1, 2021 - June 30, 2022)

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, 2021.

Summary of Proposed Adjustments

Component	Current (FY2021) Rates Per MG 7/1/2020 - 6/30/2021	Proposed (FY2022) Rates Per MG 7/1/2021 - 6/30/2022
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, 2020 to cover the operating expenses of the System for FY2021. The FY2022 O&M sales base of 182.339 million gallons per day (mgd) is slightly lower than the assumed sales base for FY2021 (182.353 mgd). The O&M Component is projected to remain the same for FY2022 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 FY2022 require that an O&M Component of $194.00 per million gallons be charged starting on July 1, 2021.

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. 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 $851,650 in FY2021, and the amount available in FY2022 will be $1,262,390. Overdraft sales increased from $201,653 in FY2021 to $312,394 in FY2022. An additional $950,000 in prior year positive budget variance is used in FY2022 to offset the O&M component. Without the use of any rate stabilization funds in FY2022, the required O&M Component of the rate would be an additional $18.97 per million

gallons, for a total of $212.97 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 FY2022. 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 Infrastructure Bank (NJIB) to finance the dredging of a 10.5-mile segment of the Delaware and Raritan Canal (D&R Canal) between Kingston at Lincoln Highway and Amwell Road in Franklin Township, Somerset County, New Jersey. The Authority has also submitted an application to the NJIB to finance the refurbishment of structures within the Round Valley Reservoir complex. The Authority proposes maintaining the NJIB 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 FY2022 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 FY2022.

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 FY2022.

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 8, 2021.

A public hearing on the proposed rate adjustments is scheduled at 10:00 a.m. on Friday, February 5, 2021.

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

The New Jersey Register Comment Period is scheduled to close on March 5, 2021 and the public hearing record on the proposed rate adjustments is scheduled to close on March 15, 2021.

Final action on the rate adjustment is scheduled for the Authority's May 3, 2021 meeting. The FY2022 rate will take effect on July 1, 2021.

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 FY2020 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 FY2022 budget based on the FY2020 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 FY2022 Raritan Basin System Operating Expense Budget is increasing by $361,578 from FY2021. 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 $14,303,336. This is $390,778 more than the FY2021 budget of $13,912,557 and results from an increase in operations and maintenance expenses and expected capital equipment purchases. The Capital Equipment budget of $368,900 is $74,200 more than the FY2021 budget of $294,700. 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 FY2021 levels. There are no contributions scheduled for the Depreciation Reserve and the Self-Insurance Reserve in FY2022. 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. The reserve balance is currently approximately $247,000. All of these modifications result in a total FY2022 budget requirement of $14,303,336 which is an increase of 2.8 percent relative to FY2021 (Page 15).

Sixteen of the thirty-one FY2022 direct operating expense accounts are projected to increase, but only four accounts by $5,000 or more relative to FY2021. Nine of the operating expense accounts are projected to decrease relative to FY2021. The most significant projected increases in the budget occur in the Protective Services (insurance) and Service and Maintenance Contract categories, while the most significant projected decreases in the budget occur in Printing and Office Supplies and Heating Fuel categories. In Salary and Fringe, regular salary is increasing by $164,850. Fringe benefits for active employees are increasing by 6.5 percent due assumed increases in the cost of health benefits and pensions. Retiree health benefits are increasing by $4,500 and assume 4 additional retirees between FY2021 and FY2022. Salaries and benefits constitute approximately 75.3 percent of the FY2022 operating budget, and are increasing approximately 3.4 percent relative to FY2021.

Salaries and Benefits

Authority employees within the Communications Workers of America (CWA), the International Federation of Professional Technical Engineers (IFPTE), and the International Brotherhood of Electrical Workers (IBEW) are currently operating under a contract that expires on June 30, 2023. The FY2022 budget assumes a 2.0 percent cost of living adjustment payable in July of 2021 and another 2.0 percent cost of living adjustment payable in December of 2021 which was deferred from July of 2020 through the 2020 COVID State Emergency Memorandum of Agreement Between the Communications Workers of America and the State of New Jersey and subsequently by agreement with the other unions. 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 FY2022 budget for management. The Authority is budgeting 48 percent of the Salary budget for fringe benefits in FY2022, exclusive of retiree medical.

Pension expense payable to the state of New Jersey on April 1, 2021 is expected to be approximately $800,000 for the Raritan System. The Authority has budgeted $991,100 for this line item in FY2022. The average increase in actual payments to Treasury for pension contributions since FY2017 is 3.7 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 decrease by $14,715 from $269,270 to $254,555 in FY2022. 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 increasing the retiree health benefits expense item in FY2022 by $4,500. The Authority is budgeting four additional retirees in FY2022. The Centers for Medicare and Medicaid Services (CMS) estimates that national health care spending will increase at an annual rate of 5.7% from 2018-2027. The Authority used actual 2020 rates and budgeted 5.7 percent and 5.7 percent increases for calendar years 2021 and 2022, respectively. The budget contains sufficient funds for 62 retired employees.

Insurance Program

The Authority is recommending an increase in insurance expense for FY2022 reflecting general market conditions and based on the advice of the Authority's insurance broker and consultant. Broker services are remarketed every three years and the insurance program is renewed on March 1. The Authority has included a $27,516 increase in the insurance line item for FY2022 which is a 2.2% increase versus budgeted FY2021.

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 FY2022 are $32,600 based upon a rate of .5 percent for short-term investments. This represents a decrease of $48,800 from $81,400 in FY2021. (Schedule 7, page 25), reflecting overall market reductions in interest rates.

Reserve Contributions

During FY2022, the Authority will make no contribution to the Depreciation Reserve. The Depreciation Reserve is fully funded in FY2022 (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 FY2022. 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 Infrastructure Bank (NJIB) 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 $45,000,000 and last in duration up to four years. Funding through the NJIB would allow a portion of the loan to be at zero interest and a portion of the loan to be at market rate with the blended rate at favorable terms. 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 several years. The Authority has also submitted an application to the NJIB to finance the refurbishment of structures at the Round Valley Reservoir complex in Clinton Township, Hunterdon County, New Jersey. This project is expected to cost approximately $75,000,000 and last in duration for several years. Funding through the NJIB would allow a portion of the loan to be at zero interest and a portion of the loan to be at market rate with the blended rate at favorable terms. Interim loans for the project closed in June 2019 and July 2020. The Authority proposes maintaining the rate component of $85.00 per million gallons in FY2022 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 necessary annual investment between $2,500,000 and $5,500,000. In evaluating options for financing this program (and subsequent five year CIP's) the Authority looked at (1) the continuation of the practice of incurring long-term debt through the issuance of Revenue Bonds and (2) the possibility of current financing through the assessment of annual charges as part of our rate structures. The Authority concluded at the time that financing of such a small annual Capital Improvement Program based upon the issuance of long-term debt was fiscally imprudent. The Authority reevaluates this financing methodology on an annual basis.

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

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

For FY2022, 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 FY2021, should be assessed for FY2022 to generate approximately $2,196,273. The Authority deems these revenues sufficient to meet its capital needs for FY2022 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.

Source Water Protection Fund Component for the Protection of Water Quality

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

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

In light of the rapid decline in available watershed parcels, and the critical value of these parcels to the sustained supply of water in the Raritan Basin System, the Authority increased the Source Water Protection Fund by $5.00 per million gallons in FY2004 and again by $3.00 per million gallons in FY2006, to acquire fee and other interests in critical watershed parcels in the System and rehabilitate properties to maximize benefit to water quality and quantity. To date, more than 3,954 acres of property have been preserved by the Authority and its partners. Some of the watershed and water quality projects include a tributary and storm water assessment of the D&R Canal to determine sediment loading, followed by an implementation project; the development of storm water management plans for a variety of tributaries in the Basin; a stream restoration project of a reach of the Mulhockaway which feeds into Spruce Run, and implementation of improved land management practices within the agricultural community. The Authority increased the Source Water Protection Rate from $13.00 per million gallons to $15.00 per million gallons in FY2008 to further support direct watershed protection and restoration projects. The Authority increased the Source Water Protection Rate from $15.00 per million gallons to $24.00 per million gallons in FY2014 to support debt service on previously acquired critical watershed parcels. The Authority is proposing no change to this component of the Rate in FY2022.

Other Rule Amendments

There are no other rule amendments. The language supporting the overall proposal is contained beginning on page 65 of this document.

PART II – DETAILED SUPPORTING INFORMATION

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Table 1 - Summary Of Proposed Fiscal Year 2022 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 11/02/20	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 2006 – Fiscal Year 2022

Effective Date	O&M Charge	1981 Bond Charge 7/1/86-10/30/06	1998 Bond Charge 8/1/98-11/1/13	NJEIFP/NJIB Debt Component	Capital Fund Component	Source Water Protection Component	Total Charge per MG	Percent Increase -Decrease
July 1, 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%
July 1, 2020	194.00			85.00	33.00	24.00	336.00	0.00%
July 1, 2021	194.00			85.00	33.00	24.00	336.00	0.00%

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYTEM

Schedule Of Events
(NJAC 7:11-2.1 et. seq.)
To become effective July 1, 2021

2020

SEPTEMBER	28	Advise Water Users of informal meeting.
OCTOBER	30	Informal meeting with Water Users – 10:00 AM.
NOVEMBER	2	Board reviews and approves proposed Rates.
DECEMBER	18	Mail Official Notice to water customers, Rate Payer Advocate, interested parties and advertise in newspapers.

2021

JANUARY	4	Publication in the New Jersey Register.
	8	Pre-Pubic Hearing – 10:00 AM (within 45 days of Official Notice). Deadline for responses to inquires received prior to pre-public hearing.
FEBRUARY	1	Deadline for receipt of comments to be addressed at Public Hearing (15 days after pre-public hearing).
	5	Public Hearing Meeting. (SR Administration Building) – 10:00 AM Deadline for responses to inquires received between pre-public and public hearing.
	22	Written responses to questions raised at Hearing (within 10 business days of the public hearing).
MARCH	5	NJ Register Comment Period Ends.
	15	Public Hearing record closes (25 business days after Public Hearing).
MAY	3	Board approval of FY2022 Rates & Budgets
JULY	1	Effective date.

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Proposed

Fiscal Year 2022 Budget Summary
(7/1/21 - 6/30/22)

	ADOPTED F/Y21	PROPOSED F/Y22
Proposed Operating Expense Budget (Schedule 1)	$ 13,936,857	$ 14,298,436
Net Allocation of Headquarters General and Administrative Expenses to the Manasquan Water Supply System - (Schedule 5)	$ (629,000)	$ (674,000)
Proposed Total Expense Budget	$ 13,307,857	$ 13,624,436
Proposed Capital Equipment Budget (Schedule 6)	$ 294,700	$ 368,900
Total Operating Expense & Capital Equipment Budgets	$ 13,602,557	$ 13,993,336
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	$ 13,912,557	$ 14,303,336
MISCELLANEOUS REVENUES:		
Employee Housing/Land Rental	$ (47,200)	$ (47,200)
Receivable from the State of NJ and Other Reservoir Sites	$ (5,000)	$ -
Interest Earnings on Funds (Except Major Rehabilitation and Depreciation Reserve Fund) (Schedule 7)	$ (81,400)	$ (32,600)
	$ (133,600)	$ (79,800)
OTHER AVAILABLE FUNDS:		
Unanticipated Revenue (Schedule 8)	$ (851,650)	$ (1,262,390)
Total Other Available Funds	$ (851,650)	$ (1,262,390)
Net Amount to be paid for O & M Component	$ 12,927,307	$ 12,961,146

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 1 - Proposed Operating Expenses Budget – Fiscal Year 2022 Distributed by Cost Center

Fiscal Year 2022

CODE	ACCOUNT	OFFICE EXECUTIVE DIRECTOR	FINANCIAL MANAGEMENT & ACCOUNTING	WATERSHED PROTECTION PROGRAMS	OPERATIONS MAINTENANCE & ENGINEERING	PROPOSED BUDGET FOR FY22
5110	Regular Salaries & Wages	$150,000	$1,854,350	$684,300	$3,951,850	$6,640,500
5120	Overtime-Salaries & Wages	0	125,975	0	128,580	254,555
5130	New Positions-Salaries & Wages	0	0	0	0	0
5140	Seasonal Help-Salaries & Wages	0	0	0	0	0
5150	Fringe Benefits	54,500	827,800	263,000	2,177,500	3,322,800
5167	Retiree Health Benefits	41,500	135,900	21,600	345,000	544,000
5168	Workers Compensation (Self-Insured)	0	10,000	0	0	10,000
	Total Salary & Fringe Benefits	$246,000	$2,954,025	$968,900	$6,602,930	$10,771,855
5200	On-Site Residences	$0	$0	$0	$19,600	$19,600
5210	Heating Fuel	0	0	0	80,250	80,250
5220	Utilities -Electrical Service	0	0	0	102,500	102,500
5230	" -Gas Service & Water	0	0	0	5,500	5,500
5240	" -Propane	0	0	0	500	500
5250	Electricity for Pumping	0	0	0	83,400	83,400
5260	Vehicular Fuel	0	109,688	0	0	109,688
5270	Oil & Grease	0	0	0	12,500	12,500
5280	Tires	0	0	0	25,000	25,000
5290	Maintenance Supplies	0	9,000	0	189,100	198,100
5300	Maint. Supplies - Vehicular Equipment	0	0	0	59,000	59,000
5310	Major Special Vehicle Service & Repair	0	0	0	85,000	85,000
5320	Agricultural Supplies	0	500	0	7,500	8,000
5330	Maintenance of Equipment	0	5,700	5,500	53,000	64,200
5340	Service & Maintenance Contracts	0	80,720	3,456	220,520	304,696
5350	Equipment Rental	0	23,350	0	42,300	65,650
5360	Household-Safety & Protective Supplies	100	25,100	0	15,400	40,600
5370	Uniforms	0	5,400	0	3,500	8,900
5380	Special & Professional Services	23,000	200,078	177,358	181,100	581,536
5390	Protective Services	0	1,278,616	0	0	1,278,616
5400	Telephone	0	81,000	0	7,200	88,200
5410	Postage & Freight	0	5,500	0	120	5,620
5420	Data Processing	0	27,420	0	0	27,420
5430	Printing & Office Supplies	1,000	32,850	3,000	8,700	45,550
5440	Scientific & Photographic	0	0	6,000	500	6,500
5450	Dues & Subscriptions	14,400	12,025	400	14,700	41,525
5460	Advertising	0	5,500	5,500	200	11,200
5470	Travel & Subsistence	1,500	2,080	1,500	1,600	6,680
5480	Staff Training & Tuition Aid	500	10,450	5,000	10,800	26,750
5490	Fees & Permits	0	112,100	0	13,100	125,200
5500	In-Lieu Taxes	0	8,700	0	0	8,700
	Total Operating Expenses	$40,500	$2,035,777	$207,714	$1,242,590	$3,526,581
	GRAND TOTAL	$286,500	$4,989,802	$1,176,614	$7,845,520	**$14,298,436**

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 1A - Comparative Statement

Fiscal Year 2022

ACCOUNT		FY'18 ACTUAL	FY'19 ACTUAL	FY'20 ACTUAL	FY'21 ADOPTED	FY'22 PROPOSED
Regular Salaries & Wages		$5,799,411	$5,959,265	$6,020,542	$6,475,650	$6,640,500
Overtime-Salaries & Wages		244,222	239,713	151,734	269,270	254,555
New positions-Salaries & Wages		0	0	0	0	0
Retiree Unused Sick & Vacation		0	0	0	0	0
Fringe Benefits		3,633,755	3,047,059	3,178,400	3,120,000	3,322,800
Retiree Health Benefits		821,473	1,498,763	(433,886)	539,500	544,000
Workers Comp. (Self Insured)		493	4,590	3,311	10,000	10,000
Total Salary & Fringe		10,499,354	10,749,390	8,920,101	10,414,420	10,771,855
Budget Salary & Fringe						
Residences		$17,161	$27,122	$18,485	$19,600	$19,600
Heating Fuel		67,502	61,012	47,955	93,500	80,250
Utilities -Electrical Service		98,336	93,556	98,579	102,900	102,500
-Gas Service		4,531	4,571	4,997	5,200	5,500
-Propane		403	457	219	500	500
Electricity for Pumping Station		328,769	59,993	55,878	87,000	83,400
Fuel - Vehicular		116,756	106,304	77,299	121,875	109,688
Oil & Grease		4,033	9,317	7,787	12,100	12,500
Tires		16,056	15,540	25,046	23,000	25,000
Maintenance Supplies		163,391	184,818	166,538	194,600	198,100
Maint. Supplies - Vehicular		61,576	50,108	46,362	57,500	59,000
Major Vehicle Service & Repair		47,127	103,843	68,448	85,000	85,000
Agricultural Supplies		2,317	5,758	5,004	7,000	8,000
Maintenance Equipment		37,388	28,372	43,132	50,900	64,200
Serv. & Maintenance Contracts		228,974	241,120	252,173	287,356	304,696
Equipment Rental		54,332	35,066	56,110	55,850	65,650
Household - Safety Supplies		34,163	39,576	35,372	39,500	40,600
Uniforms		3,213	9,581	6,233	8,660	8,900
Special & Professional Services		506,542	455,218	442,967	591,136	581,536
Protective Services		1,138,434	1,154,913	1,194,269	1,251,100	1,278,616
Telephone		78,449	75,123	58,899	85,200	88,200
Postage & Freight Out		5,718	6,285	3,005	5,620	5,620
Data Processing		35,453	25,995	24,451	27,420	27,420
Printing & Office Supplies		41,272	47,991	32,114	85,050	45,550
Scientific & Photographic		1,174	784	4,194	6,500	6,500
Dues & Subscriptions		35,117	36,715	35,716	42,220	41,525
Advertising & Promotional		5,219	1,966	10,156	11,500	11,200
Travel & Subsistence		3,841	5,433	4,080	6,580	6,680
Staff Training & Tuition Aid		12,460	14,222	15,140	25,450	26,750
Fees & Permits		111,609	118,400	117,155	123,920	125,200
In - Lieu Taxes		18,689	8,703	28,675	8,700	8,700
Total Other Expenses		$3,280,008	$3,027,860	$2,986,441	$3,522,437	$3,526,581
Total Operating Expenses		$13,779,362	$13,777,251	$11,906,541	$13,936,857	$14,298,436
Annual Increase (Decrease)		-5.29%	-0.02%	-13.59%	1.16%	2.59%
Budget -other expenses		3,411,337	3,540,285	3,540,285	3,522,437	3,522,437
ANNUAL BUDGET		$13,890,887	$14,238,081	$14,211,138	$13,936,857	$14,298,436

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

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

Fiscal Year 2022

		ADOPTED F/Y21	PROPOSED F/Y22
1.	Postage/Fax/ Misc. Machines (Dept. 16)	$ 500	$ 500
2.	IHS-Safety Software (Dept. 17)	2,000	2,000
3.	Comodo- Remote Access Certificates (Dept. 17)	300	300
4.	WMWARE (Dept. 17)	500	500
5.	Sage Clients First MAS 100 (Dept. 17)	5,000	5,300
6.	Property Fax - Parcel Maps (Dept. 17)	1,400	1,400
7.	Sage Fixed Asset (Dept. 17)	2,600	2,900
8.	PV & Associates-Winslamm (Dept. 17)	500	500
9.	People Trak Support Technical Difference (Dept. 17)	1,000	500
10.	COMCAST - Cable Internet (Dept. 17)	12,000	15,000
11.	Essention - Conservation Trak (Dept.17)	5,000	5,000
12.	Weebly (Web Hosting at Clinton) (Dept. 17)	200	250
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	1,500
16.	ESRI ArcView Maintenance-Watershed (Dept. 17)	5,400	5,400
17.	CU Riverware Maintenance Agreement (Dept. 17)	3,500	-
18.	KNOWBE4 Internet Security (Dept. 17)	-	1,500
19.	Proofpoint Antispam (Dept. 17)	1,500	1,500
20.	River Morph (Dept. 17)	500	500
21.	DLT Solutions Autocad (Dept. 17)	1,600	2,800
22.	Fastrax SBPS Monitoring Software (Dept. 17)	900	900
23.	ESRI ArcView Maintenance-Clinton (Dept. 17)	500	500
24.	Keystone Precision-GPS Software Maint. (Dept. 17)	800	800
25.	HAAS Systems-Security Alarm Software Maint. (Dept. 17)	400	400
26.	Clients First-Vipre Antivirus/Antispam (Dept. 17)	250	400
27.	EZ Watch Security Video (Dept. 17)	900	900
28.	Clients First - Server Software (Dept. 17)	1,000	1,000
29.	Delmar Enterprises - Key Systems (Dept. 17)	520	520
30.	Docusign (Dept. 17)	400	400
31.	Wix for Web (Dept. 20)	156	156
32.	Janitorial Service (Dept. 20)	3,300	3,300
33.	Trimble Catalyst for GPS (Dept. 30)	500	500
34.	Refuse Collection (Dept. 31)	7,500	7,500
35.	Janitorial Service (Dept. 31)	15,500	24,000
36.	HVAC Service (Dept. 31)	5,500	5,500
37.	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 2022

		ADOPTED F/Y21	PROPOSED F/Y22
38.	Instrumentation Services (Dept. 31)	$ 4,500	$ 4,500
39.	Entry Rugs (Dept. 31)	5,000	5,000
40.	Carpet Cleaning (Dept. 31)	8,000	8,000
41.	Generator Service-Administration Building (Dept. 31)	1,200	1,200
42.	Underground Plant Location Service Notifications (Dept. 31)	1,500	1,500
43.	Crane Service and Inspection (Dept. 31)	2,200	4,000
44.	Elevator Service-SBPS (Dept. 31)	2,800	2,800
45.	Electrical Service-SBPS (Dept. 31)	20,000	20,000
46.	UST Testing and Inspections (Dept. 31)	15,000	15,000
47.	Miscellaneous (Dept. 31)	6,900	6,900
48.	Janitorial Service (Dept. 32)	8,400	9,600
49.	Dumpster Service Canal Office (Dept. 32)	18,000	18,000
50.	Dumpster Service Route 1 (Dept. 32)	48,000	48,000
51.	UST Service (Dept. 32)	2,500	-
52.	Instrumentation Service (Dept. 32)	1,000	3,000
53.	One Call Concepts (Dept. 32)	-	2,400
54.	Floor Mats (Dept. 32)	2,400	2,400
55.	Grass Mowing Service (Dept. 32)	8,000	8,000
56.	Boiler Service (Dept. 32)	500	1,000
57.	Wood Disposal Fees (Dept. 32)	4,800	4,800
58.	Generator Service-Scudders & Perdicaris (Dept. 32)	3,000	3,000
59.	Viking Pest (Dept. 32)	600	720
60.	Johnny on the Spot - Rt. 202 (Dept. 32)	2,400	2,400
61.	Welco Gas (Dept. 33)	1,000	1,000
62.	Tree Stump Recycling (Dept. 33)	2,500	2,500
63.	Parts Washer & Hazardous Removal (Dept. 34)	1,000	1,000
64.	Boom Lift Annual Inspection (Dept. 34)	900	900
65.	Recycle Used Vehicle Fluids (Dept. 35)	1,500	400
66.	Fire Extinguisher Maintenance (Dept. 36)	9,000	9,000
67.	Hazardous Waste Control (Dept. 36)	1,500	1,500
68.	Fire Alarm Testing (Dept. 36)	8,000	8,000
69.	Vehicle Lifts Annual Testing (Dept. 36)	1,500	1,500
70.	Delaware Electric Cellular Service (Dept. 37)	600	800
71.	Dial My Calls (Dept. 37)	1,200	1,600
72.	Geomoto GPS Tracking (Dept. 37)	1,200	1,200
73.	Covert Wireless (Dept. 37)	180	1,200
	TOTAL	$ 287,356	$ 304,696

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 3 - List of Category 5380 Items Recommended Professional Services

Fiscal Year 2022

		ADOPTED F/Y21	PROPOSED F/Y22
1.	Services-Governor's Authorities Unit (Dept. 10)	$ 25,000	$ 23,000
2.	Consultant-C.P.A. to Conduct Annual Audit (Dept. 13)	55,000	55,000
3.	125 Plan-Family security Insurance Agency (Dept. 13)	2,730	2,730
4.	Archiving (Dept. 13)	6,000	6,000
5.	Services-Pre-Employment Exams & Tests (Dept. 14)	3,300	3,300
6.	Fidelifax-Background Checks (Dept. 14)	2,248	2,248
7.	Medical CDL Drug Testing (Dept. 14)	1,600	2,400
8.	Employee Advisory Service (Dept. 14)	2,500	2,500
9.	Consultant-Risk Management - to provide assistance to the Authority in the review of insurance coverage and continuation of a Comprehensive Coordinated Risk Management Program (Dept. 15)	45,000	45,000
10.	Insurance Broker-HRH (Dept. 15)	42,000	42,000
11.	GL Administrator (ESIS) (Dept. 15)	2,000	2,000
12.	Services-Attorney General's Office - Assistance of Deputy Attorney General concerning a wide range of legal matters (Dept. 15)	20,000	20,000
13.	Appraisals - Canal Leases	5,000	-
14.	MP Water Monitoring Costs - USGS SR @ Glen Gardner (Dept. 20)	10,057	10,057
15.	MP Water Monitoring Costs - USGS SB Raritan @ Stanton (Dept. 20)	8,568	8,568
16.	MP Water Monitoring Costs - USGS Landing Lane (Dept. 20)	36,414	36,414
17.	MP Water Monitoring Costs - USGS Raritan River @ Manville (Dept. 20)	47,940	47,940
18.	Continuous Record Gaging - USGS @ Washington Crossing (Dept. 20)	22,083	22,083
19.	Water Quality Monitoring - USGS @ Washington Crossing (Dept. 20)	5,059	5,059
20.	Water Monitoring Costs ASWQMN- USGS D&R Canal @ Landing Lane (Dept. 20)	13,617	13,617
21.	Water Monitoring Costs ASWQMN - NJDEP Mulhockaway @ Van Syckel (Dept. 20)	7,320	7,320
22.	Additional Flow Measure at SR, Stanton, Manville & Calco Dam (Dept. 20)	8,500	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 2022

		ADOPTED F/Y21	PROPOSED F/Y22
25.	Lab Certification WPU/Water Sample Analysis (Dept. 20)	$ 2,000	$ 2,000
26.	NJ Invasive Species Strike Team (Dept. 20)	300	300
27.	ISCO Monitoring (Dept. 20)	8,000	8,000
28.	General Lab Analysis	4,000	4,000
29.	Services-Emergency Engineering Services (Dept 30)	2,500	2,500
30.	Underground Storage Tank-CEA Report (Dept. 30)	16,000	-
31.	Underground Storage Tank Groundwater Test (Dept. 30)	6,000	-
32.	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
33.	USGS Spruce Run Gage at Glen Gardner (Dept. 31)	10,200	10,200
34.	USGS Clinton Rain Gage (Dept. 31)	3,200	3,200
35.	USGS Washington Crossing Rain Gage (Dept. 31)	3,200	3,200
36.	Water Testing and Sampling to comply with the Safe Water Drinking Act (Dept. 31)	2,400	5,000
37.	Water Sampling and Testing as per NJDWR Requirements - RT 202 Stockpile Site (Dept 32)	20,000	28,000
38.	Maintenance of USGS Gauges at Washington Crossing and 10-mile and others (Dept. 32)	48,000	56,000
39.	Vac Truck Service - IFW, 10 Mile PS (Dept. 32)	5,000	5,000
40.	Safety Suggestion Program, Poster and Promotional Materials, Safety Incentive Program (Dept. 36)	9,700	9,700
41.	Pulmonary Testing and Physicals (Dept. 36)	5,000	5,000
42.	Annual Contributions to Fire Companies and Rescue Squads (Dept. 36)	500	500
43.	Hepatitis Vaccinations (Dept. 36)	800	800
44.	Calibration for the Pota-Count Respirator (Dept. 36)	900	900
	TOTAL	$ 591,136	$ 581,536

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 4 - Projected FY 2022 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 Earthen Dam:Builders Risk	$581,916	$254,075	$75,585	$911,576
General/Products Liability Limit $1 million Deduct: $150k	$121,481	$11,358	$2,359	$135,198
Environmental Impairment Liability Limit $10 million Deduct: $100k	$24,261	$2,268	$471	$27,000
Workers' Compensation Limit $1 million	$153,012	$22,554	$24,434	$200,000
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	$319,971	$29,915	$6,211	$356,098
Business Automobile Limit: $1 million G/L, $0 pd Deduct: $50k, G/L	$27,363	$3,662	$1,240	$32,264
Management Liability				
Public Officials Liability	$43,553	$4,072	$845	$48,470
Cyber Risk	$6,386	$597	$124	$7,107
Fidelity & Crime			$2,453	$2,453
Limit $5 million/$1million/$1 million Deduct: $100k/$10k/$50k	$49,939	$4,669	$3,422	$58,031
Travel Accident Limit $2 million	$674	$63	$13	$750
TOTAL:	$1,278,616	$328,564	$113,736	$1,720,916

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 2022 (7/1/21-6/30/22)

	Total Headquarters Charge	Manasquan Reservoir System	Manasquan WTP/TS
Budgeted-Appendix I, amount to be charged to Manasquan System for FY22 (7/1/21-6/30/22)	$732,719	$632,117	$100,602
F/Y20 Adjustment as per audited Expenditures:			
Budgeted as per rate schedule for F/Y20 (7/1/19-6/30/20). Amounts paid during F/Y20 to Raritan Basin System.	$660,000	$568,000	$92,000
Actual allocation based upon audited expenditures F/Y20 (7/1/19-6/30/20) - Appendix II	$601,323	$518,747	$82,576
Adjustments F/Y20	($58,677)	($49,253)	($9,424)
Net Allocation for F/Y2022 Budget	$674,042	$582,864	$91,178
Estimate	$674,000	$583,000	$92,000

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 6 - Proposed Capital Equipment Budget

Fiscal Year 2022

	Description	(R) Replacement (A) Addition	Year of Purchase	Dollar Value	Depreciation Reserve
ENG/FACILITIES	HONDA 3" GAS POWERED PUMP	A		2,000	
	6" DIESEL POWERED PUMP	A		50,000	
	CORDLESS ROTARY HAMMER	A		2,500	
	1/2 TON PICKUP	A		35,000	
	CARPENTER SHOP AIR FILTER	A		2,750	
GROUNDS	7 TON DECK OVER TRAILER	A		10,000	
	POWER TRAC SLOPE MOWER PT1850	A		45,000	
	90" DECK FOR POWER TRAC W/ FINISHING KIT	A		7,000	
	POST HOLE DRILL HEAD FOR POWERTRAC T3359	A		3,750	
	4x4 FRONT MOUNT MOWER W/DECK	R (2202)	2012	30,000	20,967
	4x4 FRONT MOUNT MOWER W/DECK	R (2211)	2012	30,000	21,407
	4x4 FRONT MOUNT MOWER W/DECK	R (2212)	2012	30,000	15,467
	FULL SIZE WHEEL LOADER	R (2050)	2007	215,000	118,850
	MASON DUMP TRUCK W/PLOW & SPREADER	R (2085)	2008	70,000	89,063
	ATTACHMENT KIT FOR JOHN DEERE SNOW BLOWER	A		5,000	
CANAL	20 TON TRAILER	R (2149)	2010	25,000	15,400
	CHIPPER - DRUM STYLE	R (1975)	2005	65,000	31,189
	TRACTOR W/ ARM MOWER			157,000	
	F-250	R (2239)	2014	42,000	25,862
AUTO SHOP - CANAL	AUTO SHOP LIFT (12,000 LB CAPACITY)	R (1381)	1993	10,000	5,500
	TURF LIFT ACCESSORY KIT FOR NEW LIFT	A		3,500	
	DUAL GAS REFRIGERANT A/C MACHINE	R (1934)	2004	10,000	3,293
	MILLER 252 MIG WELDER	R (1291)	1992	3,500	2,666
IT	(2) DELL OPTIPLEX - IT	R (2250) (2251)	2015	3,600	2,814
	DELL OPTIPLEX - ENG	A		1,800	
SECURITY	NJWA 03 - 4WD PICK-UP	R (2235)	2014	32,000	20,057

	TOTAL COST	$891,400	$372,535
LESS AMOUNT CHARGED TO DEPRECIATION RESERVE		(372,535)	
	NET TOTAL	$518,865	
LESS AMOUNT CHARGED TO CAPITAL EQUIPMENT RESERVE		($150,000)	
	TOTAL	$368,865	
	AMOUNT FUNDED FOR FY2022	**$368,900**	

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 7 - Estimate Of Interest Income For Fiscal Year 2022 Budget

Fund/Reserve	TD Bank Funds
Operating	$ 2,295,000
Reserve for O & M	2,265,000
Pumping Reserve	1,565,000
Self-Insurance Reserve	300,000
Rate Stabilization Fund	87,000
Estimated Total	$ 6,512,000

$6,512,000	x .5% =	$ 32,560
	Total	$ 32,560
	Estimate	$ 32,600

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 2022

				Amount
F/Y2020 Net Year-End Balance				$950,000
Overdrafts	Invoice No.	Billed	Amount	
Hunterdon County -Heron Glen	R276	Nov-19	$107	
NJ American	R274	Nov-19	$91,046	
Roxiticus	R279	Nov-19	$466	
Somerset County Golf	R277	Nov-19	$200	
Stonebridge Community Assoc.	R275	Nov-19	$2,031	
Trump GC	R280	Nov-19	$1,449	
Village Grande	R278	Nov-19	$521	
Mount Olive		Sep-20	$9	
Mount Olive		Sep-20	$110	
Mount Olive		Sep-20	$146	
NJ American		Sep-20	$40,167	
NJ American		Sep-20	$175,541	
Stonebridge Community Assoc.		Sep-20	$27	
Roxbury		Sep-20	$110	
Somerset County Golf		Sep-20	$465	
		Total	$312,394	
	Amount used in FY2021		-	
		NET		$312,394

Overdrafts Not Billed, Accrued through July, 2020

Renaissance at Monroe

NJ American

Other Sources of Funds

Grand Total	$1,262,394
FY22 Budget	$1,262,390

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 9 - Fund Balances as of 6/30/20

Final

	REVENUE FUND	OPERATING ACCOUNT	OPERATING FUND	O & M RESERVE	LONG-TERM INVESTMENTS O & M RESERVE	TOTAL
BALANCE 6/30/20	$1,851,056	$1,133,998	$3,102,919	$3,250,814	$340,508	$9,679,295
Deduct: Accrued expenses to be paid as of 6/30/20			5,253,941			5,253,941
Deduct: June 1st billing, received			(6,183,420)			(6,183,420)
Adjusted Balances 6/30/20	$1,851,056	$1,133,998	$2,173,440	$3,250,814	$340,508	$8,749,816
INCOME						
Reimbursement Manasquan Receipt of Headquarters Overhead Expenses for 7/10/20			165,001			165,001
Operating transfer	($1,851,056)	($1,133,998)	2,985,054			-
EXPENSES						
O & M Expenses - (A/P 6/30/20) Includes accrued Payroll thru 6/30/20			(235,939)			(235,939)
Capital items to be purchased by 6/30/20			(182,263)			(182,263)
Various Reserve contributions (one month)			-			-
PROJECTED BALANCE AT 6/30/20	$0	$0	$4,905,293	$3,250,814	$340,508	$8,496,615

Less: O & M reserve balance (3 mos required by resolution)	(3,557,889)
Adjusted balance of funds available 6/30/21	4,938,726
Use of Available Funds	
Unanticipated revenues (overdrafts in FY20 to be available for appropriation to Rate Stabilization Fund for FY22)	(312,394)
Rate Stabilization Fund Transfer for FY21	(851,650)
Projected Net Balance	**$3,774,682**

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 10 - Projected Fiscal Year 2022 Operations & Maintenance Component and Debt Service Assessment Sales Base

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

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 10 (Cont.) - Projected Fiscal Year 2022 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
			TOTAL SALES BASE	**182.339**

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 11 - Operations And Maintenance Rate Component
Fiscal Year 2022

Funds Required for FY2022 Budget

Proposed Operating Expense and Capital Budget	$14,303,336
Less Miscellaneous Revenues & Interest Income	($79,800)
Other Available Funds	($1,262,390)
Net Budget Requirement	$12,961,146
Less: 182.339 x 194.00 x 61Days (Cash received in July and August for water used in May and June based on $194.00/mg)	($2,157,800)
Additional Revenue required to cover Operations and Maintenance Expense through 6/30/22	$10,803,346

Computation of Operations & Maintentance Rate for Fiscal Year 2022

Sales Base
Period 7/1/21 to 4/30/22 305 days x 182.339 mgd = 55,613.40 mg

Required Operations & Maintenance Rate FY2022

$$\frac{\$10,803,346 \text{ mg}}{55,613.40 \text{ mg}} = \$194.00 \text{ mg}$$

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 12 - Debt Service Rate Component For NJEIFP Loan Repayment

Debt Service Rate Component for NJIB Loan Repayment

Effective July 1, 2021 (FY2022, July 1, 2021-June 30, 2022)

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

$$\text{Debt Service Rate for NJIB Loan} = \frac{\$5,692,172}{182.339\text{mgd} \times 365 \text{ days}} = \$85.00 \text{ /mg}$$

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

NEW JERSEY WATER SUPPLY AUTHORITY
RARITAN BASIN SYSTEM

Schedule 13 - Capital Improvement Program

Fiscal Years 2021-2024

PROJECT	ESTIMATED PROJECT COST	Period First Identified	Priority	Prior Years	$33 FY 2021	$33 FY 2022	$40 FY 2023	$40 FY 2024	$40 FY 2025
Dredging Kingston & Amwell Road - Design Eng'g only (some is bonded)	$ 2,261,712	2006	High	2,134,133	$ 127,579				
Dredging Kingston & Amwell Road - Construction Engineering only (bond)	$ 25,000	2006	High	-	$ 25,000				
Dredging Kingston & Amwell Road - Construction $41M (bond)	$ -	2006	High	-					
Rehabilitate Western Embankment Stockton Borough	$ 4,000,000	2006	High	385,119	$ 1,000,000	$ 2,614,881			
Rehab Swan Creek Aqueduct New Project Includes Culvert Work	$ 1,200,000	2015	High	-			$ 100,000	$ 1,100,000	
Dam Impmnts as Recommended by TRB (Preliminary Eng'g and Owner's Eng'r)	$ 2,700,000	2013	High	2,361,777	$ 175,000	$ 163,223	$ -		
RV Res Dams-Rehab & Resource Preservation Project (eng only)	$ 5,900,000	2015	High						
Round Valley Dam Improvements - Construction (bond)	$ 65,000,000	2015	High	-					
Construction Eng'g Mgmt for RV Dam Improvements (bond)	$ 7,500,000	2015	High	-					
Grouting Abutments of RV Embankments (bond)	$ 4,700,000	2016	High						
Dredging Intake Channel to RV South Dam Tower (bond)	$ 1,100,000	2016	High						
Electrical Improvements at Round Valley Reservoir (Not bonded)	$ 150,000		High	$ 61,731	$ 88,269				
Security Improvements at RV Reservoir (Cameras) (Not bonded)	$ 1,200,000	2016	High	-		$ 300,000	$ 900,000		
Security Improvements at RV and SR (Perimeter hardening) (Not bonded)	$ 800,000	2017	High	-		$ 150,000	$ 150,000	$ 250,000	$ 250,000
Background Screening of Contractors and Consultants (Not bonded)	$ 202,252		High		$ 67,417	$ 67,417	$ 67,417		
New 2D Inundation Mapping for Round Valley and Spruce Run Reservoir	$ 500,000	2015	High	-			$ 250,000	$ 250,000	
Dredging of Intake Pond and Replace Ice Deflectors at SBPS	$ 4,011,500	2005	High	890,304	$ 3,121,196				
Rehab of 6-Mile Run Culvert	$ 1,500,000	2008	High	121,214	$ 300,000	$ 1,078,786			
Replace Fuel Dispenser and Software/inventory System at Spruce Run Adm.	$ 250,000	2017	High	64,463	$ 185,537				
Replace Office Phone System - Authority Wide	$ 75,000	2017	High	-	$ 75,000				
Refurbishment of the Main Pumps & Motors 4, 5, 7, & 8 with additional upgrades ~~(bond)~~	$ 6,000,000	2008	High	-	$ 3,000,000	$ 3,000,000			
Replace Boilers at Spruce Run Administration Building	$ 175,000	2018	High			$ 75,000	$ 100,000		
Replace Water Storage Tanks in Spruce Run Administration Building Basement	$ 100,000	2018	High		$ 100,000				
Emergency Generator at Spruce Run Administration Building	$ 400,000	2019	High			$ 200,000	$ 200,000		
SR Reservoir Multidisciplinary Release Works Improvements & Studies	$ 4,000,000	2016	High	149,974	$ 1,000,000	$ 1,500,000	$ 1,350,026		
Wastegate and Lock Evaluation and Repair - D&R Canal	$ 600,000	2020	High		$ 150,000	$ 150,000	$ 150,000	$ 150,000	
	$ 109,750,464								
Scudder Falls Wastegate Controls Improvement	$ 75,000	2019	Med High				$ 75,000		
Rehab of Upper Canal Embankment - Raven Rock to Prallsville	$ 4,800,000	2006	Med High	105,419	$ 400,000	$ 1,500,000	$ 1,500,000	$ 1,294,581	
Rehabilitate Flow Control Gate on Back Race at Lambertville	$ 150,000	2019	Med High			75000	$ 75,000		
Rehab of Canal Flow Control Structures	$ 1,500,000	2000	Med High	347,564				$ 100,000	$ 1,052,436
Rehab of Landing Lane Spillway and Rehab Slope Downstream of Island Farm Weir	$ 1,850,000	2013	Med High	201,625	$ 350,000	$ 1,298,375			
Repair of Pipe at Whitehead Road	$ 500,000	2012	Med High	-			$ 250,000	$ 250,000	
Rehabilitation Work at Washington Crossing Spillway	$ 300,000	2012	Med High	-				$ 150,000	$ 150,000
Security System and Upgrades (Clinton and Canal)	$ 450,000	2003	Med High	460	$ 100,000	$ 100,000	$ 50,000	$ 50,000	$ 149,540
Rooftop Hydronic Heater for Auto Shop - Spruce Run Admin.	$ 50,000	2020	Med High		$ 50,000				
	$ 9,550,000								
Alexauken Creek Aqueduct	$ 1,000,000	2015	Medium					$ 500,000	$ 500,000
Rehabilitation of Carnegie Lake Creek Aqueduct	$ 100,000	2015	Medium	43,400	$ 56,600				
Replacement of Through the Wall HVAC Units in SRA	$ 175,000	2011	Medium	373	$ 174,627				
Rebuild Stone Embankment at the 10 Mile Waste Gate and Rebuild Façade	$ 200,000	1990	Medium			$ 100,000	$ 100,000		
Rehab of Spillway Upstream of Griggstown Lock	$ -	2010	Medium						
Rehab of Culvert at Station 2550+90 (1 mile upstream of 10-mile)	$ 700,000	2008	Medium						$ 700,000
Replace Boiler at Canal Field Office	$ 150,000	2019	Medium			$ 150,000			
Replace Underground Heating Oil Tank at South Branch Pumping Station	$ 300,000	2018	Medium					$ 300,000	
Replace Underground Heating Oil Tank at SR Admin Building	$ 300,000	2019	Medium					$ 300,000	
Replace Underground Diesel and Gasoline Tanks at Spruce Run Admin Building	$ 600,000	2019	Medium					$ 600,000	
Spruce Run Administration Building Network Data Closet Construction	$ 100,000	2019	Medium			$ 100,000			
Replace Heaters at Langenfelder Maintenance Building		2020	Medium						
	$ 3,625,000								
Rehab of Traprock Spillway	$ -	2010	Low						
Dredging between Landing Lane and Route 18 - Engineering	$ -	2007	Low						
Dredging of Canal Between Lambertville and Route 1	$ -	2015	Low						
Dredging of Canal Between Amwell Road and 10 Mile	$ -	2015	Low						
Storage Building at Canal Field Office	$ -	2019	Low						
Spruce Run Administration Building Tie-in to Public Water Supply	$ -	2018	Low						
Storage Building near Spruce Run Annex	$ -	2018	Low						
Construction Bedload Stone Trap @ Wickecheoke Creek	$ -	1995	Low						
Cutoff Wall in Shipetaukin Creek Guard Bank	$ -	2005	Low						
Wickecheoke Creek Gates Abandonment	$ -	2015	Low						
Rehab of Gold Run Spillway	$ -	2008	Low						
Carnegie Lake Culverts Investigation / Isolation	$ -	2015	Low						
Raven Rock Retaining Wall Downcanal of Lock	$ -	2015	Low						
Refurbishment of the Main Pumps & Motors 3 & 9	$ -	2015	Low						
Refurbishment of the Main Pumps & Motors 2 & 10	$ -	2015	Low						
Canal Culvert Rehabilitation 2249+79 (Suydam)	$ -	2015	Low						
Canal Culvert Rehabilitation 2661+86 (Randolph Brook)	$ -	2015	Low						
Canal Culvert Rehabilitation 2992+34 (Mile Run Culvert)	$ -	2015	Low						
Concrete Repairs at the Sullivan Way Aqueduct	$ -	2007	Low						
Rehab of the Four Mile Spillway	$ -	2010	Low						
Third Hand Shop Culvert under D&R Canal Cleaning (partially Clogged)	$ -	2019	Low						
No-Name Culvert Under Canal Sta. 936+50 Outlet Cleaning (Part Clogged)	$ -	2019	Low						
Pipeline Evaluation - Whitehouse Release Pipeline	$ -	1990's	Low						
Pipeline Evaluation - RV Force Main	$ -	1990's	Low						
	$ -								
TOTAL	**$ 40,648,488**		**-**	**6,867,556**	**10,546,225**	**12,622,682**	**5,317,443**	**5,294,581**	**2,801,976**
Balance CIP				**24,272,311**	**15,922,528**	**5,502,305**	**2,847,216**	**214,988**	**75,366**

The estimated project costs listed includes engineering, cultural, construction and miscellaneous expenses.
Funds in CIP as of June 2020 is $13,989,861 plus $1,250,000 from Capital Improvements Investments & post 6/30/20 NJIB Reimbursements for 2020 work
Cost for the Dredging of the Canal between Kingston & Amwell Road of $41,000,000 represents construction costs.
Spruce Run Improvements - An extensive improvement program including grouting and spillway repair is anticipated on an approximate 4-year timeline.

RARITAN BASIN SYSTEM
CAPITAL IMPROVEMENT PROGRAM
Fiscal Years 2022 – 2025
Updated – August 2020

The following is a description of projects that the Authority anticipates being funded from the Capital Improvement Program (CIP) in Fiscal Years 2021 – 2025. Discussion also includes projects that may be delayed beyond FY 2025 due to funding.

HIGH PRIORITY
Dredging Kingston & Amwell Road - Design Eng'g only (some is bonded)
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 (prelim. eng'r and owner's eng'r)
RV Res Dams-Rehab & Resource Preservation Project (eng only)
Round Valley Dam Improvements - Construction (bond)
Construction Eng'g Mgmt for RV Dam Improvements (bond)
Grouting Abutments of RV Embankments (bond)
Dredging Intake Channel to RV South Dam Tower (bond)
Electrical Improvements at Round Valley Reservoir (Not bonded)
Security Improvements at RV Reservoir (Cameras) (Not bonded)
Security Improvements at RV and SR (Perimeter hardening) (Not bonded)
Background Screening of Contractors and Consultants (Not bonded)
New 2D Inundation Mapping for Round Valley and Spruce Run Reservoir
Dredging of Intake Pond and Replace Ice Deflectors at SBPS
Rehab of 6-Mile Run Culvert
Replace Fuel Dispenser and Software/inventory System at Spruce Run Adm.
Replace Office Phone System - Authority Wide
Refurbishment of Pumps & Motors Nos. 4, 5, 7, & 8 with Add'l Upgrades
Replace Boilers at Spruce Run Administration Building
Replace Water Storage Tanks in Spruce Run Administration Building Basement
Emergency Generator at Spruce Run Administration Building
SR Reservoir Multidisciplinary Release Works Improvements & Studies
Wastegate and Lock Evaluation and Repair - D&R Canal
MEDIUM / HIGH PRIORITY
Scudder Falls Wastegate Controls Improvement
Rehab of Upper Canal Embankment - Raven Rock to Prallsville

Rehabilitate Flow Control Gate on back Race at Lambertville
Rehab of Canal Flow Control Structures
Rehab of Landing Lane Spillway and Rehab Slope D/S of Island Farm Weir
Repair of Pipe at Whitehead Road
Rehabilitation Work at Washington Crossing Spillway
Security System and Upgrades (Clinton and Canal)
Rooftop Hydronic Heater for Auto Shop - Spruce Run Admin. Building
MEDIUM PRIORITY
Alexauken Creek Aqueduct
Rehabilitation of Carnegie Lake Creek Aqueduct
Replacement of Through the Wall HVAC Units in SRA
Rebuild Stone Embankment at the 10 Mile Waste Gate and Rebuild Façade
Rehab of Spillway Upstream of Griggstown Lock
Rehab of Culvert at Station 2550+90 (1 mile upstream of 10-mile)
Replace Boiler at Canal Field Office
Replace Underground Heating Oil Tank at South Branch Pumping Station
Replace Underground Heating Oil Tank at SR Ad Building
Replace Underground Diesel and Gasoline Tanks at Spruce Run Ad Building
Spruce Run Administration Building Network Data Closet Construction
Replace Heater at Langenfelder Maintenance Building
LOW PRIORITY
Rehab of Traprock Spillway
Dredging between Landing Lane and Route 18 - engineering
Dredging of Canal Between Lambertville and Route 1
Dredging of Canal Between Amwell Road and 10 Mile
Storage Building at Canal Field Office
Spruce Run Administration Building Tie-in to Public Water Supply - Consideration
Storage Building near Spruce Run Annex
Construction Bedload Stone Trap @ Wickecheoke Creek
Cutoff Wall in Shipetaukin Creek Guard Bank
Wickecheoke Creek Gates Abandonment
Rehab of Gold Run Spillway
Carnegie Lake Culverts Investigation / Isolation
Raven Rock retaining wall downcanal of Lock
Refurbishment of the Main Pumps & Motors 3 & 9
Refurbishment of the Main Pumps & Motors 2 & 10
Canal Culvert Rehabilitation 2249+79 (Suydam)
Canal Culvert Rehabilitation 2661+86 (Randolph Brook)
Canal Culvert Rehabilitation 2992+34 (Mile Run Culvert)

Concrete Repairs at the Sullivan Way Aqueduct
Rehab of the Four Mile Spillway
Third Hand Shop Culvert under D&R Canal Cleaning (Partially Clogged)
No-Name Culvert Under Canal Sta. 936+50 Outlet Cleaning (Partially Clogged)
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 was 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: 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 had accumulated in the Canal and needed to be removed and properly disposed.

Additionally, the US Route 202 sediment stockpile site in Delaware Township, Hunterdon County (just north of Lambertville) has reached 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 was included as part of this 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.

The project is ongoing and expected to be completed in FY21. The application for funding through the New Jersey Infrastructure Bank (NJIB), 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.

Three seasons of dredging are anticipated to complete this very important project. Guidelines for material acceptance at a beneficial reuse site and appropriate testing protocols were agreed upon by all parties including the owner of the site, NJDEP and the Environmental Protection Agency.

Dredging in the first season started in July 2018. Dredging was completed in Reaches 1, 2 and 4 in the first season of dredging. After drying and amending and mixing cement with the soil, approximately 50,000 cubic yards of dewatered sediment was transported to the beneficial reuse site. The second dredging season was completed in October 2019 and included Reach 3 and the majority of Reach 5. Approximately 46,700 cubic yards of sediment were removed from the stockpile site near Route 202 in Delaware Township. Approximately 41,000 cubic yards of sediment were dredged from Reach 3 and approximately 42,000 cubic yards of sediment were dredged from Reach 5. All dredged material, including the Route 202 stockpile, was taken to the beneficial reuse site. The contractor plans to dredge the remainder of Reach 5 and all of Reach 6 in 2020 and complete transport of the dredged material to the beneficial reuse site in 2021.

Rehabilitation of the Canal Western Embankment, Stockton Borough

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

Emergency actions were taken to prevent a breach of the embankment following the storms in 2011. These emergency actions included placement of fill material onto the embankment with

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

A professional engineering services contract was awarded in March 2014 to a team led by TranSystems. Hunter Research was selected as the Cultural Resource consultant for the project. A Schematic Design report was prepared and the chosen design will include restoration of all Canal-side slopes that were damaged during Tropical Storms Irene and Lee. The tarps that were placed over those areas will be removed, the erosion will be repaired, grass will be reestablished and the whole crest of the multi-use trail will be restored to a uniform elevation. The Delaware River dry-laid stone armoring will be replaced within segments of the embankment damaged by the storms. A pilot compaction grouting program is also planned for approximately 100 linear feet. The pilot program will evaluate the effectiveness of the stability improvement and serve as a guide for subsequent compaction grouting. Approximately 740 linear feet of embankment will be grouted within selected areas. The work is currently projected to begin in FY21.

Rehabilitation of the Swan Creek Aqueduct & Culvert

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

Repairs were made to the 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 as a result of the seepage. The seepage was slowed significantly by the injection of the grout, although it did not stop completely.

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

The scope of work for the 2014 repair project was reduced during construction due to dewatering issues and safety concerns of the contractor. The corrugated metal liner in the north culvert

showed signs of being corroded, limiting the amount of work which could be conducted in the culvert.

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

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

Preliminary Engineering and Owner's Engineer

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

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

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

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

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

Round Valley Reservoir Electrical Services Upgrades

Round Valley Security Improvements (Cameras)

Background Screening of Contractors and Consultants

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

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

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

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

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

Schnabel Engineering was procured to act as the Engineer of Record to investigate, plan, design, and provide full time construction management services for the above noted efforts. Gannett Fleming was procured to provide further engineering and consulting services during design and construction of the Round Valley Dam rehabilitation. The Authority will utilize Gannett Fleming 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, Gannett Fleming will continue to provide advice and consultation to Authority staff during this very important project.

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

- Dredging of the Round Valley South Tower Intake Channel (detailed below);
- Security improvements at RV Reservoir (detailed below);
- Consider alternatives to rehabilitate the hydraulic valve on the Round Valley South Dam (detailed below);
- Remove and replace 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;
- Installation of new toe drains to filter, collect, and convey embankment and foundation seepage safely away from the structures;
- Electrical service improvements to the three embankments at RV Reservoir (detailed below);
- Grouting of the abutments at the North and South Dams.

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

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

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

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

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

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

The investigation and design for this project is included in the scope for the Engineer of Record on the Round Valley Reservoir Dams-Rehabilitation & Resource Preservation Project. It was anticipated that the sediment will be collected using a dredge. The chosen design called for

relocation of the sediment to the deepest parts of the reservoir. The project was bid, awarded, constructed, and completed in the winter of 2019/2020 (FY20).

This project was bid out separately from the other RV projects so that it can be completed ahead of the large scale embankment modifications. Since it will be bonded, funding is not included in the CIP budget.

Round Valley Reservoir Electrical Service Upgrades

The Earthen Dam Rehabilitation and Ancillary Work (detailed below) project requires the installation of a dewatering pumping system at the toe of each embankment. This system will require the use of significant electricity. In advance of the large scale project, the Authority made upgrades to the existing electrical service at the North Dam and South Dam, and will be installing electrical service at the Dike. These services were sized appropriately for the dewatering system at each embankment and future improvements to the structures, including security upgrades and electric actuators. This project also includes upgraded electric panels at each vault, generator transfer switches at each vault, and internet service installation at the Dike (for security improvements). This work will be paid for from the CIP budget and be completed in summer 2020 (FY21)

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

Embankment Modifications

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

Final design plans and technical specifications and permitting are complete. The scope of the design was discussed and vetted at a meeting that included the Engineer of Record, members of Authority staff, representatives of the NJDEP Dam Safety Section, the Authority's Technical Review Board (TRB), and the Owner's Engineer. For the North and South Dams, the design includes excavation into each dam while maintaining a specific slope acceptable to the Engineer of Record and the TRB. The soils removed from the embankments will be stockpiled at or near each dam site. Once the excavation has reached a certain depth, a sand and gravel filtering drain 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. The maximum allowable reservoir pool elevation during the project will be EL 360 feet, or 25 feet below normal pool.

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

This project (Earthen Dam Rehabilitation & Ancillary Work) was bid in the fall of 2019 and awarded to a contractor with a notice to proceed in January of 2020 and construction initiated shortly thereafter. The embankment work is phased with the Dike being constructed first, followed by the North Dam, and then the South Dam. The project is scheduled to continue through the beginning of FY23. This work will be paid for through a separate application for bonding. Since it will be bonded, funding is not included in the CIP budget

Round Valley Ancillary Work

Rehabilitate Hydraulic Valve on RV South Dam Low-Level Release

The existing RV low-level release valve was last rehabilitated in 1992 when a hydraulic valve actuator and hydraulic control system were installed at the Round Valley South Tower. This hydraulic system, with hoses reaching down to 180 feet below the water surface to the low level release valve, replaced the out-of-service original control system. The hydraulic valve installed in 1992 is no longer functional and 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. After inspection of the system and a report of proposed alternatives, the alternative selected is the complete abandonment of the low-level release pipeline. Abandonment will be accomplished by filling the pipeline with grout. The hydraulic lines to the underwater actuator will be removed. This work is included in the contract for the Earthen Dam Rehabilitation and Ancillary Work contract and paid for through the above noted bonding. Since it is being bonded, funding is not included in the CIP budget.

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. The alternative selected for the repair is to replace the pipe by direct burial.

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

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

The building structures (towers and vaults) at the Round Valley Reservoir are in need of maintenance. Authority staff 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, and replacement of the existing cranes. This project will also include the purchase of an emergency portable generator to be used with the transfer switches being installed at each vault as part of the Round Valley Reservoir Electrical Upgrades project.

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

Security Improvements at RV Reservoir

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

Security Improvements RV and SR Perimeter Hardening

Additional security improvements are considered for the RV and SR embankments on a continual basis. Furtherance of the existing perimeter hardening is being considered as part of the next improvements to the existing security. It is anticipated that this work will be completed as part of multiple projects over the next several years.

Background Screening of Contractors and Consultants

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

The chosen security consultant is providing the necessary equipment, such as hand held scanners and other associated communications hardware for all access gates at the Round Valley project. This contract started in FY20 and is expected to run while the Earthen Dam Rehabilitation and Ancillary Work contract is ongoing, expected to finish in FY23.

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 believes that it is prudent to invest in a new study where computers model the flows based on 2-D topographic squares in the flood zones. The degree of accuracy of this method far surpasses the existing 1980 1-D studies. Modern deliverables may also include animations as well as color coded mapping layers depicting depth of water in any particular area in a time-sequenced video. It is also possible to better simulate the effect of tidal fluctuations on the inundation area, which was not possible to analyze at the time of the initial models. This work will begin after the ongoing dam rehabilitation work is complete so that the modeling correctly represents the final configuration of the dams.

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, thereby reducing its capacity and the efficiency of the pumping operation. Sediment was last removed from the pond in 1986.

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 procured a consultant to provide professional engineering services to prepare designs, obtain permits, and provide on-call construction management for the dredging of the intake channel and pond, replacement of the release structure's ice deflectors, and the painting of the intake ice deflectors and trash racks. This work has been underway since spring of 2020 and project completion is expected in fall of 2020 (FY21).

Rehabilitation of the Six-Mile Run Culvert

The Six-Mile Run Culvert is a 3-barrel historic stone arched culvert that carries the Six-Mile Run under Canal Road, the Canal, and the multi-use trail. The culvert was rehabilitated in the mid-1980s. Stone-faced concrete headwalls were constructed at the inlet and outlet ends of the barrels and minor stone repair was performed inside the culvert barrels. A portion of the stone facing on the downstream headwall dislodged from the concrete substructure during the winter

of 2005-2006.

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

In July 2017, a sinkhole formed in the roadway above the structure, requiring emergency repairs. The emergency repairs were performed by a consultant and contractor procured by the Authority. This sinkhole suggested that the movement of soils above the stone arches that form the culvert is occurring. The emergency repairs were considered to be temporary. Inspections of the upstream interior of the culvert, located directly beneath Canal Road, have confirmed missing stones and movement of soil.

Additional temporary repairs have been performed within the barrels to limit the loss of stonework in the interior of the culvert by filling with a lightweight concrete. Engineering services have been procured, and are in the design phase 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. The consultant was tasked with designing plans to clean and inspect the culvert, which were bid in FY20. The bids were ultimately determined to not be feasible, and other options for inspecting the culvert, including dye testing, were initiated. Engineering design is expected to be completed in FY21, and construction is expected to take place in FY21 and FY22.

Replacement of Fuel Dispenser and software/inventory system at Spruce Run Administration Building

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

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

The Authority retained the professional engineering services of a consultant to investigate, design, and provide part-time construction management for the rehabilitation project. The construction was bid in February 2019 and the selected the contractor performed a portion of the work, before an inspection revealed deterioration that required additional upgrades. New plans and specifications were prepared by the consultant and permits are being obtained. It is expected that the project will be completed in FY21.

Replace Office Telephone System Authority Wide

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

Facilities personnel will also be able to access and service all systems from one location. Upgrading the systems would necessitate the replacement of all components, including handsets, door phones, and conference phones. Additional and replacement wiring and switching will also be required. Phone system replacement is anticipated for FY21. Investigation is ongoing to ensure there is a redundant communications system in the event of an emergency.

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

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

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

This project represents the second phase of the rehabilitation. An engineering consultant will investigate and design the rehabilitation of four additional pumps, motors, and mountings in the north and south bays of the SBPS, listed as pump Nos. 4, 5, 7, and 8. The project will include fabrication and installation of new baseplates to address alignment issues. It is expected that the consultant will perform an investigation to identify appropriate rehabilitation items, secure needed permits and approvals, and prepare the construction plans and specifications that are necessary to bid the project.

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

Replace Boilers at Spruce Run Administration Building

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

Replace Water Storage Tanks in Spruce Run Administration Building Basement

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

Emergency Generator at Spruce Run Administration Building

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

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

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

A. Rehabilitation of the Spruce Run Flow Measuring Weir

The Spruce Run Weir is a reinforced concrete structure that crosses the Spruce Run downstream of the Spruce Run Reservoir and overflow spillway and upstream from Spruce Run's confluence with the South Branch of the Raritan River. The spillway was constructed in the early 1960s with the rest of Spruce Run Dam. The adjoining USGS gauging station on the west bank of the weir measures the total flow of water that is discharging from Spruce Run, including releases through the pipelines and/or overflow at the spillway. Authority staff has been making "patchwork" repairs to the spillway over the past decade; however, the concrete structure is severely degraded, with large amounts of exposed reinforcing steel and visible seepage, indicating that the structure is in need of improvements. The consulting engineer is investigating the weir and will design repairs or replacement, potentially including a bypass gate. As the structure may meet the definition of a dam, the rehabilitation project includes development of measures to bring the dam into compliance with the New Jersey Bureau of Dam Safety.

B. Spruce Run Primary Overflow Spillway Rehabilitation

The primary ogee overflow spillway is located at the west abutment of the dam with a crest at elevation 273.0, which is the normal full operating pool level of the reservoir. The control weir for the spillway is a 550-foot long, 5-foot high reinforced concrete overflow weir with an ogee downstream face. In plan, the spillway is a circular arc oriented generally north-south. The spillway was constructed in the early 1960s with the rest of the dam. The spillway was rehabilitated in 1987 to repair longitudinal surface cracks, surface spalling, and transverse joint deterioration along the downstream face. As deterioration of the concrete surface of the spillway continued, including spalling and horizontal cracking, a second rehabilitation was done in the fall of 2004. The rehabilitation work consisted of removing deteriorated concrete from the spillway weir and abutment wall surfaces, and applying gunite to all prepared surfaces. Over time, mild spalling and cracking were observed in the fiber reinforced, gunite overlay. During a recent inspection in March of 2019, more significant concrete/gunite damage was observed at the toe of the ogee. Also, some spalling and cracking has been observed at the bottom of the ogee spillway's abutment walls. The consulting engineer will investigate the concrete structure and make an engineering repair recommendation.

C. Clearing of Spruce Run Spillway Discharge Channel

The Spruce Run Spillway was cut into the bedrock as part of the original Spruce Run Dam construction. 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 help to restore the spillway to its original layout and design capacity.

D. Replace Fixed Cone Valves at Spruce Run Vault

The Spruce Run Reservoir Vault is fitted with two 30-inch fixed cone valves that serve as the primary release valves from Spruce Run Reservoir. When compared to other valves, the fixed cone valves allow for increased accuracy in release quantities and also offer significant pressure reduction. When the structure was reconstructed in 1982, the original valves that were installed in the early 1960s were relocated to their current position. Authority staff performs annual maintenance on the valves, but corrosion present on the valves is making this maintenance increasingly difficult over time. 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 service life. The consulting engineer is evaluating the existing valves and Authority operations in order to recommend the most appropriate replacement for the existing fixed cone valves.

E. Manual Transfer Switch for Emergency Operation

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

F. Spruce Run Tower Hoisting Equipment

The existing outlet tower overhead bridge crane is a hand operated geared bridge and trolley type with a motor driven hoist. The bridge is constructed on standard I beams with a hand chain operated drive. The overhead bridge crane is original to the dam construction in the early 1960s and it is still operational to remove and/or reinstall the stop logs during release operations. However, the unit has developed a minor "travel" over the years, which is sometimes observed during stop-plank hoisting. In addition, it has become difficult to purchase parts for the crane system. The consulting engineer will investigate the existing overhead bridge crane, review the

load rating and recommend a partial or full replacement of an equal or alternate type of crane in compliance with OSHA regulations.

G. Spruce Run Tower Sluice Gate Operators

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

H. Spruce Run Other Ancillary Works

The multidisciplinary project includes the installation of a door on the southern façade of the vault, OSHA compliant exterior access ladders for the tower and vault, remote reading capability of the vault releases, thorough inspection of the release tower superstructure, and replacement of the tower and vault roofs and the installation of a hardened access gate adjacent to the vault.

I. Reservoir Hydrologic and Hydraulic Modeling

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

The 2017 PFMA report concluded in the Major Findings and Understandings section that even though a hydrological analysis showed that the dam was able to pass the Probable Maximum Flood (PMF) without overtopping, an updated hydrological analysis was recommended using current analysis methods. As a result, the consulting engineer will develop hydrologic and hydraulic models that evaluate the capacity of the existing dam and spillway relative to the runoff produced by the Probable Maximum Precipitation (PMP) in compliance with the spillway design storm requirements of the NJDEP Bureau of Dam Safety.

J. Rapid Drawdown Planning

The outlet works at Spruce Run reservoir consist of an intake tower and twin pipes leading to a control vault at the downstream toe of the dam. Each of the twin pipes reduce from 84-inch diameter at the intake tower to 60-inch diameter near the control vault and to 48-inch diameter

within the vault. The consultant is reviewing the current drawdown operations and computations, and propose mechanical improvements if necessary.

Wastegate and Lock Evaluation and Repair – D&R Canal

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

Improvements to Scudders Falls Wastegate Controls

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

Rehabilitation of the Upper Canal Embankment - Raven Rock to Prallsville

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 separates the Canal from the River. It is very narrow and is inaccessible by vehicle, so it is necessary to maintain the embankment by boat, which is challenging. During 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 close the openings. These temporary repairs require replacement with more appropriate materials, both structurally and historically.

An engineering consultant and a cultural resources consultant were retained to design repairs to this section of the embankment. A professional services contract was awarded to a team led by

GZA GeoEnvironmental (GZA) as the engineer for the repairs of the embankment. Paulus, Sokolowski, & Sartor (PS&S) was selected as the cultural resource consultant for the project.

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

A schematic design report identified and prioritized additional areas that warrant repair and these areas have been added to the scope of work. Conceptual approval has been received from the State Historic Preservation Office. The approach to completing these repairs has been further refined and the Authority is working with the consulting engineer to obtain necessary approvals and develop a final design. Final design is expected in FY21.

Rehabilitate Flow Control Gate at Back Race at Lambertville

The back raceway in Lambertville, located approximately at Station 371+00, consists of one manually operated gate and was constructed as a by-pass to the Lambertville Lock. Due to the configuration of the raceway, the Authority uses this gate during the summer months to prevent the water from stagnating and to flush the algae that may accumulate. Further, it can be used to bypass Canal flow in the event it is necessary to work on the lock. The flow control gate is in need of rehabilitation.

Rehabilitation of Canal Flow Structures

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

Schnabel's evaluation of these structures identified a variety of repairs needed at each site. In addition to the replacement of some flow control gates, the deficiencies range from minor cracking and spalling of the concrete to repair of the structural undermining of the locks. The Authority would also like to upgrade each gate to include an electrically powered operator, this will allow for quicker and safer operation of the gates by Authority personnel.

The Authority plans to phase in gate replacement, operational improvements and structural rehabilitation based on operational priorities and the results of upcoming underwater engineering evaluations.

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

The Landing Lane Spillway is located immediately upcanal of the Landing Lane Bridge in New Brunswick. This spillway was rehabilitated in 1991 with the construction of a concrete cutoff wall on the Canal side slope to control leakage. Timber planks were installed on the concrete

wall for historic reasons. The spillway was finished with 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 installation of 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 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 an engineer and a cultural resource consultant for both projects. It was anticipated that construction of the projects would be procured together, but the designs progressed at different speeds and they have been separated. The design plans and technical specifications for the Landing Lane Spillway Rehabilitation are near complete, and construction is expected in FY21/FY22. The Embankment Improvements Downstream of the Island Farm Weir was bid in summer 2020 and construction is anticipated in fall 2020 (FY21).

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 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 its historic stone bridge abutment at the Washington Crossing Bridge. At the time of notification, the Authority had been operating the Canal at raised levels in that vicinity to address a flow problem in the Trenton area. The higher than normal levels of the Canal caused the Washington Crossing spillway, which is directly adjacent to the abutment, to operate (overflow).

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

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

Security System and Upgrades –Clinton and Canal

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

Rooftop Hydronic Heater for Auto - Spruce Run Admin.

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

Alexauken Creek Aqueduct

Paralleling the western side of the Alexauken Creek Aqueduct is the former Belvidere-Delaware Railroad concrete bridge, which passes over the creek, immediately adjacent to the 1940s-era concrete aqueduct trunk.

The Aqueduct's historic (circa 1834) northeast, center, and southeast stone abutments were rehabilitated in 1989-1990. Recent inspections revealed that all of the abutments have missing mortar on the lower areas, which are continuously exposed to the water level fluctuation. In addition, the northeast abutment shows vegetation covering the structure on the creek side.

It is noted that a new Canal leak was detected in May 2007 below the northeast abutment's masonry. Further investigation 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 has been observed on 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 anticipated that repairs to address the leaks will be undertaken.

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.

Recently, as part of the foreseen minor repairs, an engineering diving consultant has performed two separate underwater repairs to stop the leak near the lake's staff gauge. The two underwater repairs were done in December 2019 and May 2020.

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

The 26 through-the-wall HVAC units at the Spruce Run Administration Building have reached the end of their service life. They were installed in 1994. Replacement parts are becoming difficult to obtain and the units are constantly in need of service. Authority staff developed an in-house project to replace 21 PTACs. The project was publicly bid and the responsive low bidder signed an agreement in January 2020. Completion of the project is expected in September 2020 (FY21).

Rehabilitation of the Wastegate Downstream of Ten Mile Lock

The wastegate is located at Canal Station 2599+50, approximately 600 feet downstream of the Ten Mile Lock in Franklin Township, Somerset County. The existing non-operational wastegate consists of a wooden gate structure set between guides that are attached to the recessed portion of a concrete inlet headwall. A 60-inch diameter concrete pipe 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 wastegate façade and the downstream stone headwall needs to be rehabilitated.

Rehabilitation of the Spillway Upcanal of the Griggstown Lock

The spillway upcanal of the Griggstown Lock between Station 2060+40 and Station 2064+20 of the Canal in Franklin Township, Somerset County is in poor condition and warrants rehabilitation. The 380-foot long spillway was built as part of the original Canal construction in the 1830s and is part of the Canal's flood control system into the Millstone River. Engineering services are required in order to inspect the structure, prepare a schematic design, prepare a design of the approved rehabilitation alternative and provide construction management services during the rehabilitation of the structure. A cultural resource consultant is also required to perform a cultural resource investigation for the rehabilitation of the spillway and to provide observation during rehabilitation.

Rehabilitation of the spillway will be scheduled after the dredging program between Kingston and Amwell Road is complete so that the reconstructed spillway does not get damaged during the project. Funding for this project is not included in this five year program.

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

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

Replace Boiler at Canal Field Office

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

Replace Underground Heating Oil Tank at South Branch Pumping Station

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

Replace Underground Heating Oil Tank at Spruce Run Administration Building

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

corrosion. This would reduce the environmental liability of the Authority in the long term and reduce insurance policy costs.

Replace Gasoline and Diesel Underground Storages Tanks at Spruce Run Administration Building Fuel Island

The existing 5,000 gallon and 2,000 gallon steel fiberglass coated underground storage tanks (USTs) will be in need of replacement in the near future. These tanks contain gasoline and diesel fuel, respectively, for the maintenance equipment and vehicle fleet being used by the Spruce Run Administration Building staff, South Branch Pump Station staff, and Watershed Protection staff. These are approximately 30 years old. If replaced with an underground tank, the new tanks would likely be modern double-wall fiberglass reinforced USTs. This project would also include the abandonment/removal of the existing fiberglass coated steel tanks with a contracted licensed LSRP and permitting with the NJDEP. However, the recommendation at this time would be to replace the two tanks with above ground storage tanks in an alternate location adjacent to the fueling island. Above ground tanks are not regulated in the same manner as underground storage tanks because it is much easier to detect corrosion. This would reduce the environmental liability of the Authority in the long term and reduce insurance policy costs.

Spruce Run Administration Building Network Data Closet Construction

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

Replace Heaters at Langenfelder Maintenance Building

The 2 oil-fired hot air heaters at the Langenfelder Maintenance Building are nearing the end of their service life and should be replaced.

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 1830s and is part of the Canal's flood control system into the Millstone River. Engineering services are required in order to inspect the structure, prepare a schematic design, prepare a design of the approved rehabilitation alternative and provide construction management services during the rehabilitation of the structure. A cultural resource consultant is also required to perform an investigation for the rehabilitation of the spillway and to

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

Dredging between Amwell Road and Ten Mile Lock

Dredging 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 will focus on the removal of sediment from this reach. Funding for this project is not included in this five year program.

Storage Building at Canal Field Office

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

Spruce Run Administration Building Tie-In to Public Water Supply

The Authority is conducting a preliminary study/investigation into the possibility of connecting to the regional municipal public water supply system. There are allocation and supply issues being experienced by the local water company which may delay this process, as well as the potential for water system connection fees. This would allow the Authority to abandon the local

administration building supply well and the well to the Annex and the Watershed offices. Funding for this project is not included in this five year program.

Storage Building near Spruce Run Annex

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

Construction of a Bedload Stone Trap at the Wickecheoke Creek

Wickecheoke Creek enters the Canal just upstream of the Prallsville Lock Control Structure on the border of Delaware Township and Stockton Borough in Hunterdon County. Excess flow from the Canal and the Creek are discharged over the Wickecheoke Creek spillway into the Delaware River. Investigations in the early 1990s resulted in a recommendation to construct a bedload stone trap in the creek, upstream of its confluence with the Canal, to improve the ability to remove the bedload without disrupting the flow in the Canal.

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

Cutoff Wall in the Shipetaukin Creek Guard Bank

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

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

The construction of a cutoff wall is planned in this reach of the embankment. The depth of the cutoff wall is expected to range between 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 of ease of installation, but may cause permit problems.

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

Wickecheoke Creek Gates Abandonment

Authority staff has been instructed to not operate these wastegates 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 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 Bull's 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 culvert conveys Mile-Run Creek under the Canal and discharges 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 appears to be in good condition. On the west barrel it was observed that the gunite layer has spalled away at several locations at the mid-length of the barrel, above the footing.

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

Concrete Repairs at the Sullivan Way Aqueduct

The Sullivan Way Aqueduct is located in the City of Trenton, Mercer County. The structure was constructed in the early 1900s and has been waterproofed and patched several times. The superstructure is a concrete encased steel structure constructed to carry the Canal over Sullivan Way. The concrete on the abutments is spalling and needs attention. Funding for this project is not included in this five year program.

Rehabilitation of the Four-Mile Spillway

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

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

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

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

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

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

Pipeline Evaluation – Whitehouse Release Pipeline

The Round Valley Release Pipeline (RVRP) conveys water from the Round Valley North Vault to the Whitehouse Release. 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 contain broken prestressing wire that may lead to additional ruptures of the pipe sections. The RVRP was converted into a gravity release pipeline in 1996 with the installation of pressure reducing valves in the North Vault. The reduced pressure design assumes that all the prestressing wire has failed and relies on the strength of the embedded steel cylinder. It was recommended that the pipeline continue to be monitored on a regular basis. The manufacturing and installation dates of the specific pipe sections used in this release line fall within the range of dates when there were faulty materials being manufactured in the industry, resulting in failures of pipelines of similar vintage.

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

Pipeline Evaluation - RV Force Main

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

Non-destructive testing of the Force Main was conducted in 1999. The non-destructive testing identified that the majority of the pipe sections were in very good condition. Approximately 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 conduct scheduled internal inspections of the force main piping. Staff will continue its periodic inspection of the pipeline and take action accordingly.

PART III – PROPOSED RULE AMENDMENT

NEW JERSEY WATER SUPPLY AUTHORITY

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

To Become Effective July 1, 2021

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)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] **182.339** million gallons per day has been used in setting the rate listed in (b) below.

(b) General rate schedule for operations and maintenance:

Period (State fiscal year unless otherwise indicated)	Allocation	Rate/Million Gallons

State fiscal year [2021] **2022**	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] **182.339** million gallons per day, will be applied to all customers.

Period (State fiscal year unless otherwise indicated)	Allocation	Rate/Million Gallons
State fiscal year [2021] **2022**	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 unless otherwise indicated)	Allocation	Rate/Million Gallons

State fiscal year [2021] **2022**	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 (State fiscal year unless otherwise indicated)	Allocation	Rate/Million Gallons
State fiscal year [2021] **2022**	Million Gallons per Day (MGD)	$24.00

APPENDICES

I. Report of Mercadien PC – Allocation of Headquarters General and Administrative Expenses – FY2022

NEW JERSEY WATER SUPPLY AUTHORITY
(A COMPONENT UNIT OF THE STATE OF NEW JERSEY)
AGREED-UPON PROCEDURES REPORT

FORECASTED COST ALLOCATION SCHEDULES

YEAR ENDING JUNE 30, 2022

NEW JERSEY WATER SUPPLY AUTHORITY
(A COMPONENT UNIT OF THE STATE OF NEW JERSEY)

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INDEPENDENT ACCOUNTANT'S REPORT ON APPLYING AGREED-UPON PROCEDURES

To the Commissioners of
New Jersey Water Supply Authority

We have performed the procedures enumerated below, which were agreed to by the Commissioners and Authority management, on the forecasted cost allocation schedules of the New Jersey Water Supply Authority (a component unit of the State of New Jersey) (the "Authority"), for the fiscal year ending June 30, 2022. These procedures were performed solely to assist you in evaluating the forecasted cost allocation schedules in connection with setting of water rates for each of the three operating systems (Raritan, Manasquan Reservoir and Manasquan Treatment Plant/Transmission). The Authority's management is responsible for preparing and presenting the schedules in accordance with the guidelines for the presentation of schedules established by the American Institute of Certified Public Accountants. The sufficiency of these procedures is solely the responsibility of those parties specified in this report. Consequently, we make no representation regarding the sufficiency of the procedures enumerated below either for the purpose for which this report has been requested or for any other purpose.

1. We were provided with the fiscal year 2022 budgeted expenses for each of the three operating systems by the Authority's Director of Finance and Administration, who advised us that the fiscal year 2022 budgeted expenses are based upon preliminary budgets that are subject to approval by the Authority's Commissioners. We performed no procedures in regard to the fiscal year 2022 budgeted expenses.

2. We recalculated the allocated costs on the forecasted cost allocation schedules. We found no exceptions as a result of these procedures.

3. We compared the methodologies used for cost allocation on the forecasted cost allocation schedules to the methodologies used in the Authority's cost allocation schedules for the year ended June 30, 2020, and found them to be consistent.

This agreed-upon procedures engagement was conducted in accordance with attestation standards established by the American Institute of Certified Public Accountants. We were not engaged to and did not conduct an examination or review, the objective of which would be the expression of an opinion or conclusion, respectively, about whether the forecast is presented in accordance with the guidelines for the presentation of a forecast established by the American Institute of Certified Public Accountants or whether the underlying assumptions are suitably supported or provide a reasonable basis for management's forecast. Accordingly, we do not express such an opinion or conclusion. Had we performed additional procedures, other matters might have come to our attention that would have been reported to you.

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INDEPENDENT ACCOUNTANT'S REPORT ON APPLYING AGREED-UPON PROCEDURES (CONTINUED)

There will usually be differences between the forecasted and actual results because events and circumstances frequently do not occur as expected, and those differences may be material. We have no responsibility to update this report for events and circumstances occurring after the date of this report.

This report is intended solely for the information and use of the Commissioners and management of the Authority and is not intended to be, and should not be, used by anyone other than these specified parties.

Mercadien, P.C.
Certified Public Accountants

October 14, 2020

NEW JERSEY WATER SUPPLY AUTHORITY
(A COMPONENT UNIT OF THE STATE OF NEW JERSEY)

SCHEDULE OF FORECASTED COST CENTER EXPENSE RECLASSIFICATION
YEAR ENDING JUNE 30, 2022

			RECLASSIFICATIONS									
DEPT. #	DEPT./COST CENTER	COST CENTER COSTS	1 HEATING/ ELECTRIC	2 VEHICULAR FUEL	3 PROFESSIONAL FEES	4 INSURANCE	5 TELEPHONE	6 PERMITS	7 WORKERS' COMPENSATION	8 IN LIEU TAXES	9 CHIEF ENGINEER SALARY & FRINGE	REVISED COST CENTER COSTS
	BUILDING HQ	$ -	$ 119,500	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 119,500
	TELEPHONE HQ	-	-	-	-	-	81,000	-	-	-	-	81,000
36	SAFETY	203,600	-	-	(5,000)	-	-	-	-	-	-	198,600
37	SECURITY	1,014,350	-	-	-	-	-	-	-	-	-	1,014,350
14	HUMAN RESOURCES	347,548	-	-	(4,900)	-	-	-	(10,000)	-	-	332,648
16	PURCHASING	524,038	-	(109,688)	-	-	(81,000)	(16,000)	-	-	-	317,350
17	INFORMATION SYSTEMS	186,320	-	-	-	-	-	-	-	-	-	186,320
15	CONTRACTS & RISK MGMT.	1,763,116	-	-	(45,000)	(1,278,616)	-	(96,100)	-	(8,700)	-	334,700
13	FINANCIAL MGMT.	950,830	-	-	(2,730)	-	-	-	-	-	-	948,100
34	AUTO SHOP	298,300	-	109,688	-	-	-	16,000	-	-	-	423,988
35	AUTO SHOP-CANAL	225,900	-	-	-	-	-	-	-	-	-	225,900
10	EXEC. OFFICE	286,500	4,650	-	-	-	-	-	-	-	-	291,150
20, 30, 31-33	WATERSHED, ENGINEERING & O&M (RARITAN SYSTEM)	8,497,934	(124,150)	-	57,630	1,278,616		96,100	10,000	8,700	(12,353)	9,812,477
		14,298,436	-	-	-	-	-	-	-	-	(12,353)	14,286,083
40-60	MANASQUAN SYSTEM	5,425,416	-	-	-	-	-	-	-	-	12,353	5,437,769
		$ 19,723,852	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 19,723,852

NEW JERSEY WATER SUPPLY AUTHORITY
(A COMPONENT UNIT OF THE STATE OF NEW JERSEY)

SCHEDULE OF FORECASTED SYSTEM-WIDE ALLOCATED COSTS
YEAR ENDING JUNE 30, 2022

			ALLOCATION BASIS												
DEPT. #	DEPT./COST CENTER	REVISED COST CENTER COSTS	SQ. FT. #	# OF TELEPHONES	# OF EMPLOYEES	100 % RARITAN O&M	# OF EMPLOYEES	# OF P.O.s	# OF COMPUTERS	MGD CONTRACTS	O&M BUDGET	# OF VEHICLES	# OF VEHICLES	TIME ESTIMATE	ALLOCATED COST CENTER COSTS
	BUILDING HQ	$ 119,500	$ (119,500)												
	TELEPHONE HQ	81,000	-	$ (81,000)											
36	SAFETY	198,600	803	880	$ (200,283)										
37	SECURITY	1,014,350	4,519	3,522	16,094	$ (1,038,485)									
14	HUMAN RESOURCES	332,648	5,345	2,641	1,788	-	$ (342,422)								
16	PURCHASING	317,350	6,637	2,641	3,576	-	6,714	$ (336,918)							
17	INFORMATION SYSTEMS	186,320	1,196	880	1,788	-	3,357	10,018	$ (203,559)						
15	CONTRACTS & RISK MGMT.	334,700	3,909	1,761	3,576	-	6,714	7,130	3,635	$ (361,425)					
13	FINANCIAL MGMT.	948,100	11,405	5,283	10,729	-	20,142	4,874	21,810	-	$ (1,022,343)				
34	AUTO SHOP	423,988	17,962	1,761	3,576	-	6,714	14,892	3,635	-	26,771	$ (499,299)			
35	AUTO SHOP-CANAL	225,900	-	1,761	1,788	-	3,357	7,491	3,635	-	14,264	-	$ (258,196)		
10	EXEC. OFFICE	291,150	15,783	6,163	1,788	-	3,357	2,347	3,635	-	18,384	-	-	$ (342,607)	
20, 30, 31-33	WATERSHED, ENGINEERING & O&M (RARITAN SYSTEM)	9,812,477	51,941	53,707	107,297	1,038,485	201,426	162,186	109,049	326,602	619,575	499,299	258,196	325,477	$ 13,565,717
40-60	MANASQUAN SYSTEM	5,437,769	-	-	48,283	-	90,641	127,980	58,160	34,823	343,349	-	-	17,130	6,158,135
		$ 19,723,852	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 19,723,852

NEW JERSEY WATER SUPPLY AUTHORITY
(A COMPONENT UNIT OF THE STATE OF NEW JERSEY)

SCHEDULE OF FORECASTED COST ALLOCATION FACTORS
YEAR ENDING JUNE 30, 2022

	ALLOCATION OF:	BUILDING HQ	TELEPHONES	SAFETY	HUMAN RESOURCES	PURCHASING	INFORMATION SYSTEMS	CONTRACTS & RISK MGMT.	FINANCE O&M	AUTO SHOP	AUTO SHOP CANAL	EXEC. OFF
	ALLOCATION BASIS:	SQ. FT. #	# OF TELEPHONES	# OF EMPLOYEES	# OF EMPLOYEES	# OF P.O.'S	# OF COMPUTERS	MGD CONTRACTS	FUNCTIONAL COST	# OF VEHICLES	# OF VEHICLES	TIME ESTIMATE
DEPT. #	DEPT./COST CENTER											
	BUILDING HQ	-	-	-	-	-	-	-	-	-	-	-
	TELEPHONE HQ	-	-	-	-	-	-	-	-	-	-	-
36	SAFETY	100	1									
37	SECURITY	563	4	9								
14	HUMAN RESOURCES	666	3	1								
16	PURCHASING	827	3	2	2							
17	INFORMATION SYSTEMS	149	1	1	1	111						
15	CONTRACTS & RISK MGMT.	487	2	2	2	79	1					
13	FINANCIAL MGMT.	1,421	6	6	6	54	6	-				
34	AUTO SHOP	2,238	2	2	2	165	1	-	$ 423,988			
35	AUTO SHOP-CANAL	-	2	1	1	83	1	-	225,900			
10	EXEC. OFFICE	1,967	7	1	1	26	1	-	291,150	-		
20 30 31 32 33	WATERSHED, ENGINEERING & O&M (RARITAN SYSTEM)	6,472	61	60	60	1,797	30	182	9,812,477	48	48	95
40-60	MANASQUAN SYSTEM			27	27	1,418	16	19	5,437,769			5
		14,890	92	112	102	3,733	56	202	$ 16,191,284	48	48	100

NEW JERSEY WATER SUPPLY AUTHORITY
(A COMPONENT UNIT OF THE STATE OF NEW JERSEY)

SCHEDULE OF FORECASTED MANASQUAN SYSTEM ALLOCATED COSTS
YEAR ENDING JUNE 30, 2022

		ALLOCATION BASIS					
		1	2	3	4	5	
	COSTS	TIME STUDY	$ VALUE OF VEHICLES	$ VALUE OF EQUIPMENT	TIME STUDY	VALUE OF WATER CONTRACTS	ALLOCATED COSTS
GENERAL & ADMINISTRATIVE							
SALARIES & FRINGES	$ 3,156,600	$ (3,156,600)					
VEHICLE RELATED	98,050	-	$ (98,050)				
MAINT. SUPPLIES & RELATED	91,350	-	-	$ (91,350)			
OFFICE & MISC.	53,100	-	-	-	$ (53,100)		
H.Q. OVERHEAD	732,719	-	-	-	-	$ (732,719)	
RESERVOIR (40)	1,116,400	1,503,995	70,606	45,246	25,300	632,117	$ 3,393,664
TREAT./TRANS. (50)	909,916	1,652,605	27,444	46,104	27,800	100,602	2,764,471
	$ 6,158,135	$ -	$ -	$ -	$ -	$ -	$ 6,158,135

NEW JERSEY WATER SUPPLY AUTHORITY
(A COMPONENT UNIT OF THE STATE OF NEW JERSEY)

NOTES TO FINANCIAL SCHEDULES
YEAR ENDING JUNE 30, 2022

NOTE 1 GENERAL

The New Jersey Water Supply Authority as part of its annual budget and rate making process performs a two-step cost allocation calculation. During the first step, the Authority forecasts its actual expenses by Cost Center. For purposes of this calculation the Authority uses the following Cost Centers:

Raritan System
- Building Headquarters
- Telephone Headquarters
- Safety
- Security
- Human Resources
- Purchasing
- Information Systems
- Contracts & Risk Management
- Financial Management
-Auto Shop
- Auto Shop - Canal
- Executive Office
- Engineering, Watershed Management, Operations and Maintenance (Raritan System)
- Manasquan System

In deriving expenses by Cost Center several expense reclassifications are made on the Schedule of Forecasted Cost Center Expense Reclassification as follows:

1. Heating and electricity expenses related to Building Headquarters ("HQ") and Executive Office are reclassified from Engineering and Operations & Maintenance ("O & M").

2. Vehicular fuel expense related to Auto Shop is reclassified from Purchasing.

3. Professional fees related to O & M are reclassified from the various departments to which they have been charged.

4. Insurance premium expense related to the Raritan System is reclassified from Contracts and Risk Management.

5. Telephone expense is reclassified from Purchasing to a separate Telephone HQ Cost Center.

6. Permit expense related to the Raritan System is reclassified from Contracts and Risk Management and Purchasing.

7. Workers' compensation expense related to the Raritan System is reclassified from Contracts and Risk Management.

8. In-lieu taxes related to the Raritan System are reclassified from Contracts and Risk Management.

9. Chief Engineer Salary & Fringe Expenses related to the Manasquan System are reclassified from the Engineering Department.

NOTE 1 GENERAL (CONTINUED)

The second step entails a step-down allocation of eleven of the Authority's Cost Centers to the Raritan and Manasquan System Cost Centers. In making this step-down allocation the Authority allocates costs as follows:

1. Building HQ is allocated to each of the Cost Centers based on the amount of space utilized.
2. Telephone HQ is allocated to each of the Cost Centers based on the number of telephones utilized.
3. Safety is allocated to each of the Cost Centers based on the number of employees.
4. Security is allocated entirely to the Raritan System.
5. Human Resources is allocated to each of the Cost Centers based on the number of employees.
6. Purchasing is allocated to each of the respective Cost Centers based on the number of purchase orders issued.
7. Information Systems is allocated to each of the Cost Centers based on the number of computers.
8. Contracts and Risk Management is allocated to each of the Cost Centers based on the number of employees.
9. Financial Management is allocated based on a percentage of the four remaining Cost Centers' budgets.
10. Auto Shop and Auto Shop-Canal are allocated based on the number of vehicles used.
11. Executive Office is allocated based on the amount of executive time utilized in managing each of the Systems.

NOTE 2 MANASQUAN SYSTEM ALLOCATED COST

The Manasquan Water Supply System's direct and allocated costs are then allocated between the Reservoir System and the Water Treatment Plant/Transmission System. In making this allocation the Authority adds to each System's direct expenses, the indirect costs allocated as follows:

1. Salaries and Fringe Benefits are allocated based on actual time studies performed by each employee throughout Fiscal Year 2020.

2. Vehicle related expenses are allocated based on the dollar value of vehicles held by each System.

3. Maintenance Supplies and related expenses are allocated based on the dollar value of capital equipment held by each System.

4. Office and miscellaneous expenses are allocated based on the time studies performed by each employee throughout Fiscal Year 2020.

5. Headquarters Overhead expenses are allocated based on the value of water contracts for each System.

II. Report of Mercadien PC – Allocation of Headquarters General and Administrative Expenses – Audited FY2020 Expenditures

NEW JERSEY WATER SUPPLY AUTHORITY
(A COMPONENT UNIT OF THE STATE OF NEW JERSEY)

EXAMINATION REPORT AND FINANCIAL SCHEDULES

June 30, 2020

NEW JERSEY WATER SUPPLY AUTHORITY
(A COMPONENT UNIT OF THE STATE OF NEW JERSEY)

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INDEPENDENT ACCOUNTANTS' REPORT

To the Commissioners of
New Jersey Water Supply Authority

We have examined the conformity of the financial schedules with the cost allocation criteria set forth in Notes 1 and 2, of New Jersey Water Supply Authority (a component unit of the State of New Jersey) (the "Authority"), for the year ended June 30, 2020, listed in the foregoing table of contents. The Authority's management is responsible for conformity of the financial schedules in accordance with the criteria set forth in Notes 1 and 2. Our responsibility is to express an opinion on the conformity of the financial schedules with the cost allocation criteria set forth in Notes 1 and 2, based on our examination.

Our examination was conducted in accordance with attestation standards established by the American Institute of Certified Public Accountants. Those standards require that we plan and perform the examination to obtain reasonable assurance about whether the financial schedules are in conformity with the cost allocation criteria set forth in Notes 1 and 2, in all material respects. An examination involves performing procedures to obtain evidence about the conformity of the financial schedules with the cost allocation criteria set forth in Notes 1 and 2. The nature, timing and extent of the procedures selected depend on our judgment, including an assessment of the risks of material misstatement of the conformity of the financial schedules with the cost allocation criteria set forth in Notes 1 and 2, whether due to fraud or error. We believe that the evidence we obtained is sufficient and appropriate to provide a reasonable basis for our opinion.

In our opinion, conformity of the financial schedules with the cost allocation criteria set forth in Notes 1 and 2, present the Authority's allocation of costs to the Raritan and Manasquan Systems in accordance with the cost allocation criteria set forth in Notes 1 and 2, in all material respects.

This report is intended for the information and use of the Commissioners and management of the Authority, and is not intended to be, and should not be, used by anyone other than these specified parties.

Mercadien, P.C.
Certified Public Accountants

October 14, 2020

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NEW JERSEY WATER SUPPLY AUTHORITY
(A COMPONENT UNIT OF THE STATE OF NEW JERSEY)

SCHEDULE OF COST CENTER EXPENSE RECLASSIFICATION
YEAR ENDED JUNE 30, 2020

DEPT. #	DEPT./COST CENTER	COST CENTER COSTS	RECLASSIFICATIONS 1 HEATING/ ELECTRIC	2 VEHICULAR FUEL	3 PROFESSIONAL FEES	4 INSURANCE	5 TELEPHONE	6 PERMITS	7 WORKERS' COMPENSATION	8 IN LIEU TAXES	9 CHIEF ENGINEER SALARY & FRINGE	REVISED COST CENTER COSTS
	BUILDING HQ	$ -	$ 58,762	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 58,762
	TELEPHONE HQ	-	-	-	-	-	56,245	-	-	-	-	56,245
36	SAFETY	178,960	-	-	-	-	-	-	-	-	-	178,960
37	SECURITY	900,829	-	-	-	-	-	-	-	-	-	900,829
14	HUMAN RESOURCES	284,252	-	-	(3,414)	-	-	-	(3,311)	-	-	277,527
16	PURCHASING	411,918	-	(77,299)	-	-	(56,245)	(16,300)	-	-	-	262,074
17	INFORMATION SYSTEMS	153,814	-	-	-	-	-	-	-	-	-	153,814
15	CONTRACTS & RISK MGMT.	1,666,598	-	-	(47,476)	(1,221,982)	-	(89,619)	-	(28,675)	-	278,846
13	FINANCIAL MGMT.	803,173	-	-	(2,322)	-	-	-	-	-	-	800,851
34	AUTO SHOP	287,019	-	77,299	-	-	-	16,300	-	-	-	380,618
35	AUTO SHOP-CANAL	155,403	-	-	-	-	-	-	-	-	-	155,403
10	EXEC. OFFICE	255,493	4,507	-	-	-	-	-	-	-	-	260,000
20, 30-33	WATERSHED, ENGINEERING & O&M (RARITAN SYSTEM)	6,578,041	(63,269)	-	53,212	1,221,982		89,619	3,311	28,675	(11,120)	7,900,451
		11,675,500	-	-	-	-	-	-	-	-	(11,120)	11,664,380
40-60	MANASQUAN SYSTEM	3,914,040	-	-	-	-	-	-	-	-	11,120	3,925,160
		$ 15,589,540	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 15,589,540

NEW JERSEY WATER SUPPLY AUTHORITY
(A COMPONENT UNIT OF THE STATE OF NEW JERSEY)

SCHEDULE OF SYSTEM-WIDE ALLOCATED COSTS
YEAR ENDED JUNE 30, 2020

			ALLOCATION BASIS												
DEPT. #	DEPT./COST CENTER	REVISED COST CENTER COSTS	SQ. FT. #	# OF TELEPHONES	# OF EMPLOYEES	100 % RARITAN O&M	# OF EMPLOYEES	# OF P.O.s	# OF COMPUTERS	MGD CONTRACTS	O&M BUDGET	# OF VEHICLES	# OF VEHICLES	TIME ESTIMATE	ALLOCATED COST CENTER COSTS
	BUILDING HQ	$ 58,762	$ (58,762)												
	TELEPHONE HQ	56,245	-	$ (56,245)											
36	SAFETY	178,960	395	611	$ (179,966)										
37	SECURITY	900,829	2,222	2,445	14,462	$ (919,958)									
14	HUMAN RESOURCES	277,527	2,628	1,834	1,607	-	$ (283,596)								
16	PURCHASING	262,074	3,264	1,834	3,214	-	5,561	$ (275,947)							
17	INFORMATION SYSTEMS	153,814	588	611	1,607	-	2,780	8,205	$ (167,605)						
15	CONTRACTS & RISK MGMT.	278,846	1,922	1,223	3,214	-	5,561	5,840	2,993	$ (299,599)					
13	FINANCIAL MGMT.	800,851	5,608	3,668	9,641	-	16,682	3,992	17,958	-	$ (858,400)				
34	AUTO SHOP	380,618	8,832	1,223	3,214	-	5,561	12,197	2,993	-	25,886	$ (440,524)			
35	AUTO SHOP-CANAL	155,403	-	1,223	1,607	-	2,780	6,135	2,993	-	10,569	-	$ (180,710)		
10	EXEC. OFFICE	260,000	7,761	4,891	1,607	-	2,780	1,922	2,993	-	17,683	-	-	$ (299,637)	
20, 30-33	WATERSHED, ENGINEERING & O&M (RARITAN SYSTEM)	7,900,451	25,542	36,682	96,408	919,958	166,821	132,836	89,788	270,733	537,311	440,524	180,710	276,415	$ 11,074,179
40-60	MANASQUAN SYSTEM	3,925,160	-	-	43,385	-	75,070	104,820	47,887	28,866	266,951	-	-	23,222	4,515,361
		$ 15,589,540	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 15,589,540

See Independent Accountants' Report.

NEW JERSEY WATER SUPPLY AUTHORITY
(A COMPONENT UNIT OF THE STATE OF NEW JERSEY)

SCHEDULE OF COST ALLOCATION FACTORS
YEAR ENDED JUNE 30, 2020

		REQUIRED STATISTICS										
	ALLOCATION OF:	BUILDING HQ	TELEPHONES	SAFETY	HUMAN RESOURCES	PURCHASING	INFORMATION SYSTEMS	RISK MGMT.	FINANCE O&M	AUTO SHOP	AUTO SHOP CANAL	EXEC. OFF
	ALLOCATION BASIS:	SQ. FT. #	# OF TELEPHONES	# OF EMPLOYEES	# OF EMPLOYEES	# OF P.O.'S	# OF COMPUTERS	MGD CONTRACTS	FUNCTIONAL COST	# OF VEHICLES	# OF VEHICLES	TIME ESTIMATE
DEPT. #	DEPT./COST CENTER											
	BUILDING HQ											
	TELEPHONE HQ											
36	SAFETY	100	1									
37	SECURITY	563	4	9								
14	HUMAN RESOURCES	666	3	1								
16	PURCHASING	827	3	2	2							
17	INFORMATION SYSTEMS	149	1	1	1	111						
15	CONTRACTS & RISK MGMT.	487	2	2	2	79	1					
13	FINANCIAL MGMT.	1,421	6	6	6	54	6	-				
34	AUTO SHOP	2,238	2	2	2	165	1	-	$ 380,618			
35	AUTO SHOP-CANAL	-	2	1	1	83	1	-	155,403			
10	EXEC. OFFICE	1,967	8	1	1	26	1	-	260,000	-		
20, 30-33	WATERSHED, ENGINEERING & O&M (RARITAN SYSTEM)	6,472	60	60	60	1,797	30	182	7,900,451	48	48	92
40-60	MANASQUAN SYSTEM			27	27	1,418	16	19	3,925,160			8
		14,890	92	112	102	3,733	56	202	$ 12,621,632	48	48	100

See Independent Accountants' Report.

NEW JERSEY WATER SUPPLY AUTHORITY
(A COMPONENT UNIT OF THE STATE OF NEW JERSEY)

SCHEDULE OF MANASQUAN SYSTEM ALLOCATED COSTS
YEAR ENDED JUNE 30, 2020

		ALLOCATION BASIS					
		1	2	3	4	5	
	COSTS	TIME STUDY	$ VALUE OF VEHICLES	$ VALUE OF EQUIPMENT	TIME STUDY	VALUE OF WATER CONTRACTS	ALLOCATED COSTS
GENERAL & ADMINISTRATIVE							
SALARIES & FRINGES	$ 2,309,333	$ (2,309,333)					
VEHICLE RELATED	54,422	-	$ (54,422)				
MAINT. SUPPLIES & RELATED	45,271	-	-	$ (45,271)			
OFFICE & MISC.	27,045	-	-	-	$ (27,045)		
H.Q. OVERHEAD	601,323	-	-	-	-	$ (601,323)	
RESERVOIR	859,321	1,169,504	39,189	22,423	12,762	518,747	$ 2,621,946
TREAT./TRANS.	618,646	1,139,829	15,233	22,848	14,283	82,576	1,893,415
	$ 4,515,361	$ -	$ -	$ -	$ -	$ -	$ 4,515,361

See Independent Accountants' Report.

NOTE 1 GENERAL

The New Jersey Water Supply Authority as part of its annual budget and rate making process performs a two-step cost allocation calculation. During the first step, the Authority forecasts its actual expenses by Cost Center. For purposes of this calculation the Authority uses the following Cost Centers:

Raritan System
- Building Headquarters
- Telephone Headquarters
- Safety
- Security
- Human Resources
- Purchasing
- Information Systems
- Contracts & Risk Management
- Financial Management
-Auto Shop
- Auto Shop - Canal
- Executive Office
- Engineering, Watershed Management, Operations and Maintenance (Raritan System)
- Manasquan System

In deriving expenses by Cost Center several expense reclassifications are made on the Schedule of Forecasted Cost Center Expense Reclassification as follows:

1. Heating and electricity expenses related to Building Headquarters ("HQ") and Executive Office are reclassified from Engineering and Operations & Maintenance ("O & M").

2. Vehicular fuel expense related to Auto Shop is reclassified from Purchasing.

3. Professional fees related to O & M are reclassified from the various departments to which they have been charged.

4. Insurance premium expense related to the Raritan System is reclassified from Contracts and Risk Management.

5. Telephone expense is reclassified from Purchasing to a separate Telephone HQ Cost Center.

6. Permit expense related to the Raritan System is reclassified from Contracts and Risk Management and Purchasing.

NOTE 1 GENERAL (CONTINUED)

7. Workers' compensation expense related to the Raritan System is reclassified from Contracts and Risk Management.
8. In-lieu taxes related to the Raritan System are reclassified from Contracts and Risk Management.
9. Chief Engineer Salary & Fringe Expenses related to the Manasquan System are reclassified from the Engineering Department.

The second step entails a step-down allocation of eleven of the Authority's Cost Centers to the Raritan and Manasquan System Cost Centers. In making this step-down allocation the Authority allocates costs as follows:

1. Building HQ is allocated to each of the Cost Centers based on the amount of space utilized.
2. Telephone HQ is allocated to each of the Cost Centers based on the number of telephones utilized.
3. Safety is allocated to each of the Cost Centers based on the number of employees.
4. Security is allocated entirely to the Raritan System.
5. Human Resources is allocated to each of the Cost Centers based on the number of employees.
6. Purchasing is allocated to each of the respective Cost Centers based on the number of purchase orders issued.
7. Information Systems is allocated to each of the Cost Centers based on the number of computers.
8. Contracts and Risk Management is allocated to each of the Cost Centers based on the number of employees.
9. Financial Management is allocated based on a percentage of the four remaining Cost Centers' budgets.
10. Auto Shop and Auto Shop-Canal are allocated based on the number of vehicles used.
11. Executive Office is allocated based on the amount of executive time utilized in managing each of the Systems.

NOTE 2 MANASQUAN SYSTEM ALLOCATED COST

The Manasquan Water Supply System's direct and allocated costs are then allocated between the Reservoir System and the Water Treatment Plant/Transmission System. In making this allocation the Authority adds to each System's direct expenses, the indirect costs allocated as follows:

1. Salaries and Fringe Benefits are allocated based on actual time studies performed by each employee throughout Fiscal Year 2020.

2. Vehicle related expenses are allocated based on the dollar value of vehicles held by each System.

3. Maintenance Supplies and related expenses are allocated based on the dollar value of capital equipment held by each System.

4. Office and miscellaneous expenses are allocated based on the time studies performed by each employee throughout Fiscal Year 2020.

5. Headquarters Overhead expenses are allocated based on the value of water contracts for each System.