Appendix P

Municipal Financial Capability Assessment Memorandums
for all Permittees

Memorandum

To: *City of Bayonne*

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From: *Tom Schevtchuk*

Date: *September 28, 2020*

Subject: *Final Financial Capability Assessment for the City of Bayonne*

1.0 Executive Summary

This Financial Capability Analysis (FCA) memorandum is in support of the Municipal Control Alternative identified in the Selection and Implementation of Alternatives (SIAR) developed by the City of Bayonne. It quantifies the projected affordability impacts of Bayonne's proposed long term CSO controls for the Bayonne combined sewer system (CSS) and updates the 2019 preliminary FCA memo that was intended to guide the development and selection of long term controls.

Projected Impacts of CSO Controls at a Glance		
Baseline: Typical Household 2020		
Annual Wastewater Costs	$701	
Residential Indicator (RI)*	1.2%	
Median Household Income (MHI)	$59,900	
LTCP Control Options	Flow Conveyed to PVSC	
	17 MGD	27 MGD
Capital Costs in million current $	$363	$321
First Year After Fully Implemented	2051	
Impact on Typical Household Cost in:		
Projected Median Household Income	$105,500	
Annual Costs Without the LTCP	$2,2986	
Annual Costs With the LTCP	$3,825	$3,642
Residential Indicator		
Without the LTCP	2.2%	
With LTCP	3.6%	3.5%

As summarized in Table E-1, this FCA includes the projected impacts if the CSO controls are undertaken by Bayonne alone (Municipal Control Alternative) based on the costs and implementation schedule included in Bayonne's SIAR Section F.

While a regional alternative would result in lowered overall costs for the control of CSOs within the PVSC service area, the basis of this allocation remains under discussion as of the writing of this memorandum. Under this approach both the costs of the regional facilities such as a relief interceptor and the resultant savings would be allocated amongst the PVSC municipalities with combined sewer systems. As the basis of this allocation remains under discussion as of the writing of this SIAR, this FCA memorandum focuses on implementation of the Municipal Control Alternative. Should the permittees come to agreement on the cost allocation for the Regional Control Plan, the FCA will be revisited to reassess the affordability and schedule for implementation of the LTCP.

The Financial Capability assessment is a two-step process including ***Affordability*** which evaluates the impact of the CSO control program on the residential ratepayers and ***Financial Capability*** which examines a permittee's ability to finance the program. Affordability is measured in terms of the Residential Indicator (RI) which is the percentage of median household income spent on wastewater services. Total wastewater services exceeding 2.0% of the median household income are considered to impose a high burden by USEPA. The financial capability analysis uses metrics similar to the municipal bond rating agencies.

There are two versions of Bayonne's selected Municipal Control Alternative depending on whether the capacity available to discharge to PVSC is 17 million gallons per day (MGD) or 27 (MGD) which would allow for less facilities within Bayonne and reduced total capital costs. Consequently, Bayonne's SIAR projects future capital costs for the Municipal Control Alternative totaling $363 for the 17 MGD option or $321 million for the 27 MGD option (current dollars) through 2050. Incremental annual O&M costs would be around $1.4 million for the 27 MGD option or $1.2 for the 17 MGD conveyance option.

The second step of the financial capability analysis documents that Bayonne's current financial capability strength is "mid-range". These two metrics combine on EPA's Financial Capability Matrix to indicate a high burden under the USEPA guidance for the $321 to $363 million in capital expenditures proposed under Bayonne's Municipal Control Alternative.

This memorandum is based on information provided by Bayonne, PVSC and external sources such as the on-line fiscal reports available through the New Jersey Department of Community Affairs.[1]

The projections and conclusions concerning the affordability of the Municipal Control Alternative proposed in this SIAR by the City of Bayonne and Bayonne's financial capability to finance the CSO control program are premised on the baseline financial conditions of Bayonne as well as the economic conditions in New Jersey and the United States generally at the time that work on this SIAR commenced. While the impacts of the pandemic on the long-term affordability of the CSO LTCP are obviously still unknown, it is reasonable to expect that there will be potentially significant impacts. There are several dimensions to these potential impacts, including reduced utility revenues and household incomes.

2.0 Introduction

2.1 Intent of the Financial Capability Analysis

This document presents the final Financial Capability Analysis (FCA) relating to the development of the CSO Long Term Control Plan (LTCP) required under Paragraph G(8)(a) of the Combined Sewer Management section of a permittee's NJPDES discharge permit. The assessment is based upon the EPA document "Combined Sewer Overflows – Guidance for Financial Capability Assessment and Schedule Development," (EPA Guidance Document) published February 1997[2], as supplemented by EPA's November 2014 memorandum entitled

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1 https://www.nj.gov/dca/divisions/dlgs/resources/fiscal_rpts.shtml

2 EPA 832-B-97-004

"Financial Capability Assessment Framework for Municipal Clean Water Act Requirements".[3] A preliminary FCA memorandum was provided by PVSC to Bayonne and the other combined sewered permittees within its service area in August of 2019, with a subsequent update in December of 2019.

This final FCA and last year's preliminary versions support the twofold purposes of the FCA as envisioned in the 1994 CSO Control Policy[4] (Policy). First, the FCA is intended to identify the upper limits of what could constitute an affordable future investment strategy as defined by the Policy and related guidance documents under an assumed LTCP implementation schedule; thereby informing the development of CSO, SSO, MS4, TMDL, and other necessary control alternatives. Second, the financial and user cost (affordability) impacts of the selected CSO controls must be assessed to support the development of a workable implementation schedule for the LTCP.[5]

2.2 EPA's Two Step Analysis Process

The Financial Capability assessment is a two phased process. The residential indicator (RI) is the percentage of median household income (MHI) expended on wastewater (including stormwater) management. The upper limit of affordability for wastewater services within the Bayonne will be the point where total wastewater management costs for the typical residential user in Bayonne exceed 2.0% of the Median Household Income (MHI). This metric of total wastewater management costs as a percentage of MHI is termed the Residential Indicator (RI) by USEPA.

The financial capability indicator is an assessment of the permittee's debt burden, socioeconomic conditions, and financial operations. These two measures are subsequently entered into a *financial capability matrix*, suggested by EPA, to determine the level of financial burden placed on residential customers and the permittee by the existing and projected future expenditures to operate, maintain, and enhance the wastewater management system. The EPA matrix appears in Table 5.1 of this document.

The projected future expenditures driving the RI and imposing demands upon the financial capability of Bayonne will include the implementation of CSO controls, stormwater controls, conveyance / collection system rehabilitation, in addition to the current debt service and other operational, maintenance, and planned capital improvements to the Bayonne sewer system that have been identified and provided by the City for inclusion into this analysis.

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[3] November 24, 2014 memorandum from Ken Kopocis, Deputy Assistant Administrator, Office of Water (OW) and Cynthia Giles, Assistant Administrator, Office of Enforcement and Compliance (OECA) to Regional Administrators

[4] Combined Sewer Overflow Policy Section II-C(8) 59 FR 18694

[5] "Schedules for implementation of the long-term CSO control plan may be phased based on the relative importance of adverse impacts upon water quality standards and designated uses, and on a permittee's financial capability." (59 FR 18688)

2.3 Limitations to the EPA Analytical Framework

EPA's 1997 financial capability guidance calls for the use of a simplistic "snap shot" model which assumes that all future expenditures are incurred simultaneously and that costs and incomes should be based on current dollars. This approach has the advantage of eliminating the need to estimate future rates of inflation and income growth. However, this approach can understate the affordability impact of long-term programs since income growth has not kept pace with and is not projected to keep pace with water utility capital and O&M cost inflation. For example, for the period of 1999 through 2013, the national costs for typical household wastewater services increased at a rate of 4.8%.[6] The national Consumer Price Index increased at an annual rate of around 2.4%[7] for the period while the US median household income increased from around $42,000 to $52,250 at an annual rate of 1.6%.[8]

An affordability analysis that does not account for the continuing divergence between wastewater utility costs and income growth over course of a long term implementation schedule will overstate the "affordability" of the LTCP as future costs are recovered from the residential and other system users. Conversely, including current permittee expenditures or debt service payments which would end before the costs from the CSO controls are paid can understate future affordability.

EPA's November 24, 2014 memorandum encourages the use of a time-based ("dynamic" model per the memo) model to supplement the snapshot approach. PVSC has developed a time-based model that calculates annual costs and revenue requirements based on assumed program costs, schedules and economic variables such as interest and inflation rates. The residential indicator is calculated for each year based upon the costs per typical residential users which changes annually based on the annual system revenue requirements.

An additional limitation to the EPA methodology is its focus on the median household income (MHI) which therefore does not address the affordability impacts of wastewater service costs on the lower income households in Bayonne's or any service area. By definition, one half of the households in Bayonne would be paying more than 1.0% of their household income for wastewater services when the residential indicator for the MHI equals 1.0%.

Three of the six EPA financial capability metrics focus on general obligation (G.O.) bond rating criteria which are amortized through property tax or other general revenue streams:

- Overall Net Debt as a Percentage of Full Market Property Value;
- Property Tax Revenues as a Percent of Full Market Property Value; and
- Property Tax Revenue Collection Rate.

The assumption that G.O. bonds will be used would not be appropriate for financing by municipal authorities.

6 NACWA 2013 Cost of Clean Water Index

7 US Bureau of Labor Statistics

8 US Census

For this analysis only, it is assumed that financing through the New Jersey Environmental Finance Program will be used as necessary to meet projected construction draw requirements. The actual size and timing of financing necessary to implement the CSO controls will be determined by the eventual construction schedules for the various components of the CSO Controls and other wastewater capital improvement needs and are therefore beyond the scope of this document.

In addition to following guidelines for the affordability and financial capability metrics, EPA encourages inclusion of any information that would have a financial impact on the permittee in the capability report. This assessment, therefore, includes additional discussion of socioeconomic trends in Bayonne because of the financial challenges that the municipality faces.

3.0 Affordability Assessment

3.1 Baseline (2020) Wastewater Services Affordability

The Residential Indicator is an approximation of households' abilities to pay their total wastewater costs and is derived by dividing the total annual wastewater costs for the typical household within the permittee's (Bayonne's) service area by the median household income within the service area. The Residential Indicator is compared to EPA-defined criteria to determine whether total annual wastewater costs impose a low, mid-range, or high impact on residential users. Table 3-1 shows U.S. EPA's Residential Indicator criteria, which define a "low" impact as a cost per household (CPH) less than 1.0% median household income (MHI), a "mid-range" impact between 1.0 and 2.0%, and "high" impact as greater than 2.0% of MHI.

Table 3-1. EPA Residential Indicator

Residential Indicator	Cost per Household
Low Burden	Less than 1.0 percent of MHI
Mid-Range Burden	1.0-2.0 percent of MHI
High Burden	Greater than 2.0 percent of MHI

The estimated annual cost for wastewater services for a typical single-family residential user for 2020 is $650. Based on the estimated MHI of $59,900 the Residential Indicator is approximately 1.2%, or at the border between what the EPA guidance defines as a low burden and a medium burden. By definition the current residential indicator for one half of the households is greater than the 1.2%.

In 2017 15.7% of the population in Bayonne was living below the poverty line. This compares to the national average poverty rate of 14.6%. The total Census households are broken out by income brackets on Table 3-2 below, along with the respective current Residential Indicators by income bracket. The RI for each bracket was calculated from the mid-point income within the bracket. At the lowest income levels, the current RI is already between 3.5% and 14.0%.

Table 3-2. Analysis of the Current Residential Indicator

Income Bracket	Households		Bracket Average Income	Bracket RI at Typical Cost per Household
	Number	Cumulative		
Less than $10,000	2,189	2,189	$5,000	14.0%
$10,000 to $14,999	1,061	3,250	$12,500	5.6%
$15,000 to $24,999	2,403	5,653	$20,000	3.5%
$25,000 to $34,999	2,410	8,063	$30,000	2.3%
$35,000 to $49,999	3,046	11,109	$42,500	1.7%
$50,000 to $74,999	4,496	15,605	$62,500	1.1%
$75,000 to $99,999	2,826	18,431	$87,500	0.8%
$100,000 to $149,999	3,302	21,733	$125,000	0.6%
$150,000 to $199,999	2,011	23,744	$175,000	0.4%
$200,000 or more	1,469	25,213	$200,000	0.4%
Total	25,213			

3.2 Affordability Impacts of the Selected CSO Control Alternatives

Bayonne has identified a long term CSO control strategy that will achieve 85% capture of wet weather flows during the typical year. These controls are summarized on Table 3-3.

Table 3-3 – Bayonne's Selected CSO Controls

CSO Control Element	17 MGD Conveyance to PVSC		27 MGD Conveyance to PVSC	
	Capital Cost ($ millions)	*Incremental Annual O&M*	*Capital Cost ($ millions)*	*Incremental Annual O&M*
Green Infrastructure				
Phase 1 GI	$5.2	$30,000	$5.2	$30,000
Phase 2 GI	$5.2	$30,000	$5.2	$30,000
Phase 3 GI	$5.2	$30,000	$5.2	$30,000
Subtotal GSI	$15.6	$90,000	$15.6	$90,000
OSPS Improvements	$12.0	$600,000	$12.0	$600,000
Forcemain Capacity Increase			$23.0	$60,000
Storage Tanks				
BA010	$18.2	$69,000		$0
BA015	$32.2	$93,000	$32.2	$93,000
BA007	$47.5	$115,000	$47.5	$115,000
BA017	$26.8	$85,000	$26.8	$85,000
BA021	$32.2	$93,000	$32.2	$93,000
BA014	$18.2	$69,000		$0
BA001/002	$160.6	$219,000	$131.6	$20,000
Totals	**$363.1**	**$1,432,000**	**$320.8**	**$1,156,000**

Implementation of the $363 million 17 MGD (conveyance to PVSC) Bayonne Municipal Control Alternative results in projected annual costs per typical single family user of $1,336 (without inflation) and works out to a residential indicator of 2.4% in 2051, the first year after the

projected full implementation of the controls ending in 2050. Accounting for inflation, annual costs would grow to $3,825 with a residential indicator of 3.6% in 2051 as shown in Table 3-4.

Implementation of the $321 million 27 MGD (conveyance to PVSC) Bayonne Municipal Control Alternative results in projected annual costs per typical single family user of $1,222(without inflation) and works out to a residential indicator of 2.2% in 2051. With inflation, annual costs would grow to $3,642 with a residential indicator of 3.5% in 2051 also as shown in Table 3-4.

Table 3-4 – Bayonne Projected Residential Indicator Upon Full Implementation of the Municipal Control Alternative

Metric	Baseline (2020)	Cost per Typical Residential Wastewater User in 2051					
		No LTCP		With 17 MGD Conveyance ($363 million capital costs)		With 27 MGD Conveyance ($321 million capital costs)	
		With Inflation	Without Inflation	With Inflation	Without Inflation	With Inflation	Without Inflation
RI	1.2%	2.2%	1.2%	3.6%	2.4%	3.5%	2.2%
Annual $	$701	$2,298	$701	$3,825	$1,336	$3,642	$1,222

Key points from Table E-1 are:

- The base year (2020) cost per typical single family wastewater user in Bayonne is $650. Based on an estimated 2020 median household income of $59,900 this works out to a RI of 1.2%.
- The annual costs per typical single family user is projected to increase to $2,298 in 2051 due to inflation. This represents a residential indicator of 2.2%. Therefore, the projected cost per single family user is projected to exceed EPA's high burden threshold without any additional costs for CSO controls if inflation is assumed.
- Implementing a $363 million or $321 million Municipal Control Alternative with capital costs completed in 2005 years would result in annual costs per typical single family user of $3,825 and $3,642 respectively which work out to residential indicators of 3.6% and 3.5% respectively.
- The analysis does not reflect the current and lingering financial impacts as a result of the COVID -19 pandemic and should be revisited upon finalizing the LTCP implementation schedule.

3.3 Underlying Assumptions

Key assumptions used in the above analysis are summarized on Table 3-5. An annotated complete list of all data and assumptions used in the affordability model is provided as an appendix to this memorandum.

Table 3-5 – Affordability Model Key Inputs and Assumptions

Item	Value	Notes
Finance		
Bond Term (years)	30	
Market Interest Rate	6.0%	NJEIT Financing – Smart Growth program offers 75% funding at 0% interest and 25% funding at market rates for 20 years for CSO control projects.
NJDEP	0.0%	
Blended Interest Rate	1.5%	
Target Coverage	125.00%	
O&M as % of Capital Cost	1.0%	
Economic		
LTCP O&M Inflation	3.9%	Based on national rates of wastewater system O&M costs in 2017 NACWA study.
LTCP Construction Inflation	3.7%	Based on 1984 – 2015 ENR Construction Cost Index for New York City (80%) and Philadelphia (20%).
Estimate Base Year		
Demographic		
Bayonne Residential Connections		Municipal account data
Bayonne MHI in 2017	$56,700	American Community Survey Five Year Estimate 2013 – 2017

4.0 Analysis of Financial Capability Indictors

The second part of the financial capability assessment - calculation of the financial capability indicator for the permittee - includes six items that fall into three general categories of debt, socioeconomic, and financial management indicators. The six items are:

- Bond rating
- Total net debt as a percentage of full market real estate value
- Unemployment rate
- Median household income
- Property tax revenues as a percentage of full market property value
- Property tax revenue collection rate

Each item is given a score of three, two, or one, corresponding to ratings of strong, mid-range, or weak, according to EPA-suggested standards. The overall financial capability indicator is then derived by taking a simple average of the ratings. This value is then entered into the financial capability matrix to be compared with the residential indicator for an overall capability assessment). Table 4-1 contains the six criteria and the ratings that categorize the permittee as strong, mid-range, or weak in each category. A discussion of each item follows.

Table 4-1 Permittee Financial Capability Indicator Benchmarks

Indicator	Strong (3)	Mid-Range (2)	Weak (1)
Bond Rating	AAA-A (S&P) or Aaa-A (Moody's)	BBB (S&P) or Baa (Moody's)	BB-D (S&P) of Ba-C (Moody's)
Overall Net Debt as a Percent of Full Market Property Value	Below 2%	2% to 5%	Above 5%
Unemployment Rate	More than 1% below the National Average	+/- 1% of the National Average	More than 1% above the National Average
Median Household Income	More than 25% above National MHI	+/- 25% above National MHI	More than 25% below National MHI
Property Tax as a Percent of Full Market Property Value	Below 2%	2% to 4%	Above 4%
Property Tax Collection Rate	Above 98%	94% to 98%	Below 94%

4.1 Bond Rating – Indicator 1

Bayonne's current bond rating is A3 (Moody's Investors Services) However, the A3 rating is the lowest rung of above "BBB" ratings and is more appropriately considered as "mid-range". Bayonne has struggled with a structural deficit for 2 decades which has been as high as $35 million and now is in the $15 million range. Bayonne is teetering on the verge of a "BBB" rating and not "strong" as to a ratings analysis.

4.2 Overall Net Debt as a Percent of Full Market Value – Indicator 2

Debt Burden is measured by overall net debt as a percent of full market property value, which evaluates the ability of local government to issue additional debt. For this analysis, the three year average property valuation ($5.34 billion) provided in the NJDCA User Friendly Budget (UFB-10) is used. Overall Net Debt is defined as current total liability to be repaid by property taxes divided by the municipality's full market property value. This indicator is relevant as a metric for municipalities issuing general obligation bonds which are substantially repaid through property tax revenues.

Overall net debt includes overlapping debt, which is the indebtedness of Bayonne, the School District of Bayonne and that of Hudson County as well as the debt burden associated with the Public-Private Partnership of approximately $150 million. The Bayonne General Bonded Debt totaled $309.4 million.[9] The percent of total net debt to full market value was 5.8%. Overall net debt as a percent of full market property value places Bayonne in the weak range on this measure.

[9] Source: 2017 NJDCA User Friendly Budget – Sheet UFB-10.

4.3 Unemployment Rate – Indicator 3

The unemployment rate is used as an assessment of the economic well-being of residential users in the service area. The dataset for the municipal unemployment rates is taken from the US Census American Community Survey 2013-2017 estimates. The American Community Survey gathers data over a 5-year period.

The prevailing unemployment rate provided by the ACS for that timeframe more closely represents the actual strength of the economy in a municipality. The 2013 – 2017 ACS unemployment rate for Bayonne was 4.1% compared to the national rate of 6.6% for the same time period. This results in a strong rating per the EPA table. It should be noted that the above statistics are for Bayonne and should not be confused with Bureau of Labor Statistics data for the New York – Bayonne SMSA.

4.4 Median Household Income – Indicator 4

Median Household Income (MHI) divides the relevant incomes of a population into two parts so that half of the incomes are below the median and half of the incomes are above the median. Unlike average income, median income is not skewed by extremely high or extremely low incomes in the dataset. Table 4-2 shows that the MHI within the Bayonne is close to the national value, resulting in a mid-range rating per the EPA metric.

Table 4-2 Median Household Income

	2017 Median Household Income[10]
Bayonne	$56,700
United States	$57,650
% Difference	-1.65%
Categorization	Mid-Range

4.5 Property Tax Revenues as a % of Full Market Value – Indicator 5

The three-year equalized value of taxable property in Bayonne is $5.34 billion based on the 2017 User Friendly Budget. Total property taxes from all jurisdictions were $172.4 million Therefore, the property tax levy is approximately 3.2% of the three-year average equalization value provided on the municipal information sheet; which is considered as mid-range under the EPA criteria. The EPA financial capability assessment makes no provision for measuring a local tax burden other than the real estate tax. This gives Bayonne an artificially higher rating in the property tax revenues as a percent of full market value category, as Bayonne is the only municipality within New Jersey with a local income tax.

[10] Source: US Census – National Community Survey estimates for 2013 - 2017

4.6 Property Tax Collection Rate – Indicator 6

The EPA criterion for a strong rating in this category is a collection rate of more than 98%. Bayonne's rate is estimated to be 99.1%, which places it in the strong range for real estate tax collections.

4.7 Financial Indicator Score

As shown on Table 4-3, the overall score for the financial indicators is 2.5 yielding an EPA Qualitative Score of "mid-range". This calculation is based on the use of six of the six indicators that are applicable to Bayonne.

Table 4-3 – Permittee Financial Capability Indicator Benchmarks

Indicator	Rating	Numeric Score
Bond Rating	Mid-Range	2
Overall Net Debt as a Percent of Full Market Property Value	Weak	1
Unemployment Rate	Strong	3
Median Household Income	Mid-range	2
Property Tax as a Percent of Full Market Property Value	Mid-Range	2
Property Tax Collection Rate	Strong	3
	Total	13
Overall Indicator Score: (numeric score / number of applicable indicators)		2.2
	EPA Qualitative Score	Mid-Range

5.0 Financial Capability Matrix

In this section the results of the step 1 affordability analysis which goes towards the residential ratepayers' ability to afford CSO controls within the context of other capital investment needs is integrated with the step 2 (Financial Capability) analysis which goes towards the permittee's ability to finance the implementation of the LTCP.

It was established previously that capital expenditures for the Bayonne Municipal Control Alternative of approximately $321 or $363 million over a thirty-year implementation period would result in a Residential Indicator significantly exceeding the 2.0% EPA threshold for high burden using the dynamic model.

The overall Bayonne financial capability rating considered to be midrange under the EPA framework. The intersection of these two ratings on the EPA financial capability matrix places the Bayonne sewer system in the category of high financial burden, as shown on Table 5-1.

Table 5.1 The Financial Capability Matrix - (Shaded areas Indicate Bayonne's Ratings)

Permittee Financial Capability Indicators Score	Residential Indicator		
(Socioeconomic, Debt and Financial Indicators)	Low (Below 1.0%)	Mid-Range (Between 1.0 and 2.0%)	High (Above 2.0%)
Weak (Below 1.5)	Medium Burden	High Burden	High Burden
Mid-Range (Between 1.5 and 2.5)	Low Burden	Medium Burden	**High Burden**
Strong (Above 2.5)	Low Burden	Low Burden	Medium Burden

6.0 Additional Economic Factors

In addition to following EPA guidelines for completion of the financial capability assessment matrix, a discussion of socioeconomic trends in the Bayonne sewer system area is essential to the consideration of scheduling and compliance levels with CSO guidelines.

6.1 Cost of Living Factors

6.1.1 Cost of Living Index

The residents of Bayonne face relatively high cost of living compared to other areas in the United States. A published cost of living index was used to determine the relative cost of living in Bayonne compared to national averages.[11] The cost of living in Bayonne is approximately 30% higher than the national average. The estimated U.S. median household income in 2017 was approximately $57,650 or 1.68% higher than the Bayonne MHI. Thus, the household at the median Bayonne household income faces costs of living that are 30% higher than the national average while earning an income that is about 98% of the national median income.

6.1.2 Housing Costs

One of the major drivers in the higher cost of living in Bayonne is the cost of housing. Housing costs in Bayonne are approximately 169% higher than the national average. The Residential Indicator is a national screening parameter and does not account for localized factors which erode the effective household income. Based upon a 2017 study[12] by the National Low Income Housing Coalition, the fair market value of a two bedroom apartment in Hudson County was $1,519 per month which works out to 32% of the median household income.

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[11] http://www.infloplease.com/business/economy/cost of living - index.us-cities html

[12] Out of Reach 2017 – The High Cost of Housing National Low Income Housing Coalition.

6.1.3 Local Tax Burdens

The property tax burdens within the combined sewered municipalities of the PVSC service area are substantial. Based on the 2017 average residential assessment in Bayonne of $123,000 the average residential taxpayer impact was $9,784.[13]

This compares with a national average local property tax levy of $3,500 for a similarly priced home. Moreover, as housing prices are higher in the New York – Newark metropolitan area than nationally, houses costing well over the national median value of $193,500 are purchased by families of modest incomes.

The high housing costs and tax burdens facing Bayonne households reduces their effective household income. Consequently, measuring the household burden imposed by wastewater costs as a percentage of the median household income may underestimate the financial burden of the projected wastewater costs per household. As was noted in an analysis of the impacts of CSO controls in the Boston region:

> *"The greater are the costs of other necessities as a share of MHI, the greater will be the economic burden associated with sewer charges equal to a given percent of MHI."* [14]

6.2 Poverty Factors

6.2.1 Poverty Rate

In 2017 15.7% of the population in Bayonne was living below the poverty line. This compares to the national average poverty rate of 14.6%.

6.2.2 Household Income Brackets (Program Capital Costs @ $363 million)

When the Residential Indicator is 3.6% of median household income as projected for the 17 MGD conveyance alternative, by definition half of the households in Bayonne would be paying more than 3.6% of their household incomes for wastewater services. Wastewater costs resulting in a high residential indicator at the median household income would impose severe impacts on low income households. As shown on Table 6-1 around 8,100 households representing a population of 21,400 would be paying over 7.0% percent of their household incomes for wastewater services as a result of implementation of the Municipal Control Alternative assuming that inflation is factored into the calculation.

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[13] NJDCA 2017 User Friendly Budget – Sheet UFB-1

[14] Assessment of the Economic Impact of Additional Combined Sewer Overflow Controls in the Massachusetts Water Resource Authority Service Area (page 13) prepared by Robert N. Stavins, Genia Long, and Judson Jaffee. Analysis Group Incorporated, August 2004.

Table 6-1 – Impact of the Municipal Control Alternative on the Residential Indicator

Income Bracket	Households		Estimated Population		RI @ Resulting from $363 Million in Capital Expenditures Through 2050	Bracket Average Income
	Number	Cumulative	Number	Cumulative		
Less than $10,000	2,189	2,189	5,793	5,793	42.6%	$5,000
$10,000 to $14,999	1,061	3,250	2,808	8,600	17.1%	$12,500
$15,000 to $24,999	2,403	5,653	6,359	14,959	10.7%	$20,000
$25,000 to $34,999	2,410	8,063	6,377	21,336	7.1%	$30,000
$35,000 to $49,999	3,046	11,109	8,060	29,397	5.0%	$42,500
$50,000 to $74,999	4,496	15,605	11,897	41,294	3.4%	$62,500
$75,000 to $99,999	2,826	18,431	7,478	48,772	2.4%	$87,500
$100,000 to $149,999	3,302	21,733	8,738	57,510	1.7%	$125,000
$150,000 to $199,999	2,011	23,744	5,322	62,832	1.2%	$175,000
$200,000 or more	1,469	25,213	3,887	66,719	1.1%	$200,000
Total	25,213		66,719			

6.2.2 Income Growth Trends

The Bayonne MHI growth was about 1.84% average annually 2000 to 2017. This is somewhat lower than the 1.9% growth rates for New Jersey and the U.S. for the same period.

6.2.3 New Jersey Department of Community Affairs Municipal Revitalization Index

New Jersey's Municipal Renewal Index[6-15] measures the social, economic, physical and financial conditions of the 565 municipalities within New Jersey. The MRI is compiled by the NJ Department of Community Affairs and is used in the distribution of needs based funding. Six primary along with four secondary criteria are used:

Primary Criteria

- Children on TANF (Temporary Assistance for Needy Families) per 1,000 persons
- Unemployment Rate
- Poverty Rate
- High school diploma or higher

[6-15] Measuring Distress in New Jersey: the 2017 Municipal Revitalization Index Office of Policy and Regulatory Affairs, New Jersey Department of Community Affairs.

- Median Household Income
- Percent of households receiving SNAP (food stamps)

Secondary Criteria

- Ten year rate of change in population
- Non-seasonal housing vacancy rate
- Equalized three year effective property tax rate
- Equalized property valuation per capita

The 2017 state-wide MRI rankings for the combined sewered municipalities within the PVSC service area are shown on Table 6-2. The City of Bayonne has a ranking of 82th most distressed municipality out of 565 statewide.

Table 6-2 – Municipal Renewal Index for the PVSC Combined Sewered Municipalities

Municipality	2017 Municipal Revitalization Index			Percentile of Least Resourced Municipalities
	MRI Score	MRI Distress Score	MRI Rank	
Bayonne	**-4.56**	**40.2**	**82**	**15%**
East Newark	-5.71	43.4	65	12%
Guttenberg	-5.12	41.8	70	12%
Harrison	-4.49	40.0	87	15%
Jersey City	-5.80	43.7	64	11%
Kearny	-3.67	37.7	106	19%
Newark	-16.53	73.5	12	2%
North Bergen	-4.65	40.5	80	14%
Paterson	-19.43	81.6	8	1%

6.3 Demographic Trends

6.3.1 Municipal Population Trends

Bayonne has experienced a modest population increase from 61,242 in 2000 to 63,024 in 2010.

6.3.2 Household Number Trends

The number of households declined slightly from 25,545 in the 2000 Census to the current 25, 213.

6.4 Implications of the Additional Economic Factors

The additional economic factors presented above were intended to provide additional context to the affordability and financial capability scores determined in this initial FCA. The context of this FCA and of the implementation of the LTCP is a combined sewered community with household incomes well below the federal and state levels, high poverty rates, and high local tax burdens. Bayonne is and is likely to remain financially distressed due to structural economic factors beyond its direct control and its ability to afford and finance future CSO control facilities is restricted.

7.0 Potential Impacts of the COVID-19 Pandemic on Affordability

The projections and conclusions concerning the affordability of the CSO control program proposed in this SIAR by the City of Bayonne and Bayonne's financial capability to finance the CSO control program are premised on the baseline financial conditions of Bayonne as well as the economic conditions in New Jersey and the United States generally at the time that work on this SIAR commenced. While the impacts of the pandemic on the long-term affordability of the CSO LTCP are obviously still unknown, it is reasonable to expect that there will be potentially significant impacts. There are several dimensions to these potential impacts, including reduced utility revenues and household incomes.

7.1 Potential Wastewater Utility Revenue Impacts

This Financial Capability Assessment cannot reflect the currently unknowable impacts on wastewater utility revenues stemming from the national economic upheaval resulting from the COVID-19 pandemic. It is however extremely likely that Bayonne and municipal wastewater utilities in general across the United States will face significant and potentially permanent declines in revenues from households unable to pay their water and sewer bills and the sudden decline in industrial and commercial demands for potable water and wastewater treatment.

On March 20, 2020 the National Association of Clean Water Agencies (NACWA) issued a press release stating that:

> **"NACWA conservatively estimates the impact to clean water utilities nationwide of lost revenues due to coronavirus at $12.5 Billion.** This is a low-end estimate, assuming an average loss of revenue of 20% which is well within the range of what individual utilities are already projecting. Some utilities are anticipating closer to a 30% or 40% loss in revenue. This estimate is based on the substantial historical utility financial data NACWA has on file through its Financial Survey and recent reports from NACWA members on the decrease in usage they are observing in their systems over the last few weeks."[16]

The impact of a 20% to 40% revenue loss, along with increased costs that have been and will continue to be experienced by water and wastewater utilities such as overtime and the writing off of customer accounts receivable could have a profound impact on the affordability of the proposed CSO controls and Bayonne's ability to finance them.

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16 NACWA press release: Coronavirus Impacting Clean Water Agencies; Local Utilities and Ratepayers Need Assistance March 20, 2020

Most of the costs of a municipal wastewater system are relatively fixed within broad operating ranges. Debt service and other capital costs are fixed once incurred. Some operating costs are somewhat variable with wastewater flows, e.g. chemical and electrical power usage but this variability is lessened by the reality that inflow, infiltration and stormwater flow in a combined system are not affected by billed water consumption. Labor costs are not directly variable, e.g. a twenty percent reduction in billed flow would not result in a need for twenty percent less labor. Maintenance costs might go down somewhat as equipment operating times may be reduced.

As costs do not decline proportionately to billed flow, it can be expected that user charge rates must be raised to generate sufficient revenue to sustain current operations. The relationship between changes in costs and revenues and the resultant changes in user charge rates is complex and has not yet been fully analyzed. At this point it can be assumed that user rate increases may be necessary to simply maintain current operations, and these rate increases will likely erode the financial capability of Bayonne to fund the CSO LTCP.

7.2 Potential Median Household Income Impacts

The impacts of the pandemic on median household incomes in Bayonne cannot be determined at this point. Historical analogies may provide some useful, albeit disturbing, context but are not presented as predictive:

- U.S. median household income fell by 6.2% from $53,000 in 2007 to $49,000 in 2010. In New Jersey, the MHI decreased by around 4.0% for the same period.[17]
- The U.S. unemployment rates rose from 5.0% in December of 2007 to 9.9% in December of 2009.[18]
- Data on impacts of the Great Depression on median household income are not available. As a proxy, the personal income per capita data are available. For 1929 this was $700. By 1933 this figure bottomed out at $376, a decline of 46%. Unemployment for the same period rose from around 3.0% to 25%.[19]

While a quantifiable assessment of the impact of the pandemic on median household income is not feasible at this time, reduction in base year MHI can be expected. This will further exacerbate the impacts of the revenue reductions described above on LTCP affordability, as higher base user charge rates will absorb an increased portion of lower MHI.

7.3 Implications for the Long Term CSO Control Program

Bayonne anticipates that the financial implications of the COVID-19 pandemic will be discussed with NJDEP during the review of the SIAR and as the 2021 – 2025 NJPDES permit is developed. Based on the October 1, 2020 revised due date for the SIAR, additional revenue data should be available to support a more specific refinement of this analysis in the SIAR.

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17 Source: Fact Sheet: Income and Poverty Across the States, 2010 Joint Economic Committee, United States Congress, Senator Robert P. Casey, Jr. Chairman.

18 Source: Bureau of Labor Statistics data series LNS1400000

19 Source: Federal Reserve Economic Data (FRED) data series: A792RC0A052NBEA

Given the current and likely continuing uncertainties as to the New Jersey and national economic conditions, Bayonne will be reticent to commit to long term capital expenditures for CSO controls without the incorporation of adaptive management provisions, including provisions to revise and reschedule the long term CSO controls proposed in this SIAR based on emergent economic conditions beyond the permittees' control. As detailed in Section F of Bayonne's SIAR, these provisions could include scheduling the implementation of specific CSO control measures to occur during the five year NJPDES permit cycles. A revised affordability assessment should be performed during review of the next NJPDES permit to identify controls that are financially feasible during that next permit period.

8.0 Conclusion

The affordability analysis detailed above has documented that a $321 or $363 million (current dollars) Municipal Control Alternative documented in Bayonne's SIAR along with related operation and maintenance costs would result in very high Residential Indicators at 3.5% to 3.6%.

The reality of the high poverty rates, low household incomes compared to the rest of New Jersey and nationally and the high costs of living in Bayonne argue strongly that the EPA metric understates the impacts of the CSO control costs on the residents of the City. While having a relatively high current median household income; structural financial limitations facing the City of Bayonne and the high projected (current dollar) cost of the Municipal Control Alternative CSO controls are projected to result in untenably high household burdens at between 3.5% and 3.6% assuming inflation. Even if inflation is not factored into the analysis, the resulting residential indicators ranging from 2.2% to 2.4% would be well over the 2.0% high burden threshold.

Memorandum

To: *Borough of East Newark, New Jersey*

Copy: *Thomas Laustsen, Sheldon Lipke, Mike Hope, Tim Dupuis, Scott Craig*

From: *Tom Schevtchuk*

Date: *September 26, 2020*

Subject: *Final Financial Capability Assessment for East Newark*

1.0 Executive Summary

This Financial Capability Analysis (FCA) memorandum is in support of the Municipal Control Alternative identified in the Selection and Implementation of Alternatives (SIAR) developed by the Borough of East Newark. It quantifies the projected affordability impacts of East Newark's proposed long term CSO controls for the East Newark combined sewer system (CSS) and updates the 2019 preliminary FCA memo that was intended to guide the development and selection of long term controls.

As summarized in Table E-1, this FCA includes the projected impacts if the Municipal Control Alternative are undertaken by East Newark based on the costs and programs included in East Newark's SIAR Section F.

Table E-1 - Projected Impacts of CSO Controls at a Glance

Typical Household 2019	
Annual Wastewater Costs	$436
Residential Indicator (RI)*	0.7%
Median Household Income (MHI)	$61,400
LTCP Control Program	
CSO Control Capital Costs ($ millions)	$6.0
First Year After Full Implementation	2031
LTCP Impact on Typical Household Cost in	2031
Median Household Income (MHI)	$75,400
Annual Costs Without LTCP	$595
Residential Indicator	0.8%
Annual Costs With LTCP	$1,191
Residential Indicator	1.6%

* Percent of median household income spent for wastewater services.

While a regional alternative would result in lowered overall costs for the control of CSOs within the PVSC service area, the basis of this allocation remains under discussion as of the writing of this memorandum. Under this approach, both the costs of the regional facilities such as a relief interceptor and the resultant savings would be allocated amongst the PVSC municipalities with combined sewer systems. As the basis of this allocation remains under discussion as of the writing of this SIAR, this FCA memorandum focuses on implementation of the Municipal Control Alternative. Should the permittees come to agreement on the cost allocation for the Regional Control Plan, the FCA will be revisited to reassess the affordability and schedule for implementation of the LTCP.

The Financial Capability assessment is a two-step process including ***Affordability*** which evaluates the impact of the CSO control program on the residential ratepayers and ***Financial Capability*** which examines a permittee's ability to finance the program. Affordability is measured in terms of the Residential Indicator (RI) which is the percentage of median

household income spent on wastewater services. Total wastewater services exceeding 2.0% of the median household income are considered to impose a high burden by USEPA. The financial capability analysis uses metrics similar to the municipal bond rating agencies.

The 2019 preliminary FCA determined that future capital expenditures for CSO controls and all other capital expenditures of approximately $5.6 million (current dollars) over a twenty-year period (2022 through 2041) would result in a RI exceeding 2.0% using a dynamic (time sensitive) model which accounts for future inflation. Along with the calculated debt service costs associated with the$5.6 million in capital costs an annual incremental operations and maintenance (O&M) cost of $120,000 or 2.0% of the capital cost value was estimated.

East Newark's SIAR projects future capital costs for the Municipal Control Alternative totaling $6.0 million through 2030. No incremental annual O&M costs were identified. This would result in a projected residential indicator in 2031 the first year after full implementation of the controls of 1.6% which would constitute the high end of a medium burden under the USEPA analytical guidelines.

The second step of the financial capability analysis documents that East Newark's current financial capability strength is "mid-range". These two metrics combine on EPA's Financial Capability Matrix to indicate a medium burden under the USEPA guidance when the $6.0 million in capital expenditures proposed under East Newark's Municipal Control Alternative.

This draft memorandum is based on information provided by East Newark, PVSC and external sources such as the on-line fiscal reports available through the New Jersey Department of Community Affairs.[1]

The projections and conclusions concerning the affordability of the CSO control program proposed in this SIAR by East Newark and East Newark's financial capability to finance the CSO control program are premised on the baseline financial conditions of East Newark as well as the economic conditions in New Jersey and the United States generally at the time that work on this SIAR commenced. While the impacts of the pandemic on the long-term affordability of the CSO LTCP are obviously still unknown, it is reasonable to expect that there will be potentially significant impacts. There are several dimensions to these potential impacts, including reduced utility revenues and household incomes.

2.0 Introduction

2.1 Intent of the Financial Capability Analysis

This document presents the final Financial Capability Analysis (FCA) relating to the development of the CSO Long Term Control Plan (LTCP) required under Paragraph G(8)(a) of the Combined Sewer Management section of a permittee's NJPDES discharge permit. The assessment is based upon the EPA document "Combined Sewer Overflows – Guidance for Financial Capability Assessment and Schedule development," (EPA Guidance Document) published February 1997[2], as supplemented by EPA's November 2014 memorandum entitled

[1] https://www.nj.gov/dca/divisions/dlgs/resources/fiscal_rpts.shtml

[2] EPA 832-B-97-004

"Financial Capability Assessment Framework for Municipal Clean Water Act Requirements".[3] A preliminary FCA memorandum was provided by PVSC to East Newark and the other combined sewered permittees within its service area in August of 2019, with a subsequent update in December of 2019.

This final FCA and last year's preliminary version support the twofold purposes of the FCA as envisioned in the 1994 CSO Control Policy[4] (Policy). First, the FCA is intended to identify the upper limits of what could constitute an affordable future investment strategy as defined by the Policy and related guidance documents under an assumed LTCP implementation schedule; thereby informing the development of CSO, SSO, MS4, TMDL, and other necessary control alternatives. Second, the financial and user cost (affordability) impacts of the selected CSO controls must be assessed to support the development of a workable implementation schedule for the LTCP.[5]

2.2 EPA's Two Step Analysis Process

The Financial Capability assessment is a two phased process. The residential indicator (RI) is the percentage of median household income (MHI) expended on wastewater (including stormwater) management. The upper limit of affordability for wastewater services within East Newark will be the point where total wastewater management costs for the typical residential user in East Newark exceed 2.0% of the Median Household Income (MHI). This metric of total wastewater management costs as a percentage of MHI is termed the Residential Indicator (RI) by USEPA.

The financial capability indicator is an assessment of East Newark's debt burden, socioeconomic conditions, and financial operations. These two measures are subsequently entered into a *financial capability matrix*, suggested by EPA, to determine the level of financial burden placed on residential customers and East Newark by the existing and projected future expenditures to operate, maintain, and enhance the wastewater management system. The EPA matrix appears in Table 5.1 of this document.

The projected future expenditures driving the RI and imposing demands upon the financial capability of East Newark will include the implementation of CSO controls, stormwater controls, conveyance / collection system rehabilitation, in addition to the current debt service and other operational, maintenance, and planned capital improvements to the East Newark sewer system that have been identified and provided by the Borough for inclusion into this analysis.

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[3] November 24, 2014 memorandum from Ken Kopocis, Deputy Assistant Administrator, Office of Water (OW) and Cynthia Giles, Assistant Administrator, Office of Enforcement and Compliance (OECA) to Regional Administrators

[4] Combined Sewer Overflow Policy Section II-C(8) 59 FR 18694

[5] "Schedules for implementation of the long-term CSO control plan may be phased based on the relative importance of adverse impacts upon water quality standards and designated uses, and on a permittee's financial capability." (59 FR 18688)

2.3 Limitations to the EPA Analytical Framework

EPA's 1997 financial capability guidance calls for the use of a simplistic "snap shot" model which assumes that all future expenditures are incurred simultaneously and that costs and incomes should be based on current dollars. This approach has the advantage of eliminating the need to estimate future rates of inflation and income growth. However, this approach can understate the affordability impact of long-term programs since income growth has not kept pace with and is not projected to keep pace with water utility capital and O&M cost inflation. For example, for the period of 1999 through 2013, the national costs for typical household wastewater services increased at a rate of 4.8%.[6] The national Consumer Price Index increased at an annual rate of around 2.6%[7] for the period while the US median household income increased from around $42,000 to $52,250 at an annual rate of 1.6%.[8]

An affordability analysis that does not account for the continuing divergence between wastewater utility costs and income growth over course of a long term implementation schedule will overstate the "affordability" of the LTCP as future costs are recovered from the residential and other system users. Conversely, including current permittee expenditures or debt service payments which would end before the costs from the CSO controls are paid can understate future affordability.

EPA's November 24, 2014 memorandum encourages the use of a time-based ("dynamic" model per the memo) model to supplement the snapshot approach. PVSC has developed a time-based model that calculates annual costs and revenue requirements based on assumed program costs, schedules and economic variables such as interest and inflation rates. The residential indicator is calculated for each year based upon the costs per typical residential users which changes annually based on the annual system revenue requirements.

An additional limitation to the EPA methodology is its focus on the median household income (MHI) which therefore does not address the affordability impacts of wastewater service costs on the lower income households in East Newark's or any service area. By definition, one half of the households in East Newark would be paying more than 1.0% of their household income for wastewater services when the residential indicator for the MHI equals 1.0%.

Three of the six EPA financial capability metrics focus on general obligation (G.O.) bond rating criteria which are amortized through property tax or other general revenue streams:

- Overall Net Debt as a Percentage of Full Market Property Value;
- Property Tax Revenues as a Percent of Full Market Property Value; and
- Property Tax Revenue Collection Rate.

The assumption that G.O. bonds will be used would not be appropriate for financing by municipal authorities.

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6 NACWA 2013 Cost of Clean Water Index

7 US Bureau of Labor Statistics

8 US Census

For this analysis only, it is assumed that financing through the New Jersey Environmental Finance Program will be used as necessary to meet projected construction draw requirements. The actual size and timing of financing necessary to implement the CSO controls will be determined by the eventual construction schedules for the various components of the CSO Controls and other wastewater capital improvement needs and are therefore beyond the scope of this document.

In addition to following guidelines for the affordability and financial capability metrics, EPA encourages inclusion of any information that would have a financial impact on the permittee in the financial capability analysis. This assessment, therefore, includes additional discussion of socioeconomic trends in East Newark because of the financial challenges that the municipality faces.

3.0 Affordability Assessment

3.1 Baseline (2019) Wastewater Services Affordability

The Residential Indicator is an approximation of households' abilities to pay their total wastewater costs and is derived by dividing the total annual wastewater costs for the typical household within the East Newark service area by the median household income within the service area. The Residential Indicator is compared to EPA-defined criteria to determine whether total annual wastewater costs impose a low, mid-range, or high impact on residential users. Table 3-1 shows U.S. EPA's Residential Indicator criteria, which define a "low" impact as a cost per household (CPH) less than 1.0% median household income (MHI), a "mid-range" impact between 1.0 and 2.0%, and "high" impact as greater than 2.0% of MHI.

Table 3-1. EPA Residential Indicator

Residential Indicator	Cost per Household
Low Burden	Less than 1.0 percent of MHI
Mid-Range Burden	1.0-2.0 percent of MHI
High Burden	Greater than 2.0 percent of MHI

3.1.1 Estimated Baseline (2019) Wastewater Cost Per Household

The estimated annual cost for wastewater services for a typical single-family residential user for 2019 is $436. This estimate is based on typical residential potable water usage is 4,500 gallons monthly. Based on the estimated MHI of $61,400 the Residential Indicator is approximately 0.7%, or at the border between what the EPA guidance defines as a low burden and a medium burden. By definition the current residential indicator for one half of the households is greater than the 0.7%.

In East Newark, 13% of the population was living below the poverty line. The total Census households are broken out by income brackets on Table 3-2 below, along with the respective current Residential Indicators by income bracket. The RI for each bracket was calculated from

the mid-point income within the bracket. At the lowest income levels, the current RI is already between 3.5% and 8.7%.

Table 3-2. Analysis of the Current Residential Indicator

Income Bracket	Households		Bracket Average Income	Bracket RI at Typical Cost per Household
	Number	Cumulative		
Less than $10,000	28	28	$5,000	8.7%
$10,000 to $14,999	44	72	$12,500	3.5%
$15,000 to $24,999	56	128	$20,000	2.2%
$25,000 to $34,999	86	214	$30,000	1.5%
$35,000 to $49,999	133	347	$42,500	1.0%
$50,000 to $74,999	156	503	$62,500	0.7%
$75,000 to $99,999	104	607	$87,500	0.50%
$100,000 to $149,999	140	747	$125,000	0.4%
$150,000 to $199,999	53	800	$175,000	0.3%
$200,000 or more	30	830	$200,000	0.2%
Total	830			

3.2 Affordability Impacts of the Selected CSO Control Alternatives

Permittee has identified a long term CSO control strategy that will achieve 85% capture of wet weather flows during the typical year. These controls are summarized on Table 3-3.

Table 3-3 – East Newark's Selected CSO Controls

Wet Weather Control Types	Capital Costs ($ millions)	Incremental Annual O&M Costs ($ millions)
Thread Mill Sewer Separation	$3.9	$0.0
Waterfront Sewer Separation	$2.1	$0.0
Total	$6.0	$0.0

Implementation of the $6.0 million Municipal Control Alternative results in projected costs per typical single family user of $901 (without inflation) and a residential indicator of 1.5% in 2031. Accounting for inflation, annual costs would grow to $1,191 with a residential indicator of 1.6% as shown in Table 3-4.

Table 3-4 – East Newark's Projected Residential Indicator Upon Full Implementation of the Municipal Control Alternative

Metric	Baseline (2019)	Cost per Typical Residential Wastewater User in 2031			
		No LTCP		Implementation Completed in 2030	
		With Inflation	Without Inflation	With Inflation	Without Inflation
RI	0.7%	0.8%	0.7%	1.6%	1.5%
Annual $	$436	$595	$414	$1,191	$901

Key points from Table E-1 are:

- The base year (2019) cost per typical single family wastewater user in East Newark was calculated to be $436 based on a monthly water consumption of 4,500 gallons. Based on a 2019 median household income of $61,400 this works out to a RI of 0.7%.
- The costs per typical single family user in East Newark is projected to increase to $595 annually without implementing the CSO controls due to inflation. This would result in a RI of 0.8%.
- Implementing a $6.0 million Municipal Control Alternative with capital costs completed in 2030 years would result in annual costs per typical single family user of $1,191 in 2031, which works out to a 1.6% RI.
- Excluding inflation, the projected cost per typical single family user with the CSO controls would be around $900 in 2031, a RI of 1.5%
- The analysis does not reflect the current and lingering financial impacts as a result of the COVID -19 pandemic and should be revisited upon finalizing the LTCP implementation schedule.

3.3 Underlying Assumptions

Key assumptions used in the above analysis are summarized on Table 3-5. An annotated complete list of all data and assumptions used in the affordability model is provided as an appendix to this memorandum.

Table 3-5 – Affordability Model Key Inputs and Assumptions

Item	Value	Notes
Finance		
Bond Term		
Market Interest Rate	6.0%	NJEIT Financing – Smart Growth program offers 75% funding at 0% interest and 25% funding at market rates for 20 years for CSO control projects.
NJDEP	0.0%	
Blended Interest Rate	1.5%	
Target Coverage	125.00%	
O&M as % of Capital Cost	1.0%	

Table 3-5 – Affordability Model Key Inputs and Assumptions

Item	Value	Notes
Economic		
LTCP O&M Inflation	4.0%	Based on national rates of wastewater system O&M costs in 2017 NACWA study.
LTCP Construction Inflation	3.7%	Based on 1984 – 2015 ENR Construction Cost Index for New York City (80%) and Philadelphia (20%).
Estimate Base Year		
MHI Data Year	2015	
Typical Household Monthly Consumption	4,500	Typical urban water consumption.

4.0 Financial Capability Indictors

The second part of the financial capability assessment - calculation of the financial capability indicator for the permittee - includes six items that fall into three general categories of debt, socioeconomic, and financial management indicators. The six items are:

- Bond rating
- Total net debt as a percentage of full market real estate value
- Unemployment rate
- Median household income
- Property tax revenues as a percentage of full market property value
- Property tax revenue collection rate

Each item is given a score of three, two, or one, corresponding to ratings of strong, mid-range, or weak, according to EPA-suggested standards. The overall financial capability indicator is then derived by taking a simple average of the ratings. This value is then entered into the financial capability matrix to be compared with the residential indicator for an overall capability assessment. Table 4-1 contains the six criteria and the ratings that categorize the permittee as strong, mid-range, or weak in each category. A discussion of each item follows.

Table 4-1 Permittee Financial Capability Indicator Benchmarks

Indicator	Strong (3)	Mid-Range (2)	Weak (1)
Bond Rating	AAA-A (S&P) or Aaa-A (Moody's)	BBB (S&P) or Baa (Moody's)	BB-D (S&P) of Ba-C (Moody's)
Overall Net Debt as a Percent of Full Market Property Value	Below 2%	2% to 5%	Above 5%
Unemployment Rate	More than 1% below the National Average	+/- 1% of the National Average	More than 1% above the National Average
Median Household Income	More than 25% above National MHI	+/- 25% above National MHI	More than 25% below National MHI

Indicator	Strong (3)	Mid-Range (2)	Weak (1)
Property Tax as a Percent of Full Market Property Value	Below 2%	2% to 4%	Above 4%
Property Tax Collection Rate	Above 98%	94% to 98%	Below 94%

4.1 Bond Rating – Indicator 1

As is common for smaller municipalities, East Newark does not have a bond rating.

4.2 Overall Net Debt as a Percent of Full Market Value – Indicator 2

Debt Burden is measured by overall net debt as a percent of the three year average property valuation ($125.2 million), which evaluates the ability of local government to issue additional debt. Overall Net Debt is defined as current total liability to be repaid by property taxes divided by the municipality's full market property value. This indicator is relevant as a metric for municipalities issuing general obligation bonds which are substantially repaid through property tax revenues.

Overall net debt includes overlapping debt, which is the indebtedness of East Newark, the School District of East Newark and that of Hudson County. The East Newark General Bonded Debt totaled $915,772 and there was no overlapping School District debt.[9] Overall net debt as a percent of full market property value was 0.73% which places East Newark in the strong range on this measure.

4.3 Unemployment Rate – Indicator 3

The unemployment rate is used as an assessment of the economic well-being of residential users in the service area. The U.S. EPA Guidance criteria for unemployment are described in Table 4-1, Unemployment Indicator Criteria.

The dataset for the municipal unemployment rates is taken from the US Census American Community Survey 2013-2017 estimates. The American Community Survey gathers data over a 5-year period. The prevailing unemployment rate provided by the ACS for that timeframe more closely represents the actual strength of the economy in a municipality. The unemployment rate for East Newark was 2.8% compared to the U.S. national rate of 6.6% for the same time period, resulting in a strong rating for this criteria.

4.4 Median Household Income – Indicator 4

Median Household Income (MHI) divides the relevant incomes of a population into two parts so that half of the incomes are below the median and half of the incomes are above the median. Unlike average income, median income is not skewed by extremely high or extremely low incomes in the dataset. Table 4-2 shows that the MHI within East Newark for the 2013 – 2017 period was slightly higher (+2.9%) than the national average, resulting in a mid-range rating per the EPA metric.

[9] Source: NJDCA 2017 User Friendly Budget Sheet # 10

Table 4-2 Median Household Income

	Median Household Income[10]
East Newark	$59,300
United States	$57,650
% Difference	+2.9%
Categorization	Mid-Range

4.5 Property Tax Revenues as a % of Full Market Value – Indicator 5

The three year equalized valuations of the taxable property in East Newark is $125.2 million.[11] A total tax by all taxing entities of $3.89 million is levied on the assessed valuation. Therefore, the property tax levy is approximately 3.0% of the three-year average equalization value provided on the municipal information sheet which represents a midrange rating.

4.6 Property Tax Collection Rate – Indicator 6

The EPA criterion for a strong rating in this category is a collection rate of more than 98%. East Newark's rate is estimated to be 96%, which places it in the midrange for real estate tax collections.

4.7 Financial Indicator Score

As shown on Table 5-3, the overall score for the financial indicators is 2.4, yielding an EPA Qualitative Score of Midrange. This calculation is based on the use of five of the six indicators that are applicable to East Newark.

Table 5-3 – East Newark Financial Capability Indicator Benchmarks

Indicator	Rating	Numeric Score
Bond Rating	Not Applicable	
Overall Net Debt as a Percent of Full Market Property Value	Strong	3
Unemployment Rate	Strong	3
Median Household Income	Midrange	2
Property Tax as a Percent of Full Market Property Value	Midrange	2
Property Tax Collection Rate	Midrange	2
	Total	12
Overall Indicator Score: (numeric score / number of applicable indicators)		2.4
	EPA Qualitative Score	Midrange

[10] Source: US Census – National Community Survey estimates for 2013 - 2017

[11] Source: 2017 User Friendly Budget Sheet UFB-1.

5.0 Financial Capability Matrix

In this section the results of the step 1 affordability analysis which goes towards the residential ratepayers' ability to afford CSO controls within the context of other capital investment needs is integrated with the step 2 (Financial Capability) analysis which goes towards the permittee's ability to finance the implementation of the LTCP.

It was established previously that the $6.0 million Municipal Control Alternative for East Newark would result in a projected 2031 Residential Indicator of 1.6% . This is at the high end of EPA's definition of a medium burden.

The overall East Newark financial capability rating considered to be a medium burden under the EPA framework. The intersection of these two ratings on the EPA financial capability matrix places the East Newark sewer system in the category of high financial burden, as shown on Table 5-1.

Table 5-1 The Financial Capability Matrix - (Shaded areas Indicate East Newark's Ratings)

Permittee Financial Capability Indicators Score	Residential Indicator		
(Socioeconomic, Debt and Financial Indicators)	Low (Below 1.0%)	Mid-Range (Between 1.0 and 2.0%)	High (Above 2.0%)
Weak (Below 1.5)	Medium Burden	High Burden	High Burden
Mid-Range (Between 1.5 and 2.5)	Low Burden	**Medium Burden**	High Burden
Strong (Above 2.5)	Low Burden	Low Burden	Medium Burden

6.0 Additional Economic Factors

In addition to following EPA guidelines for completion of the financial capability assessment matrix, a discussion of socioeconomic trends in the East Newark sewer system area is essential to the consideration of scheduling and compliance levels with CSO guidelines.

6.1 Cost of Living Factors

6.1.1 Cost of Living Index

Specific cost of living comparisons of East Newark compared to the rest of the United States are not available. However, the cost of living for the City of Newark is approximately 30% higher than the national average.[12] Using the City of Newark value as a proxy, the household at the

[12] http://www.infloplease.com/business/economy/cost of living - index.us-cities html

median East Newark household income faces costs of living that are about 30% higher than the national average while earning an income that is about 3% higher than the national median income. Put another way, adjusting for the cost of living, the effective MHI in East Newark is about 78% of the national MHI.

6.1.2 Housing Costs

One of the major drivers in the higher cost of living in East Newark is the cost of housing. Housing costs in East Newark are approximately twice the national average. The Residential Indicator is a national screening parameter and does not account for localized factors which erode the effective household income. Based upon a 2017 study[13] by the National Low Income Housing Coalition, the fair market value of a two bedroom apartment in Hudson County was $1,519 per month which works out to 31% of the median household income.

6.1.3 Local Tax Burdens

The property tax burdens within the combined sewered municipalities of the PVSC service area are substantial. Per the 2017 User Friendly Budget information the average residential municipal purpose tax levy was $10,792 and the total tax levy was $23,885. This compares with a national average local property tax levy of $3,500. Moreover, as housing prices are higher in the New York – Newark metropolitan area than nationally, houses costing well over the national median value of $193,500 are purchased by families of modest incomes.

The high housing costs and tax burdens facing East Newark households reduces their effective household income. Consequently, measuring the household burden imposed by wastewater costs as a percentage of the median household income may underestimate the financial burden of the projected wastewater costs per household. As was noted in an analysis of the impacts of CSO controls in the Boston region:

> *"The greater are the costs of other necessities as a share of MHI, the greater will be the economic burden associated with sewer charges equal to a given percent of MHI."* [14]

6.2 Poverty Factors

6.2.1 Poverty Rate

In 2017 around 13% of the population in East Newark was living below the poverty line. This compares to the national average poverty rate of 14.6%.

6.2.2 Household Income Brackets

When the Residential Indicator is 1.6% of median household income, by definition half of the households in East Newark would be paying more than 1.6% of their household incomes for

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13 Out of Reach 2017 – The High Cost of Housing National Low Income Housing Coalition.

14 Assessment of the Economic Impact of Additional Combined Sewer Overflow Controls in the Massachusetts Water Resource Authority Service Area (page 13) prepared by Robert N. Stavins, Genia Long, and Judson Jaffee. Analysis Group Incorporated, August 2004.

wastewater services. In areas with large percentages of low income households, the impacts of a 1.6% RI can be severe. As shown on Table 6-1 over 200 out of the 830 households would be paying over 3.0% of their household incomes for wastewater services.

Table 6-1 – Impact of the Municipal Control Alternative on the Residential Indicator

Income Bracket	Households		Estimated Population		RI at Bracket Income Average	Bracket Average Income
	Number	Cumulative	Number	Cumulative		
Less than $10,000	28	28	92	92	19.4%	$5,000
$10,000 to $14,999	44	72	144	236	7.8%	$12,500
$15,000 to $24,999	56	128	184	420	4.9%	$20,000
$25,000 to $34,999	86	214	282	703	3.2%	$30,000
$35,000 to $49,999	133	347	437	1,139	2.3%	$42,500
$50,000 to $74,999	156	503	512	1,651	1.6%	$62,500
$75,000 to $99,999	104	607	341	1,993	1.1%	$87,500
$100,000 to $149,999	140	747	460	2,453	0.8%	$125,000
$150,000 to $199,999	53	800	174	2,627	0.6%	$175,000
$200,000 or more	30	830	98	2,725	0.5%	$200,000
Total	830		2,725			

6.2.3 Income Growth Trends

The East Newark MHI growth between 2000 and 2015 was about 2% annually (1.96%). This is somewhat less than the growth rates for New Jersey (2.20%) and for the U.S. (2.14%).

6.2.3 New Jersey Department of Community Affairs Municipal Revitalization Index

New Jersey's Municipal Renewal Index[6-15] measures the social, economic, physical and financial conditions of the 565 municipalities within New Jersey. The MRI is compiled by the NJ Department of Community Affairs and is used in the distribution of needs based funding. Six primary along with four secondary criteria are used:

Primary Criteria

- Children on TANF (Temporary Assistance for Needy Families) per 1,000 persons
- Unemployment Rate
- Poverty Rate
- High school diploma or higher

[6-15] Measuring Distress in New Jersey: the 2017 Municipal Revitalization Index Office of Policy and Regulatory Affairs, New Jersey Department of Community Affairs.

- Median Household Income
- Percent of households receiving SNAP (food stamps)

Secondary Criteria

- Ten year rate of change in population
- Non-seasonal housing vacancy rate
- Equalized three year effective property tax rate
- Equalized property valuation per capita

The 2017 state-wide MRI rankings for the combined sewered municipalities within the PVSC service area are shown on Table 6-2. East Newark has a ranking of 65th most distressed municipality out of 565.

Table 6-2 – Municipal Renewal Index for the PVSC Combined Sewered Municipalities

Municipality	2017 Municipal Revitalization Index			Percentile of Least Resourced Municipalities
	MRI Score	MRI Distress Score	MRI Rank	
Bayonne	-4.56	40.2	82	15%
East Newark	**-5.71**	**43.4**	**65**	**12%**
Guttenberg	-5.12	41.8	70	12%
Harrison	-4.49	40.0	87	15%
Jersey City	-5.80	43.7	64	11%
Kearny	-3.67	37.7	106	19%
Newark	-16.53	73.5	12	2%
North Bergen	-4.65	40.5	80	14%
Paterson	-19.43	81.6	8	1%

6.3 Implications of the Additional Economic Factors

The additional economic factors presented above were intended to provide additional context to the affordability and financial capability scores determined in this initial FCA. The context of this FCA and of the implementation of the LTCP is a combined sewered community with effective household incomes well below the federal and state levels, high poverty rates, and high local tax burdens. East Newark is and is likely to remain financially distressed due to structural economic factors beyond its direct control and its ability to afford and finance future CSO control facilities is restricted.

7.0 Potential Impacts of the COVID-19 Pandemic on Affordability

The projections and conclusions concerning the affordability of the CSO control program proposed in this SIAR by East Newark and East Newark's financial capability to finance the CSO control program are premised on the baseline financial conditions of East Newark as well as the economic conditions in New Jersey and the United States generally at the time that work on this SIAR commenced. While the impacts of the pandemic on the long-term affordability of the CSO LTCP are obviously still unknown, it is reasonable to expect that there will be impacts, potentially significant impacts. There are several dimensions to these potential impacts, including both potentially reduced utility revenues, and potentially reduced household incomes.

7.1 Potential Wastewater Utility Revenue Impacts

This Financial Capability Assessment cannot reflect the currently unknowable impacts on wastewater utility revenues stemming from the national economic upheaval resulting from the COVID-19 pandemic. It is however extremely likely that East Newark and municipal wastewater utilities in general across the United States will face significant and potentially permanent declines in revenues from households unable to pay their water and sewer bills and the sudden decline in industrial and commercial demands for potable water and wastewater treatment.

On March 20, 2020 the National Association of Clean Water Agencies (NACWA) issued a press release stating that:

> **"NACWA conservatively estimates the impact to clean water utilities nationwide of lost revenues due to coronavirus at $12.5 Billion.** This is a low-end estimate, assuming an average loss of revenue of 20% which is well within the range of what individual utilities are already projecting. Some utilities are anticipating closer to a 30% or 40% loss in revenue. This estimate is based on the substantial historical utility financial data NACWA has on file through its Financial Survey and recent reports from NACWA members on the decrease in usage they are observing in their systems over the last few weeks."[16]

The impact of a 20% to 40% revenue loss, along with increased costs that have been and will continue to be experienced by water and wastewater utilities such as overtime and the writing off of customer accounts receivable could have a profound impact on the affordability of the proposed CSO controls and East Newark's ability to finance them.

Most of the costs of a municipal wastewater system are relatively fixed within broad operating ranges. Debt service and other capital costs are fixed once incurred. Some operating costs are somewhat variable with wastewater flows, e.g. chemical and electrical power usage but this variability is lessened by the reality that inflow, infiltration and stormwater flow in a combined system are not affected by billed water consumption. Labor costs are not directly variable, e.g. a

16 NACWA press release: Coronavirus Impacting Clean Water Agencies; Local Utilities and Ratepayers Need Assistance March 20, 2020

twenty percent reduction in billed flow would not result in a need for twenty percent less labor. Maintenance costs might go down somewhat as equipment operating times may be reduced.

As costs do not decline proportionately to billed flow, it can be expected that user charge rates must be raised to generate sufficient revenue to sustain current operations. The relationship between changes in costs and revenues and the resultant changes in user charge rates is complex and has not yet been fully analyzed. At this point it can be assumed that user rate increases may be necessary to simply maintain current operations, and these rate increases will likely erode the financial capability of East Newark to fund the CSO LTCP.

7.2 Potential Median Household Income Impacts

The impacts of the pandemic on median household incomes in East Newark cannot be determined at this point. Historical analogies may provide some useful, albeit disturbing, context but are not presented as predictive:

- U.S. median household income fell by 6.2% from $53,000 in 2007 to $49,000 in 2010. In New Jersey, the MHI decreased by around 4.0% for the same period.[17]
- The U.S. unemployment rates rose from 5.0% in December of 2007 to 9.9% in December of 2009.[18]
- Data on impacts of the Great Depression on median household income are not available. As a proxy, the personal income per capita data are available. For 1929 this was $700. By 1933 this figure bottomed out at $376, a decline of 46%. Unemployment for the same period rose from around 3.0% to 25%.[19]

While a quantifiable assessment of the impact of the pandemic on median household income is not feasible at this time, reduction in base year MHI can be expected. This will further exacerbate the impacts of the revenue reductions described above on LTCP affordability, as higher base user charge rates will absorb an increased portion of lower MHI.

7.3 Implications for the Long Term CSO Control Program

East Newark anticipates that the financial implications of the COVID-19 pandemic will be discussed with NJDEP during the review of the SIAR and as the 2021 – 2025 NJPDES permit is developed. Based on the October 1, 2020 revised due date for the SAIR, additional revenue data should be available to support a more specific refinement of this analysis in the SIAR.

Given the current and likely continuing uncertainties as to the New Jersey and national economic conditions, East Newark will be reticent to commit to long term capital expenditures for CSO controls without the incorporation of adaptive management provisions, including provisions to revise and reschedule the long term CSO controls proposed in this SIAR based on emergent economic conditions beyond the East Newark's control. These provisions could include scheduling the implementation of specific CSO control measures to occur during the

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17 Source: Fact Sheet: Income and Poverty Across the States, 2010 Joint Economic Committee, United States Congress, Senator Robert P. Casey, Jr. Chairman.

18 Source: Bureau of Labor Statistics data series LNS1400000

19 Source: Federal Reserve Economic Data (FRED) data series: A792RC0A052NBEA

five year NJPDES permit cycles. A revised affordability assessment should occur be performed during review of the next NJPDES permit to identify controls that are financially feasible during that next permit period.

8.0 Conclusion

The 1997 EPA guidance indicates that ratepayers and municipalities who are highly burdened future expenditures added to their current wastewater treatment, conveyance, and collection costs can be allowed 15 years to complete capital projects to handle CSOs. In extreme cases, the guidance suggested a 20-year compliance schedule might be negotiated.[20]

The affordability analysis detailed above has documented that the selected $6.0 million (current dollars) Municipal Control Alternative along with related operation and maintenance costs would result in a Residential Indicator at the upper end of "medium impact" under EPA's criteria. Moreover, the reality of the low effective household incomes compared to the rest of the US and the high costs of living in East Newark argue strongly that the EPA metric understates the impacts of the CSO control costs on the residents of the City. As evidenced by its New Jersey Municipal Revitalization Index score in the top 88th percentile East Newark's capacity for additional CSO controls beyond those proposed in the SIAR is limited.

[20] Combined Sewer Overflows – Guidance for Financial Capability Assessment and Schedule Development, EPA 832-B-97-004, Page 46.

Appendix

PVSC LTCP Affordability Model

Inputs, Assumptions, and Summary Outputs

East Newark

	Item	Value	Notes / Sources
1	**Finance**		
2	Bond Interest Rate		
3	Market	6.00%	Bond Buyer 20 bond (Revenue Bonds) rolling average interest rate 1986 - 2015
4	NJDEP	0.00%	NJ Environmental Infrastructure Financing Program - Smart Growth program offers 75% funding at 0% interest and 25% funding at market rates for 20 years for CSO control projects.
5	Interest Rate Blend		
6	Market	25%	
7	NJDEP	75%	
8	Blended Interest Rate	1.50%	
9	Bond Term	20	
10	Target Coverage	125.00%	Input
11	O&M as % of Capital Cost	2.0%	General estimate for CSO controls - To be revised with the development of control alternative cost estimates.
12	Capital Fund Balance		Establishes a capital fund from retained earnings in the model.
13	Use Retained Earnings?	no	If "Yes", the Capital Fund is used towards annual capital expditures.
14	Beginning Balance	$0	
15	% Beginning Fund Balance Available for Capital Improvements	50.0%	Determines the percentage of Capital Fund beginning balance that can be used for capital expenditures.
16	**Economic**		
17	Inflation On or Off	ON	
18	Collection System O&M Inflation		
19	NACWA or Local Data	NACWA	NACWA 2011 National Survey
20	3.9%	3.9%	
21	PVSC Service Charge Inflation		
22	NACWA or Local Data	PVSC	PVSC Expenditures 2014 (audit) - 2016 (budget)
23		2.7%	
24	Capital Improvement Inflation	3.7%	Based on the 1984 - 2015 ENR Construction Cost Indices for New York City (80%) and Philadelphia (20%)
27	**Demographic**		
28	Census Households	760	Census - National Community Survey 2013 - 2017
29	Residential Connections	350	Meter Count Summary.PDF (East Newark)
30	Median Household Income		
31	Base Year MHI	$59,313	US Census: American Community Survey - 2013 -2017
32	Base Year	2015	Middle Year of 2013 - 2017 ACS survey period.
33	Income Growth	1.72%	Annualized rate of change for Newark MHI 1990 - 2014 (US Census)
35	**Current Municipal System Costs & Revenues**		
36	Costs		
37	Payments to PVSC	$290,600	2017 Municipal Data Sheet - Sheet 20
38	Collection System Costs		
39	Operations & Maintenance	$40,000	2017 Municipal Data Sheet - Sheet 15a
40	Existing Debt Service Costs	$33,000	2017 Municipal Data Sheet - Sheet 20

Appendix B

	Item	Value	Notes / Sources
41	Other		
42	Total System Costs	$363,600	Existing O&M + Existing Debt Service
43			
44	Last Year Existing Debt	2036	Placeholder
45			
46	2017 Revenues		
47	Rates & Charges	$175,000	2017 Municipal Data Sheet - Sheet 10
48	Other	$188,600	Assumed municipal taxes - difference between rents and costs
49	Total	$363,600	
50	**Current Cost per Residential Connection**		
51	Service Charge (annualized)		
52	Unit Cost	$0.00	
53	Billing Frequency	monthly	
54	Annual Cost	$0.00	
55	Commodity Charge		
56	Unit Cost	(per 100 cubic ft.)	
57	Municipal Collection System	$2.70	
58	PVSC		East Newark Sewer Rates Effective July 1, 2016 ($27/1000ft)
59	Total	$2.70	
60	Typical Household Consumption (gallons)	4,500	
61	Billing Units	ccf	
62	Billing Frequency	monthly	
63	Billing Volume	6.02	Convert gallons (row 65) to hundred cubic feet.
64	Annual Cost	$194.9	
65	Total Annual per Typical Household	$194.9	
	Property Tax Levy for Sewer		Not Used in Current Model Run… Assume rates raised to cover costs.
	Wastewater Costs Net of Rents	$188,600	
	Municipal Purpose Tax	$3,882,078	
	Sewer as % of Total Muni Purpose Tax	5%	
	Average Residential Muni Purpose Tax levy	$10,792	2017 User Friendly Budget Sheet UFB-1
	Estimated Property Tax Towards Sewer	$524	Not used - would be $719 total for user charge + property tax
	Include Estimated P Tax in RI?	Yes	
67	**Future Capital Costs & Scheduling**		
68	CSO Control Costs		
69	Estimated Capital Costs (millions)	$5.5	Input - LTCP capital costs that trigger a 2.0% residential indicator one year after full implementation.
70	Percent Pay-As-You-Go	0%	
71	Cost Estimate Year	2019	Base year for cost estimates.
72	Start Date	2021	Per NJPDES due date for LTCP in 2020
73	Planning Duration (years)	1	Input
74	Design Duration (years)	3	Input
75	Construction Duration (years)	17	Input
76	Total	21	
77	Capital Cost Breakout		

Appendix B

	Item	Value	Notes / Sources
78	Planning	2%	Based on the old USEPA Construction Grants Program regulations (40 CFR 35 appendix A, which used ASCE cost curves.
79	Design	5%	
80	Construction	93%	
81	Total	100%	
82	Other Capital Improvements		
83	Cost per Year	$0	To account for non-LTCP annual capital projects.
84	Target Percent Finance	0%	Allows for annual non-LTCP capital projects to be funded through operating budget or through new debt.
85	Target Percent Cash Funded	100%	
86	Start Year	2017	
87	End Year	NA	Pending municipal data.
88			

Memorandum

To: *Town of Harrison*

Copy: *Thomas Laustsen, Sheldon Lipke, Mike Hope, Tim Dupuis, Scott Craig*

From: *Tom Schevtchuk*

Date: *September 23, 2020*

Subject: *Final Financial Capability Assessment for the Town of Harrison*

1.0 Executive Summary

This Financial Capability Analysis (FCA) memorandum is in support of the Municipal Control Alternative identified in the Selection and Implementation of Alternatives Report (SIAR) developed by the Town of Harrison. It quantifies the projected affordability impacts of Town of Harrison's proposed long term CSO controls for the Harrison combined sewer system (CSS) and updates the 2019 preliminary FCA memo that was intended to guide the development and selection of long term controls.

Table E-1 - Projected Impacts of CSO Controls at a Glance

Typical Household 2019		
Annual Wastewater Costs		
From Sewer Rents		$210
Through Municipal Taxes		$185
	Total	$395
Residential Indicator (RI)*		0.6%
Median Household Income (MHI)		$63,600
LTCP Control Program		
CSO Control Capital Costs ($ millions)		$16.1
First Year After Full Implementation		2041
Projected LTCP Impact on Typical Household Cost		
MHI in 2041		$98,400
Annual Costs Without LTCP		$1,008
Residential Indicator		1.0%
Annual Costs With LTCP		$1,460
Residential Indicator		1.5%

As summarized in Table E-1, this FCA includes the projected impacts if the Municipal Control Alternative is undertaken by Harrison based on the costs and implementation schedule included in Harrison's SIAR Section F.

While a regional alternative would result in lowered overall costs for the control of CSOs within the PVSC service area, the basis of this allocation remains under discussion as of the writing of this memorandum. Under this approach, both the costs of the regional facilities such as a relief interceptor and the resultant savings would be allocated amongst the PVSC municipalities with combined sewer systems. As the basis of this allocation remains under discussion as of the writing of this SIAR, this FCA memorandum focuses on implementation of the Municipal Control Alternative. Should the permittees come to agreement on the cost allocation for the Regional Control Plan, the FCA will be revisited to reassess the affordability and schedule for implementation of the LTCP.

The Financial Capability assessment is a two-step process including ***Affordability*** which evaluates the impact of the CSO control program on the residential ratepayers and ***Financial Capability*** which examines a Town of Harrison's ability to finance the program. Affordability is measured in terms of the Residential Indicator (RI) which is the percentage of median

household income spent on wastewater services. Total wastewater services exceeding 2.0% of the median household income are considered to impose a high burden by USEPA. The financial capability analysis uses metrics similar to the municipal bond rating agencies.

The 2019 preliminary FCA determined that future capital expenditures for CSO controls and all other capital expenditures of approximately $31 million (current dollars) over a twenty-year period (2022 through 2041) would result in a RI exceeding 2.0% using a dynamic (time sensitive) model which accounts for future inflation. Along with the calculated debt service costs associated with the $31 million in capital costs an annual incremental operations and maintenance (O&M) cost of $310,000 1.0% of the capital cost value was estimated.

Harrison's SIAR projects future capital costs for the Municipal Control Alternative totaling $16.1 million through 2040 and incremental annual O&M costs of around $31,400. This would result in a projected residential indicator in 2041, the first year after full implementation of the controls of 1.5% which would constitute a moderate burden under the USEPA analytical guidelines.

The second step of the financial capability analysis documents that Town of Harrison's current financial capability strength is "moderate" These two metrics combine on EPA's Financial Capability Matrix to indicate a medium burden under the USEPA guidance for the $16.1 million in capital expenditures proposed under Harrison's Municipal Control Alternative.

This draft memorandum is based on information provided by Town of Harrison, PVSC and external sources such as the on-line fiscal reports available through the New Jersey Department of Community Affairs.[1]

The projections and conclusions concerning the affordability of the Municipal Control Alternative proposed in this SIAR by the Town of Harrison and Harrison's financial capability to finance the CSO control program are premised on the baseline financial conditions of Harrison as well as the economic conditions in New Jersey and the United States generally at the time that work on this SIAR commenced. While the impacts of the pandemic on the long-term affordability of the CSO LTCP are obviously still unknown, it is reasonable to expect that there will be potentially significant impacts. There are several dimensions to these potential impacts, including reduced utility revenues, household incomes, and property tax collection rate, and increased unemployment.

2.0 Introduction

2.1 Intent of the Financial Capability Analysis

This document presents the final Financial Capability Analysis (FCA) relating to the development of the CSO Long Term Control Plan (LTCP) required under Paragraph G(8)(a) of the Combined Sewer Management section of the Town of Harrison's NJPDES discharge permit. The assessment is based upon the EPA document "Combined Sewer Overflows – Guidance for Financial Capability Assessment and Schedule Development," (EPA Guidance Document)

[1] https://www.nj.gov/dca/divisions/dlgs/resources/fiscal_rpts.shtml

published February 1997[2], as supplemented by EPA's November 2014 memorandum entitled "Financial Capability Assessment Framework for Municipal Clean Water Act Requirements".[3] A preliminary FCA memorandum was provided by PVSC to Harrison and the other combined sewered municipal permittees within its service area in August of 2019, with a subsequent update in December of 2019.

This final FCA and last year's preliminary version support the twofold purposes of the FCA as envisioned in the 1994 CSO Control Policy[4] (Policy). First, the FCA is intended to identify the upper limits of what could constitute an affordable future investment strategy as defined by the Policy and related guidance documents under an assumed LTCP implementation schedule; thereby informing the development of CSO, SSO, MS4, TMDL, and other necessary control alternatives. Second, the financial and user cost (affordability) impacts of the selected CSO controls must be assessed to support the development of a workable implementation schedule for the LTCP.[5]

2.2 EPA's Two Step Analysis Process

The Financial Capability assessment is a two phased process. The residential indicator (RI) is the percentage of median household income (MHI) expended on wastewater (including stormwater) management. The upper limit of affordability for wastewater services within Harrison will be the point where total wastewater management costs for the typical residential user in Town of Harrison exceed 2.0% of the Median Household Income (MHI). This metric of total wastewater management costs as a percentage of MHI is termed the Residential Indicator (RI) by USEPA.

The financial capability indicator is an assessment of the Town of Harrison's debt burden, socioeconomic conditions, and financial operations. These two measures are subsequently entered into a *financial capability matrix*, suggested by EPA, to determine the level of financial burden placed on residential customers and the Town of Harrison by the existing and projected future expenditures to operate, maintain, and enhance the wastewater management system. The EPA matrix appears in Table 5.1 of this document.

The projected future expenditures driving the RI and imposing demands upon the financial capability of Town of Harrison will include the implementation of CSO controls, stormwater controls, conveyance / collection system rehabilitation, in addition to the current debt service and other operational, maintenance, and planned capital improvements to the Town of

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2 EPA 832-B-97-004

3 November 24, 2014 memorandum from Ken Kopocis, Deputy Assistant Administrator, Office of Water (OW) and Cynthia Giles, Assistant Administrator, Office of Enforcement and Compliance (OECA) to Regional Administrators

4 Combined Sewer Overflow Policy Section II-C(8) 59 FR 18694

5 "Schedules for implementation of the long-term CSO control plan may be phased based on the relative importance of adverse impacts upon water quality standards and designated uses, and on a Town of Harrison's financial capability." (59 FR 18688)

Harrison sewer system that have been identified and provided by the Town for inclusion into this analysis.

2.3 Limitations to the EPA Analytical Framework

EPA's 1997 financial capability guidance calls for the use of a simplistic "snap shot" model which assumes that all future expenditures are incurred simultaneously and that costs and incomes should be based on current dollars. This approach has the advantage of eliminating the need to estimate future rates of inflation and income growth. However, this approach can understate the affordability impact of long-term programs since income growth has not kept pace with and is not projected to keep pace with wastewater utility capital and O&M cost inflation. For example, for the period of 1999 through 2013, the national costs for typical household wastewater services increased at a rate of 4.8%.[6] The national Consumer Price Index increased at an annual rate of around 2.4%[7] for the period while the US median household income increased from around $42,000 to $52,250 at an annual rate of 1.6%.[8]

An affordability analysis that does not account for the continuing divergence between wastewater utility costs and income growth over course of a long term implementation schedule will overstate the "affordability" of the LTCP as future costs are recovered from the residential and other system users. Conversely, including current Town of Harrison expenditures or debt service payments which would end before the costs from the CSO controls are paid can understate future affordability.

EPA's November 24, 2014 memorandum encourages the use of a time-based ("dynamic" model per the memo) model to supplement the snapshot approach. PVSC has developed a time-based model that calculates annual costs and revenue requirements based on assumed program costs, schedules and economic variables such as interest and inflation rates. The residential indicator is calculated for each year based upon the costs per typical residential users which changes annually based on the annual system revenue requirements.

An additional limitation to the EPA methodology is its focus on the median household income (MHI) which therefore does not address the affordability impacts of wastewater service costs on the lower income households in Town of Harrison's or any service area. By definition, one half of the households in Town of Harrison would be paying more than 1.0% of their household income for wastewater services when the residential indicator for the MHI equals 1.0%.

Three of the six EPA financial capability metrics focus on general obligation (G.O.) bond rating criteria which are amortized through property tax or other general revenue streams:

- Overall Net Debt as a Percentage of Full Market Property Value;
- Property Tax Revenues as a Percent of Full Market Property Value; and
- Property Tax Revenue Collection Rate.

6 NACWA 2013 Cost of Clean Water Index

7 US Bureau of Labor Statistics

8 US Census

The assumption that G.O. bonds will be used would not be appropriate for financing by municipal authorities.

For this analysis only, it is assumed that financing through the New Jersey Environmental Finance Program will be used as necessary to meet projected construction draw requirements. The actual size and timing of financing necessary to implement the CSO controls will be determined by the eventual construction schedules for the various components of the CSO Controls and other wastewater capital improvement needs and are therefore beyond the scope of this document.

In addition to following guidelines for the affordability and financial capability metrics, EPA encourages inclusion of any information that would have a financial impact on the Town of Harrison in the capability report. This assessment, therefore, includes additional discussion of socioeconomic trends in Town of Harrison because of the financial challenges that the municipality faces.

3.0 Affordability Assessment

3.1 Baseline (2019) Wastewater Services Affordability

The Residential Indicator is an approximation of households' abilities to pay their total wastewater costs and is derived by dividing the total annual wastewater costs for the typical household within Harrison by the median household income within the service area. The Residential Indicator is compared to EPA-defined criteria to determine whether total annual wastewater costs impose a low, mid-range, or high impact on residential users. Table 3-1 shows U.S. EPA's Residential Indicator criteria, which define a "low" impact as a cost per household (CPH) less than 1.0% median household income (MHI), a "mid-range" impact between 1.0 and 2.0%, and "high" impact as greater than 2.0% of MHI.

Table 3-1. EPA Residential Indicator

Residential Indicator	Cost per Household
Low Burden	Less than 1.0 percent of MHI
Mid-Range Burden	1.0-2.0 percent of MHI
High Burden	Greater than 2.0 percent of MHI

The estimated annual cost for wastewater services for a typical single-family residential user for 2019 is $395, including $185 through municipal taxes and $210 from sewer rents. This estimate is based on typical residential potable water usage is 4,100 gallons monthly. Based on the estimated MHI of $63,600 the Residential Indicator is approximately 0.6%, or what the EPA guidance defines as a low burden. By definition, the current residential indicator for one half of the households is greater than the 0.6%.

In Harrison, 16.2% of the population was living below the poverty line. The total Census households are broken out by income brackets on Table 3-2 below, along with the respective current Residential Indicators by income bracket. The RI for each bracket was calculated from

the mid-point income within the bracket. As may be noted, the calculated 2019 RI for around 950 households was at or greater than 2.0%.

Table 3-2. Analysis of the Current Residential Indicator

Income Bracket	Households		Bracket Average Income	Bracket RI at Typical Cost per Household
	Number	Cumulative		
Less than $10,000	330	330	$5,000	7.9%
$10,000 to $14,999	186	516	$12,500	3.2%
$15,000 to $24,999	434	950	$20,000	2.0%
$25,000 to $34,999	493	1,443	$30,000	1.3%
$35,000 to $49,999	820	2,263	$42,500	0.9%
$50,000 to $74,999	1,238	3,501	$62,500	0.6%
$75,000 to $99,999	621	4,122	$87,500	0.5%
$100,000 to $149,999	822	4,944	$125,000	0.3%
$150,000 to $199,999	381	5,325	$175,000	0.2%
$200,000 or more	297	5,622	$200,000	0.2%
Total	5,622	*Costs per household include sewer rents and municipal taxes supporting wastewater services		

3.2 Affordability Impacts of the Selected CSO Control Alternatives

The Town of Harrison has identified a long term CSO control strategy that will achieve 85% capture of wet weather flows during the typical year. These controls are summarized on Table 3-3.

Table 3-3 – Town of Harrison's Selected CSO Controls

Wet Weather Control Types	Capital Costs	Incremental Annual O&M Costs
Green Infrastructure Program (future)	$750,000	$31,400
Sewer Separation (if not completed through redevelopment	$15,300,000	
Total	$16,100,000	

Implementation of the $16.1 million Municipal Control Alternative results in projected annual costs per typical single family user of $832 (without inflation) and a residential indicator of 1.2% in 2041, the first year after the projected full implementation of the controls ending in 2040. Accounting for inflation, annual costs would grow to $1,620 with a residential indicator of 1.5% in 2041.as shown in Table 3-4.

Table 3-4 – Town of Harrison Projected Residential Indicator Upon Full Implementation of the Municipal Control Alternative

Metric	Baseline (2019)	Cost per Typical Residential Wastewater User in 2041			
		No LTCP		LTCP Implementation Completed in 2040	
		With Inflation	Without Inflation	With Inflation	Without Inflation
RI	0.6%	1.0%	0.8%	1.2%	1.5%
Annual $	$395	$1,008	$509	$754	$1,460

Key points from Table 3-4 are:

- The base year (2019) cost per typical single family wastewater user in Harrison was calculated to be $395 based on a monthly water consumption of 4,100 gallons. Based on a 2019 median household income of $63,600 this works out to a RI of 0.6%.
- The costs per typical single family user in Harrison is projected to increase to $1,008 annually without implementing the CSO controls due to inflation. This would represent a RI of 1.0%.
- Implementing a $16.1 million Municipal Control Alternative completed in 2040 years would result in annual costs per typical single family user of $1,460 in 2041 which works out to a 1.5% RI.
- Excluding inflation, the projected cost per typical single family user with the CSO controls would be around $754 in 2041, a RI of 1.2%
- The analysis does not reflect the current and lingering financial impacts as a result of the COVID -19 pandemic and should be revisited upon finalizing the LTCP implementation schedule.

3.3 Underlying Assumptions

Key assumptions used in the above analysis are summarized on Table 3-5. An annotated complete list of all data and assumptions used in the affordability model is provided as an appendix to this memorandum.

Table 3-5 – Affordability Model Key Inputs and Assumptions

Item	Value	Notes
Finance		
Bond Term		
Market Interest Rate	6.0%	NJEIT Financing – Smart Growth program offers 75% funding at 0% interest and 25% funding at market rates for 20 years for CSO control projects.
NJDEP	0.0%	
Blended Interest Rate	1.5%	
Target Coverage	125.00%	

Table 3-5 – Affordability Model Key Inputs and Assumptions

Item	Value	Notes
O&M as % of Capital Cost	1.0%	
Economic		
LTCP O&M Inflation	4.0%	Based on national rates of wastewater system O&M costs in 2017 NACWA study.
LTCP Construction Inflation	3.7%	Based on 1984 – 2015 ENR Construction Cost Index for New York City (80%) and Philadelphia (20%).
Estimate Base Year		
MHI Data Year	2015	
Typical Household Monthly Consumption	4,100	Typical urban water consumption.
Demographic		
Residential Share of Billed Water Consumption		Municipal account data.

4.0 Analysis of Financial Capability Indictors

The second part of the financial capability assessment - calculation of the financial capability indicator for the Town of Harrison - includes six items that fall into three general categories of debt, socioeconomic, and financial management indicators. The six items are:

- Bond rating
- Total net debt as a percentage of full market real estate value
- Unemployment rate
- Median household income
- Property tax revenues as a percentage of full market property value
- Property tax revenue collection rate

Each item is given a score of three, two, or one, corresponding to ratings of strong, mid-range, or weak, according to EPA-suggested standards. The overall financial capability indicator is then derived by taking a simple average of the ratings. This value is then entered into the financial capability matrix to be compared with the residential indicator for an overall capability assessment). Table 4-1 contains the six criteria and the ratings that categorize the Town of Harrison as strong, mid-range, or weak in each category. A discussion of each item follows.

Table 4-1 Town of Harrison Financial Capability Indicator Benchmarks

Indicator	Strong (3)	Mid-Range (2)	Weak (1)
Bond Rating	AAA-A (S&P) or Aaa-A (Moody's)	BBB (S&P) or Baa (Moody's)	BB-D (S&P) of Ba-C (Moody's)
Overall Net Debt as a Percent of Full Market Property Value	Below 2%	2% to 5%	Above 5%

Indicator	Strong (3)	Mid-Range (2)	Weak (1)
Unemployment Rate	More than 1% below the National Average	+/- 1% of the National Average	More than 1% above the National Average
Median Household Income	More than 25% above National MHI	+/- 25% above National MHI	More than 25% below National MHI
Property Tax as a Percent of Full Market Property Value	Below 2%	2% to 4%	Above 4%
Property Tax Collection Rate	Above 98%	94% to 98%	Below 94%

4.0 Financial Capability Indictors

The second part of the financial capability assessment - calculation of the financial capability indicator for the permittee - includes six items that fall into three general categories of debt, socioeconomic, and financial management indicators. The six items are:

- Bond rating
- Total net debt as a percentage of full market real estate value
- Unemployment rate
- Median household income
- Property tax revenues as a percentage of full market property value
- Property tax revenue collection rate

Each item is given a score of three, two, or one, corresponding to ratings of strong, mid-range, or weak, according to EPA-suggested standards. The overall financial capability indicator is then derived by taking a simple average of the ratings. This value is then entered into the financial capability matrix to be compared with the residential indicator for an overall capability assessment). Table 4-1 contains the six criteria and the ratings that categorize the permittee as strong, mid-range, or weak in each category. A discussion of each item follows.

Table 4-1 Permittee Financial Capability Indicator Benchmarks

Indicator	Strong (3)	Mid-Range (2)	Weak (1)
Bond Rating	AAA-A (S&P) or Aaa-A (Moody's)	BBB (S&P) or Baa (Moody's)	BB-D (S&P) of Ba-C (Moody's)
Overall Net Debt as a Percent of Full Market Property Value	Below 2%	2% to 5%	Above 5%
Unemployment Rate	More than 1% below the National Average	+/- 1% of the National Average	More than 1% above the National Average

Indicator	Strong (3)	Mid-Range (2)	Weak (1)
Median Household Income	More than 25% above National MHI	+/- 25% above National MHI	More than 25% below National MHI
Property Tax as a Percent of Full Market Property Value	Below 2%	2% to 4%	Above 4%
Property Tax Collection Rate	Above 98%	94% to 98%	Below 94%

4.1 Bond Rating – Indicator 1

Harrison's bond rating is Baa1 by Moody's Investor Services as of 2016.

4.2 Overall Net Debt as a Percent of Full Market Value – Indicator 2

Debt Burden is measured by overall net debt as a percent of full market property value, which evaluates the ability of local government to issue additional debt. Overall Net Debt is defined as current total liability to be repaid by property taxes divided by the municipality's full market property value. This indicator is relevant as a metric for municipalities issuing general obligation bonds which are substantially repaid through property tax revenues.

Overall net debt includes overlapping debt, which is the indebtedness of Harrison and the local school district. The Harrison Direct Net Debt for 2017 totaled $29.8 million.[9] The percent of total net debt to the three-year average property valuation of $1.22 billion[10] was 2.45% places Harrison in the midrange range on this measure.

4.3 Unemployment Rate – Indicator 3

The unemployment rate is used as an assessment of the economic well-being of residential users in the service area. The dataset for the municipal unemployment rates is taken from the US Census American Community Survey 2013-2017 estimates. The American Community Survey gathers data over a 5-year period.[11]

The prevailing unemployment rate provided by the ACS for that timeframe more closely represents the actual strength of the economy in a municipality. The unemployment rate for Harrison at 8.6% compared to the national rate of 6.6% for the same time period. It may be noted that the "weak" rating is triggered in the EPA table when the local unemployment rate is one percent above the national average. It should also be noted that the above statistics are for Harrison and should not be confused with Bureau of Labor Statistics data for the New York – Newark SMSA.

4.4 Median Household Income – Indicator 4

Median Household Income (MHI) divides the relevant incomes of a population into two parts so that half of the incomes are below the median and half of the incomes are above the median. Unlike average income, median income is not skewed by extremely high or extremely low

[9] Source: 2017 NJDCA User Friendly Budget Sheet USB-10

incomes in the dataset. Table 4-2 shows that the MHI within the Harrison is slightly higher than the national average, resulting in a midrange rating per the EPA metric.

Table 4-2 Median Household Income

	Median Household Income[10]
Harrison	$61,200
United States	$57,650
% Difference	+6%
Categorization	Midrange

4.5 Property Tax Revenues as a % of Full Market Value – Indicator 5

The three year average property valuation in Harrison was $1.22 billion.[11] A tax of $34.3 million is levied on the assessed valuation. Therefore, the property tax levy is approximately 2.9%. This value is considered midrange in the USEPA metrics.

4.6 Property Tax Collection Rate

The EPA criterion for a strong rating in this category is a collection rate of more than 98%. Harrison's rate is estimated to be 98.5%, which places it in the strong range for real estate tax collections.

4.7 Financial Indicator Score

As shown on Table 4-3, the overall score for the financial indicators is 2.0, yielding an EPA Qualitative Score of midrange. This calculation is based on the use of all six of the indicators that are applicable to Harrison.

Table 4-3 – Permittee Financial Capability Indicator Benchmarks

Indicator	Rating	Numeric Score
Bond Rating	Midrange	2
Overall Net Debt as a Percent of Full Market Property Value	Midrange	2
Unemployment Rate	Weak	1
Median Household Income	Midrange	2
Property Tax as a Percent of Full Market Property Value	Midrange	2
Property Tax Collection Rate	Strong	3
	Total	12
Overall Indicator Score: (numeric score / number of applicable indicators)		2.0
	EPA Qualitative Score	Midrange

[10] Source: US Census – National Community Survey estimates for 2013 - 2017
[11] Source: 2017 User Friendly Budget – sheet USB 10

5.0 Financial Capability Matrix

In this section the results of the step 1 affordability analysis which goes towards the residential ratepayers' ability to afford CSO controls within the context of other capital investment needs is integrated with the step 2 (Financial Capability) analysis which goes towards the permittee's ability to finance the implementation of the LTCP.

It was established previously that $16 million capital expenditures for the Harrison Municipal Control Alternative through 2040 would result in a Residential Indicator of 1.6% of median household income, within the EPA definition of a medium burden.

The overall Harrison financial capability rating considered to be midrange under the EPA framework. The intersection of these two ratings on the EPA financial capability matrix places the Harrison sewer system in the category of high financial burden, as shown on Table 5-1.

Table 5.1 The Financial Capability Matrix - (Shaded areas Indicate Harrison's Ratings)

Permittee Financial Capability Indicators Score	Residential Indicator		
(Socioeconomic, Debt and Financial Indicators)	Low (Below 1.0%)	Mid-Range (Between 1.0 and 2.0%)	High (Above 2.0%)
Weak (Below 1.5)	Medium Burden	High Burden	High Burden
Mid-Range (Between 1.5 and 2.5)	Low Burden	**Medium Burden**	High Burden
Strong (Above 2.5)	Low Burden	Low Burden	Medium Burden

6.0 Additional Economic Factors

In addition to following EPA guidelines for completion of the financial capability assessment matrix, a discussion of socioeconomic trends in the Town of Harrison sewer system area is essential to the consideration of scheduling and compliance levels with CSO guidelines.

6.1 Cost of Living Factors

6.1.1 Cost of Living Index

Specific cost of living comparisons of Harrison and national averages are not available. However, the cost of living for the Cities of Elizabeth and Newark is approximately 30% higher than the national average.[12] Using this value as a proxy, households in Harrison face costs of living that are about 30% higher than the national average while earning an income that is

[12] http://www.infloplease.com/business/economy/cost of living - index.us-cities html

about 6% higher than the national median income. Put another way, adjusting for the cost of living, the effective MHI in Harrison is about 81% of the national MHI.

6.1.2 Housing Costs

One of the major drivers in the higher cost of living in Harrison is the cost of housing. Housing costs in Harrison are approximately 169%[13] of the national average. The Residential Indicator is a national screening parameter and does not account for localized factors which erode the effective household income. Based upon a 2017 study[14] by the National Low Income Housing Coalition, the fair market value of a two bedroom apartment in Hudson County was $1,519 per month which works out to 30% of the Harrison median household income.

6.1.3 Local Tax Burdens

The property tax burdens within the combined sewered municipalities of the PVSC service area are substantial. The average residential tax for 2017 in Harrison was $10,954. This includes Harrison taxes of $5,706 along with Hudson County and school district taxes.[15] This compares with a national average local property tax levy of $3,500 for a similarly priced home. Moreover, as housing prices are higher in the New York – Newark metropolitan area than nationally, houses costing well over the national median value of $193,500 are purchased by families of modest incomes.

The high housing costs and tax burdens facing Harrison households reduces their effective household income. Consequently, measuring the household burden imposed by wastewater costs as a percentage of the median household income may underestimate the financial burden of the projected wastewater costs per household. As was noted in an analysis of the impacts of CSO controls in the Boston region:

> *"The greater are the costs of other necessities as a share of MHI, the greater will be the economic burden associated with sewer charges equal to a given percent of MHI."* [16]

6.2 Poverty Factors

6.2.1 Poverty Rate[17]

In 2017 16.2% of the population in Harrison was living below the poverty line. This compares to the national average poverty rate of 14.6%.

6.2.2 Household Income Brackets

When the Residential Indicator is 1.6% of median household income, by definition half of the households in Harrison would be paying more than 1.6% of their household incomes for

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13 Using the Newark – Elizabeth cost of living indices.

14 Out of Reach 2017 – The High Cost of Housing National Low Income Housing Coalition.

15 Source: 2017 NJDCA User Friendly Budget sheet UFB-1

16 Assessment of the Economic Impact of Additional Combined Sewer Overflow Controls in the Massachusetts Water Resource Authority Service Area (page 13) prepared by Robert N. Stavins, Genia Long, and Judson Jaffee. Analysis Group Incorporated, August 2004.

17 Source: US Census – National Community Survey 2013 - 2017

wastewater services. The impacts of a 1.5% municipality wide RI can be severe on low income households. As shown on Table 6-1 around 1,440 households would be paying 3.1% or more of their household incomes for wastewater services.

Table 6-1 – Impact of the Municipal Control Alternative on the Residential Indicator

Income Bracket	Households		Estimated Population		RI @ Resulting from $16.1 Million in Capital Expenditures through 2040	Bracket Average Income
	Number	Cumulative	Number	Cumulative		
Less than $10,000	330	330	933	933	18.9%	$5,000
$10,000 to $14,999	186	516	526	1,459	7.6%	$12,500
$15,000 to $24,999	434	950	1,227	2,686	4.7%	$20,000
$25,000 to $34,999	493	1,443	1,394	4,081	3.1%	$30,000
$35,000 to $49,999	820	2,263	2,319	6,399	2.2%	$42,500
$50,000 to $74,999	1,238	3,501	3,501	9,900	1.5%	$62,500
$75,000 to $99,999	621	4,122	1,756	11,656	1.1%	$87,500
$100,000 to $149,999	822	4,944	2,324	13,981	0.8%	$125,000
$150,000 to $199,999	381	5,325	1,077	15,058	0.5%	$175,000
$200,000 or more	297	5,622	840	15,898	0.5%	$200,000
Total	5,622		15,898			

6.2.2 Income Growth Trends

In Harrison MHI growth was about 2.0% average annually 2000 to 2017. This is comparable to the 1.9% growth rates for New Jersey and the U.S. for the same period.

6.2.3 New Jersey Department of Community Affairs Municipal Revitalization Index

New Jersey's Municipal Renewal Index[6-18] measures the social, economic, physical and financial conditions of the 565 municipalities within New Jersey. The MRI is compiled by the NJ Department of Community Affairs and is used in the distribution of needs based funding. Six primary along with four secondary criteria are used:

Primary Criteria

- Children on TANF (Temporary Assistance for Needy Families) per 1,000 persons
- Unemployment Rate
- Poverty Rate
- High school diploma or higher

[6-18] Measuring Distress in New Jersey: the 2017 Municipal Revitalization Index Office of Policy and Regulatory Affairs, New Jersey Department of Community Affairs.

- Median Household Income
- Percent of households receiving SNAP (food stamps)

Secondary Criteria

- Ten year rate of change in population
- Non-seasonal housing vacancy rate
- Equalized three year effective property tax rate
- Equalized property valuation per capita

The 2017 state-wide MRI rankings for the combined sewered municipalities within the PVSC service area are shown on Table 6-2. The Town of Harrison has a ranking of 87th most distressed municipality out of 565 which puts it in the top (least resourced) 15% of all New Jersey municipalities.

Table 6-2 – Municipal Renewal Index for the PVSC Combined Sewered Municipalities

Municipality	2017 Municipal Revitalization Index			Percentile of Least Resourced Municipalities
	MRI Score	MRI Distress Score	MRI Rank	
Bayonne	-4.56	40.2	82	15%
East Newark	-5.71	43.4	65	12%
Guttenberg	-5.12	41.8	70	12%
Harrison	**-4.49**	**40.0**	**87**	**15%**
Jersey City	-5.80	43.7	64	11%
Kearny	-3.67	37.7	106	19%
Newark	-16.53	73.5	12	2%
North Bergen	-4.65	40.5	80	14%
Paterson	-19.43	81.6	8	1%

6.3 Implications of the Additional Economic Factors

The additional economic factors presented above were intended to provide additional context to the affordability and financial capability scores determined in this initial FCA. The context of this FCA and of the implementation of the LTCP is a combined sewered community with household incomes well below the federal and state levels, high poverty rates, and high local tax burdens. Town of Harrison is and is likely to remain financially distressed due to structural economic factors beyond its direct control and its ability to afford and finance future CSO control facilities is restricted.

7.0 Potential Impacts of the COVID-19 Pandemic on Affordability

The projections and conclusions concerning the affordability of the CSO control program proposed in this SIAR by the Town of Harrison and Harrison's financial capability to finance the CSO control program are premised on the baseline financial conditions of Town of Harrison as well as the economic conditions in New Jersey and the United States generally at the time that work on this SIAR commenced. While the impacts of the pandemic on the long-term affordability of the CSO LTCP are obviously still unknown, it is reasonable to expect that there will be impacts, potentially significant impacts. There are several dimensions to these potential impacts, including both potentially reduced utility revenues, and potentially reduced household incomes.

7.1 Potential Wastewater Utility Revenue Impacts

This Financial Capability Assessment cannot reflect the currently unknowable impacts on wastewater utility revenues stemming from the national economic upheaval resulting from the COVID-19 pandemic. It is however extremely likely that Town of Harrison and municipal wastewater utilities in general across the United States will face significant and potentially permanent declines in revenues from households unable to pay their water and sewer bills and the sudden decline in industrial and commercial demands for potable water and wastewater treatment.

On March 20, 2020 the National Association of Clean Water Agencies (NACWA) issued a press release stating that:

> **"NACWA conservatively estimates the impact to clean water utilities nationwide of lost revenues due to coronavirus at $12.5 Billion.** This is a low-end estimate, assuming an average loss of revenue of 20% which is well within the range of what individual utilities are already projecting. Some utilities are anticipating closer to a 30% or 40% loss in revenue. This estimate is based on the substantial historical utility financial data NACWA has on file through its Financial Survey and recent reports from NACWA members on the decrease in usage they are observing in their systems over the last few weeks."[19]

The impact of a 20% to 40% revenue loss, along with increased costs that have been and will continue to be experienced by water and wastewater utilities such as overtime and the writing off of customer accounts receivable could have a profound impact on the affordability of the proposed CSO controls and Town of Harrison's ability to finance them.

Most of the costs of a municipal wastewater system are relatively fixed within broad operating ranges. Debt service and other capital costs are fixed once incurred. Some operating costs are somewhat variable with wastewater flows, e.g. chemical and electrical power usage but this variability is lessened by the reality that inflow, infiltration and stormwater flow in a combined system are not affected by billed water consumption. Labor costs are not directly variable, e.g. a

[19] NACWA press release: Coronavirus Impacting Clean Water Agencies; Local Utilities and Ratepayers Need Assistance March 20, 2020

twenty percent reduction in billed flow would not result in a need for twenty percent less labor. Maintenance costs might go down minimally as equipment operating times may be reduced.

As costs do not decline proportionately to billed flow, it can be expected that user charge rates must be raised to generate sufficient revenue to sustain current operations. The relationship between changes in costs and revenues and the resultant changes in user charge rates is complex and has not yet been fully analyzed. At this point it can be assumed that user rate increases may be necessary to simply maintain current operations, and these rate increases will likely erode the financial capability of Town of Harrison to fund the CSO LTCP.

7.2 Potential Median Household Income Impacts

The impacts of the pandemic on median household incomes in Town of Harrison cannot be determined at this point. Historical analogies may provide some useful, albeit disturbing, context but are not presented as predictive:

- U.S. median household income fell by 6.2% from $53,000 in 2007 to $49,000 in 2010. In New Jersey, the MHI decreased by around 4.0% for the same period.[20]
- The U.S. unemployment rates rose from 5.0% in December of 2007 to 9.9% in December of 2009.[21]
- Data on impacts of the Great Depression on median household income are not available. As a proxy, the personal income per capita data are available. For 1929 this was $700. By 1933 this figure bottomed out at $376, a decline of 46%. Unemployment for the same period rose from around 3.0% to 25%.[22]

While a quantifiable assessment of the impact of the pandemic on median household income is not feasible at this time, reduction in base year MHI can be expected. This will further exacerbate the impacts of the revenue reductions described above on LTCP affordability, as higher base user charge rates will absorb an increased portion of lower MHI.

7.3 Implications for the Long Term CSO Control Program

Town of Harrison anticipates that the financial implications of the COVID-19 pandemic will be discussed with NJDEP during the review of the SIAR and as the 2021 – 2025 NJPDES permit is developed. Based on the October 1, 2020 revised due date for the SAIR, additional revenue data should be available to support a more specific refinement of this analysis in the SIAR.

Given the current and likely continuing uncertainties as to the New Jersey and national economic conditions, Town of Harrison will be reticent to commit to long term capital expenditures for CSO controls without the incorporation of adaptive management provisions, including provisions to revise and reschedule the long term CSO controls proposed in this SIAR based on emergent economic conditions beyond the Town of Harrisons' control. As detailed in Section F of Town of Harrison's SIAR these provisions could include scheduling the

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20 Source: Fact Sheet: Income and Poverty Across the States, 2010 Joint Economic Committee, United States Congress, Senator Robert P. Casey, Jr. Chairman.

21 Source: Bureau of Labor Statistics data series LNS1400000

22 Source: Federal Reserve Economic Data (FRED) data series: A792RC0A052NBEA

implementation of specific CSO control measures to occur during the five year NJPDES permit cycles. A revised affordability assessment should occur be performed during review of the next NJPDES permit to identify controls that are financially feasible during that next permit period.

8.0 Conclusion

While the affordability analysis detailed above has documented that the selected $16 million (current dollars) Municipal Control Alternative along with related operation and maintenance costs would result in a Residential Indicator of "medium impact" under EPA's criteria; the reality of the higher than national average poverty rates, low household incomes compared to the rest of New Jersey and nationally and the high costs of living in Town of Harrison argue strongly that the EPA metric understates the impacts of the CSO control costs on the residents of the Town. As evidenced by its New Jersey Municipal Revitalization Index score in the top 85th percentile Town of Harrison's capacity for additional CSO controls beyond those proposed in the SIAR is limited.

Appendix

PVSC LTCP Affordability Model

Inputs, Assumptions, and Summary Outputs

Town of Harrison

	Item	Value	Notes / Sources
1	**Finance**		
2	Bond Interest Rate		
3	Market	6.00%	Bond Buyer 20 bond (Revenue Bonds) rolling average interest rate 1986 - 2015
4	NJDEP	0.00%	NJ Environmental Infrastructure Financing Program - Smart Growth program offers 75% funding at 0% interest and 25% funding at market rates for 20 years for CSO control projects.
5	Interest Rate Blend		
6	Market	25%	
7	NJDEP	75%	
8	Blended Interest Rate	1.50%	
9	Bond Term	20	
10	Target Coverage	125.00%	Input
11	O&M as % of Capital Cost	2.0%	General estimate for CSO controls - To be revised with the development of control alternative cost estimates.
12	Capital Fund Balance		Establishes a capital fund from retained earnings in the model.
13	Use Retained Earnings?	Yes	If "Yes", the Capital Fund is used towards annual capital expditures.
14	Beginning Balance	$0	
15	% Beginning Fund Balance Available for Capital Improvements	50.0%	Determines the percentage of Capital Fund beginning balance that can be used for capital expenditures.
16	**Economic**		
17	Inflation On or Off	**on**	
18	Collection System O&M Inflation		
19	NACWA or Local Data	NACWA	NACWA 2017 National Survey
20		3.9%	
21	PVSC Service Charge Inflation	3.9%	
22	NACWA or Local Data	PVSC	PVSC Expenditures 2014 (audit) - 2016 (budget)
23		2.7%	
24	Capital Improvement Inflation	3.7%	Based on the 1984 - 2015 ENR Construction Cost Indices for New York City (80%) and Philadelphia (20%)
25	Estimate Base Year	2016	
26			
27	**Demographic**		
28	Census Households	4,869	Census (American Fact Finder)
29	Residential Connections	4,500	Estimate based on ratio of residential customers and Census households in Philadelphia. Subject to replacement if actual number is available.
30	Median Household Income		
31	Base Year MHI	$61,168	2013 - 2017 National Community Survey Five Year Estimate - 2015 dollars
32	Base Year	2017	
33	Income Growth	2.000%	Annualized rate of change for Harrison MHI 2000- 2017 (US Census)
34			

	Item	Value	Notes / Sources
35	**Current Municipal System Costs & Revenues**		
36	Annual Costs		Cost analysis of 2019 provided by Gabriela Simoes, CFO of Harrison.
37	Sewer Utility O&M and Minor Capital		
38	Social Security	$10,000	
39	(S&W)	$107,500	
40	Other Expenses	$132,850	
41	Capital Improvement Fund	$25,000	
42	Capital Outlay	$2,230	
43	Subtotal	277,580	
44	PVSC Service Charge	$900,000	
45	Municipal Costs Apportioned to Sewer Services		
46	Worker's Comp Insurance	$56,352	
47	General Liability Insurance	$49,218	
48	Unemployment	$11,000	
49	(S&W)	$21,270	
50	(S&W)	$15,670	
51	(S&W)	$53,700	
52	(S&W)	$24,861	
53	Public Works Vehicle Maint	$12,165	
54	Gas/Electric Street Dept / Essex	$3,645	
55	Town Diesel & Gasoline	$23,205	
56	Subtotal	$271,085	
57	Other Sewer System Costs		
58	Sewer Cleaning - 50% of Town per year	$9,400	
59	Sewer Repair	$6,000	
60	Sewer Repair - Material (Black Top/Cement)	$1,000	
61	CSO Monthly Inspection	$7,200	
62	CSO Bag Changes	$2,000	
63	Street Sweeping	$19,600	
64	Catch Basin Rebuilds	$10,800	
65	Fringe Benefits (Health & PERS)	$94,520	
66	CSO Net Disposal Costs	$36,360	
67	Subtotal	$186,880	
68	Capital Expenditures		
69	Jet Vac Truck - 5 Year Useful Life	$78,000	
70	Street Sweeper - 5 Year Useful Life	$14,000	
71	Pick Up Trucks - 2 Year Useful Life	$25,000	
72	Mott MacDonald CSO Contract	$0	
73	Subtotal	$117,000	
74	Total O&M	$1,752,546	
75			
76	Debt Service		
77	Bond Principal	$125,000	
78	Bond Interest	$16,363	
79	NJEIT	$30,058	
80	Total Debt Service	$171,420	
81	Grand Total Annual Cost	$1,923,966	

	Item	Value	Notes / Sources
82			
83	Last Year Existing Debt	2029	
84			
85	2019 Revenues		
86	Sewer Rents	$1,349,000	
87	Other Non-Tax Revenues	$21,398	
88	Tax Revenues	$574,966	
89	Total	$1,923,966	
90			
91	**Current Cost per Residential Connection**		
92	From Sewer Rents		
93	Unit Cost	(per 100 cubic ft.)	
94	Municipal Collection System	$3.20	
95	PVSC		Harrison Code of Ordinances 13.04.150: $32/1,000 cubic foot
96	Total	$3.20	
97	Typical Household Consumption (gallons)	4,100	Typical urban water consumption
98	Billing Units	ccf	
99	Billing Frequency	monthly	
100	Billing Volume	5.48	Convert gallons (row 65) to hundred cubic feet.
101	Annual Cost	$210	
102	Total Annual per Typical Household		
103	From Property Taxes		
104	Average Residential Assessment	$153,649	
105	2019 Municipal Purpose Tax Rate	3.5320	
106	Municipal Purpose Tax	$5,427	
107	2019 Municipal Purpose Tax Levy	$16,871,968	
108	Sewer Related Muni Tax Levy	$574,966	
109	Sewer Related as % of Muni Levy	3.41%	
110	Tax Supported Sewer Related	$185	
111	Total Annual per Typical Residential Connection	$395	
112			
113	**Future Capital Costs & Scheduling**		
114	CSO Control Costs		
115	Estimated Capital Costs (millions)	$31.7	Input - LTCP capital costs that trigger a 2.0% residential indicator one year after full implementation.
116	Percent Pay-As-You-Go	0%	
117	Cost Estimate Year	2019	Base year for cost estimates.
118	Start Date	2021	Per NJPDES due date for LTCP in 2020
119	Planning Duration (years)	1	Input
120	Design Duration (years)	3	Input
121	Construction Duration (years)	17	Input
122	Total	21	
123	Capital Cost Breakout		
124	Planning	2%	Based on the old USEPA Construction Grants Program regulations (40 CFR 35 appendix A), which used ASCE cost curves.
125	Design	5%	
126	Construction	93%	
127	Total	100%	

	Item	Value	Notes / Sources
128	Other Capital Improvements		
129	Cost per Year	$500,000	Planning number based on discussions with Harrison
130	Target Percent Finance	0%	Allows for annual non-LTCP capital projects to be funded through operating budget or through new debt.
131	Target Percent Cash Funded	100%	
132	Start Year	2020	
133	End Year	2050	
134			

Memorandum

To: *Jersey City MUA*

Copy: *Thomas Laustsen, Sheldon Lipke*

From: *Tom Schevtchuk*

Date: *September 23, 2020*

Subject: *Final Financial Capability Assessment for Jersey City*

1.0 Executive Summary

Projected Impacts of CSO Control at a Glance	
Typical Household 2019	
Annual Wastewater Costs	$482
Residential Indicator	0.7%
Median Household Income	$65,300
LTCP Control Options	
Capital Costs in million current $	$657.7
First Year After Full Implementation	2051
LTCP Impact on Typical Household Cost in	2051
Projected Median Household Income	$123,300
Projected Annual Costs	
Without LTCP	$1,082
With LTCP	$1,652
Residential Indicator	
Without LTCP	0.9%
With LTCP	1.30%

This Financial Capability Analysis (FCA) memorandum is in support of the Municipal Control Alternative identified in the Selection and Implementation of Alternatives (SIAR) developed by the JCMUA. It quantifies the projected affordability impacts of JCMUA's proposed long term CSO controls for the Jersey City combined sewer system (CSS) and updates the 2019 preliminary FCA memo that was intended to guide the development and selection of long term controls.

As summarized in Table E-1, this FCA includes the projected impacts if the CSO controls are undertaken by JCMUA alone (Municipal Control Alternative) based on the costs and implementation schedule included in JCMUA's SIAR Section F.

While a regional alternative would result in lowered overall costs for the control of CSOs within the PVSC service area, the basis of this allocation remains under discussion as of the writing of this memorandum. Under this approach, both the costs of the regional facilities such as a relief interceptor and the resultant savings would be allocated amongst the PVSC municipalities with combined sewer systems. As the basis of this allocation remains under discussion as of the writing of this SIAR, this FCA memorandum focuses on implementation of the Municipal Control Alternative. Should the permittees come to agreement on the cost allocation for the Regional Control Plan, the FCA will be revisited to reassess the affordability and schedule for implementation of the LTCP.

The Financial Capability assessment is a two-step process including ***Affordability*** which evaluates the impact of the CSO control program on the residential ratepayers and ***Financial Capability*** which examines a permittee's ability to finance the program. Affordability is measured in terms of the Residential Indicator (RI) which is the percentage of median

household income spent on wastewater services. Total wastewater services exceeding 2.0% of the median household income are considered to impose a high burden by USEPA. The financial capability analysis uses metrics similar to the municipal bond rating agencies.

The 2019 preliminary FCA determined that future capital expenditures for CSO controls and all other capital expenditures of approximately $1.1 billion (current dollars) over a twenty-year period (2022 through 2041) would result in a RI exceeding 2.0% using a dynamic (time sensitive) model which accounts for future inflation. Along with the calculated debt service costs associated with the $1.1 billion in capital costs an annual incremental operations and maintenance (O&M) cost of $22.2 million or 2.0% of the capital cost value was estimated. The currently projected incremental O&M costs of $657.7 million for the JCMUA based controls and $1.16 estimated O&M account for the difference in results from the 2019 preliminary analysis.

JCMUA's SIAR projects future capital costs for the Municipal Control Alternative totaling $657.7 million (current dollars) through 2050 and incremental annual O&M costs of $1.16 million under the JCMUA Municipal Control Alternative detailed in the SIAR. This would result in a projected residential indicator in 2051, the first year after full implementation of the controls of 1.3% which would constitute a medium burden under the USEPA analytical guidelines.

The second step of the financial capability analysis documents that JCMUA's current financial capability strength is "mid-range". These two metrics combine on EPA's Financial Capability Matrix to indicate a medium burden under the USEPA guidance for the $657.7 million in capital expenditures proposed under JCMUA's Municipal Control Alternative.

This draft memorandum is based on information provided by JCMUA, PVSC and external sources such as the on-line fiscal reports available through the New Jersey Department of Community Affairs.[1]

The projections and conclusions concerning the affordability of the Municipal Control Alternative proposed in this SIAR by JCMUA and Jersey City's financial capability to finance the CSO control program are premised on the baseline financial conditions of Jersey City as well as the economic conditions in New Jersey and the United States generally at the time that work on this SIAR commenced. While the impacts of the pandemic on the long-term affordability of the CSO LTCP are obviously still unknown, it is reasonable to expect that there will be potentially significant impacts. There are several dimensions to these potential impacts, including reduced utility revenues and household incomes.

2.0 Introduction

2.1 Intent of the Financial Capability Analysis

This document presents the final Financial Capability Analysis (FCA) relating to the development of the CSO Long Term Control Plan (LTCP) required under Paragraph G(8)(a) of the Combined Sewer Management section of a permittee's NJPDES discharge permit. The assessment is based upon the EPA document "Combined Sewer Overflows – Guidance for

[1] https://www.nj.gov/dca/divisions/dlgs/resources/fiscal_rpts.shtml

Financial Capability Assessment and Schedule Development," (EPA Guidance Document) published February 1997[2], as supplemented by EPA's November 2014 memorandum entitled "Financial Capability Assessment Framework for Municipal Clean Water Act Requirements".[3] A preliminary FCA memorandum was provided by PVSC to JCMUA and the other combined sewered permittees within its service area in August of 2019, with a subsequent update in December of 2019.

This final FCA and last year's preliminary versions support the twofold purposes of the FCA as envisioned in the 1994 CSO Control Policy[4] (Policy). First, the FCA is intended to identify the upper limits of what could constitute an affordable future investment strategy as defined by the Policy and related guidance documents under an assumed LTCP implementation schedule; thereby informing the development of CSO, SSO, MS4, TMDL, and other necessary control alternatives. Second, the financial and user cost (affordability) impacts of the selected CSO controls must be assessed to support the development of a workable implementation schedule for the LTCP.[5]

2.2 EPA's Two Step Analysis Process

The Financial Capability assessment is a two phased process. The residential indicator (RI) is the percentage of median household income (MHI) expended on wastewater (including stormwater) management. The upper limit of affordability for wastewater services within the JCMUA service area will be the point where total wastewater management costs for the typical residential user in Jersey City exceed 2.0% of the Median Household Income (MHI). This metric of total wastewater management costs as a percentage of MHI is termed the Residential Indicator (RI) by USEPA.

The financial capability indicator is an assessment of the permittee's debt burden, socioeconomic conditions, and financial operations. These two measures are subsequently entered into a *financial capability matrix*, suggested by EPA, to determine the level of financial burden placed on residential customers and the permittee by the existing and projected future expenditures to operate, maintain, and enhance the wastewater management system. The EPA matrix appears in Table 5.1 of this document.

The projected future expenditures driving the RI and imposing demands upon the financial capability of JCMUA will include the implementation of CSO controls, stormwater controls, conveyance / collection system rehabilitation, in addition to the current debt service and other

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2 EPA 832-B-97-004

3 November 24, 2014 memorandum from Ken Kopocis, Deputy Assistant Administrator, Office of Water (OW) and Cynthia Giles, Assistant Administrator, Office of Enforcement and Compliance (OECA) to Regional Administrators

4 Combined Sewer Overflow Policy Section II-C(8) 59 FR 18694

5 "Schedules for implementation of the long-term CSO control plan may be phased based on the relative importance of adverse impacts upon water quality standards and designated uses, and on a permittee's financial capability." (59 FR 18688)

operational, maintenance, and planned capital improvements to the JCMUA sewer system that have been identified and provided by the City for inclusion into this analysis.

2.3 Limitations to the EPA Analytical Framework

EPA's 1997 financial capability guidance calls for the use of a simplistic "snap shot" model which assumes that all future expenditures are incurred simultaneously and that costs and incomes should be based on current dollars. This approach has the advantage of eliminating the need to estimate future rates of inflation and income growth. However, this approach can understate the affordability impact of long-term programs since income growth has not kept pace with and is not projected to keep pace with water utility capital and O&M cost inflation. For example, for the period of 1999 through 2013, the national costs for typical household wastewater services increased at a rate of 4.8%.[6] The national Consumer Price Index increased at an annual rate of around 2.4%[7] for the period while the US median household income increased from around $42,000 to $52,250 at an annual rate of 1.6%.[8]

An affordability analysis that does not account for the continuing divergence between wastewater utility costs and income growth over course of a long term implementation schedule will overstate the "affordability" of the LTCP as future costs are recovered from the residential and other system users. Conversely, including current permittee expenditures or debt service payments which would end before the costs from the CSO controls are paid can understate future affordability.

EPA's November 24, 2014 memorandum encourages the use of a time-based ("dynamic" model per the memo) model to supplement the snapshot approach. PVSC has developed a time-based model that calculates annual costs and revenue requirements based on assumed program costs, schedules and economic variables such as interest and inflation rates. The residential indicator is calculated for each year based upon the costs per typical residential users which changes annually based on the annual system revenue requirements.

An additional limitation to the EPA methodology is its focus on the median household income (MHI) which therefore does not address the affordability impacts of wastewater service costs on the lower income households in JCMUA's or any service area. By definition, one half of the households in Jersey City would be paying more than 1.0% of their household income for wastewater services when the residential indicator for the MHI equals 1.0%.

Three of the six EPA financial capability metrics focus on general obligation (G.O.) bond rating criteria which are amortized through property tax or other general revenue streams:

- Overall Net Debt as a Percentage of Full Market Property Value;
- Property Tax Revenues as a Percent of Full Market Property Value; and
- Property Tax Revenue Collection Rate.

6 NACWA 2013 Cost of Clean Water Index

7 US Bureau of Labor Statistics

8 US Census

The assumption that G.O. bonds will be used would not be appropriate for financing by municipal authorities.

For this analysis only, it is assumed that financing through the New Jersey Environmental Finance Program will be used as necessary to meet projected construction draw requirements. The actual size and timing of financing necessary to implement the CSO controls will be determined by the eventual construction schedules for the various components of the CSO Controls and other wastewater capital improvement needs and are therefore beyond the scope of this document.

In addition to following guidelines for the affordability and financial capability metrics, EPA encourages inclusion of any information that would have a financial impact on the permittee in the capability report. This assessment, therefore, includes additional discussion of socioeconomic trends in Jersey City because of the financial challenges that the municipality faces.

3.0 Affordability Assessment

3.1 Baseline (2019) Wastewater Services Affordability

The Residential Indicator is an approximation of households' abilities to pay their total wastewater costs and is derived by dividing the total annual wastewater costs for the typical household within the permittee's (JCMUA's) service area by the median household income within the service area. The Residential Indicator is compared to EPA-defined criteria to determine whether total annual wastewater costs impose a low, mid-range, or high impact on residential users. Table 3-1 shows U.S. EPA's Residential Indicator criteria, which define a "low" impact as a cost per household (CPH) less than 1.0% median household income (MHI), a "mid-range" impact between 1.0 and 2.0%, and "high" impact as greater than 2.0% of MHI.

Table 3-1. EPA Residential Indicator

Residential Indicator	Cost per Household
Low Burden	Less than 1.0 percent of MHI
Mid-Range Burden	1.0-2.0 percent of MHI
High Burden	Greater than 2.0 percent of MHI

The estimated annual cost for wastewater services for a typical single-family residential user for 2019 is $482. This estimate is based on the use of 4,500 gallons per month of potable water. Based on the estimated MHI of $65,300 the Residential Indicator is approximately 0.7%, constituting a low burden under the EPA metrics. By definition the current residential indicator for one half of the households is greater than the 0.7%.

In Jersey City, 18.7% of the population was living below the poverty line in 2017. The total Census households are broken out by income brackets on Table 3-2 below, along with the respective current Residential Indicators by income bracket. The RI for each bracket was

calculated from the mid-point income within the bracket. At the lowest income levels, the current RI is already between 2.1% and 8.3%.

Table 3-2. Analysis of the Current Residential Indicator

Income Bracket	Households		Bracket Average Income	Bracket RI at Typical Cost per Household
	Number	Cumulative		
Less than $10,000	8,818	8,818	$5,000	8.34%
$10,000 to $14,999	5,377	14,195	$12,500	3.34%
$15,000 to $24,999	9,457	23,652	$20,000	2.09%
$25,000 to $34,999	7,901	31,553	$30,000	1.39%
$35,000 to $49,999	10,331	41,884	$42,500	0.98%
$50,000 to $74,999	14,468	56,352	$62,500	0.67%
$75,000 to $99,999	10,216	66,568	$87,500	0.48%
$100,000 to $149,999	15,064	81,632	$125,000	0.33%
$150,000 to $199,999	7,961	89,593	$175,000	0.24%
$200,000 or more	10,456	100,049	$200,000	0.21%
Total	100,049			

3.2 Affordability Impacts of the Selected CSO Control Alternatives

JCMUA has identified a long term CSO control strategy that will achieve 85% capture of wet weather flows during the typical year. These controls are summarized on Table 3-3.

Table 3-3 – JCMUA's Selected CSO Controls

Wet Weather Control Types	Municipal Control Alternative	
	Capital Costs ($ millions)	Incremental Annual O&M Costs ($ millions)
I/I Source Control	$36.80	$0.00
Sewer Separation	$10.80	$0.00
Green Infrastructure	$92.1	$0.42
Storage Tank @ JC001, JC002	$104.8	$0.15
Storage Tank @ JC003, JC004, JC005	$116.7	$0.16
Storage Tank @ JC006, JC007	$157.4	$0.19
Storage Tank @ JC011, JC013	$78.2	$0.13
Storage Tank @ JC028, JC029	$60.9	$0.11
Totals	***$657.7***	***$1.16***

Implementation of the $657.7 million JCMUA Municipal Control Alternative through 2050 results in projected annual costs per typical single family user of $703 (without inflation) and a

residential indicator of 1.1%. Accounting for inflation, annual costs would grow to $1,652 with a residential indicator of 1.3% in 2051 as presented in Table 3-4.

Table 3-4 – JCMUA Projected Residential Indicator Upon Full Implementation of the CSO Control Program

Metric	Baseline (2019)	Cost per Typical Residential Wastewater User in 2051			
		No LTCP		Municipal Control Alternative	
		With Inflation	Without Inflation	With Inflation	Without Inflation
RI	0.7%	0.9%	0.8%	1.3%	1.1%
Annual $	$482	$1,082	$506	$1,652	$703

Key points from Table 3-4 are:

- The base year (2019) cost per typical single family wastewater user for JCMUA was calculated to be $482_ based on a monthly water consumption of 4,500 gallons. Based on a 2019 median household income of $65,300 this works out to a RI of 0.7%.
- The costs per typical single family user in 2051 is projected to increase to $1,082 annually without implementing the CSO controls due to inflation. This would represent a RI of 0.9%.
- Implementing a $657.7 million Municipal Control Alternative with capital costs completed in 2050 would result in annual costs per typical single family user of $1,652 in 2051, which works out to a 1.3% RI in 2051.
- The analysis does not reflect the current and lingering financial impacts as a result of the COVID -19 pandemic and should be revisited upon finalizing the LTCP implementation schedule.

3.3 Underlying Assumptions

Key assumptions used in the above analysis are summarized on Table 3-5. An annotated complete list of all data and assumptions used in the affordability model is provided as an appendix to this memorandum.

Table 3-5 – Affordability Model Key Inputs and Assumptions

Item	Value	Notes
Finance		
Bond Term		
Market Interest Rate	6.0%	NJEIT Financing – Smart Growth program offers 75% funding at 0% interest and 25% funding at market rates for 20 years for CSO control projects.
NJDEP	0.0%	
Blended Interest Rate	1.5%	
Target Coverage	125.00%	

Table 3-5 – Affordability Model Key Inputs and Assumptions

Item	Value	Notes
O&M as % of Capital Cost	1.0%	
Economic		
LTCP O&M Inflation	4.0%	Based on national rates of wastewater system O&M costs in 2017 NACWA study.
LTCP Construction Inflation	3.7%	Based on 1984 – 2015 ENR Construction Cost Index for New York City (80%) and Philadelphia (20%).
Estimate Base Year		
MHI Data Year	2015	
Typical Household Monthly Consumption	4,500	Typical urban water consumption.
Demographic		
JCMUA Residential Connections		Municipal account data
Jersey City MHI	$34,800	American Community Survey Five Year Estimate 2013 – 2017 (inflated by Census to 2017)
Residential Share of Billed Water Consumption		Municipal account data.

4.0 Analysis of Financial Capability Indictors

The second part of the financial capability assessment - calculation of the financial capability indicator for the permittee - includes six items that fall into three general categories of debt, socioeconomic, and financial management indicators. The six items are:

- Bond rating
- Total net debt as a percentage of full market real estate value
- Unemployment rate
- Median household income
- Property tax revenues as a percentage of full market property value
- Property tax revenue collection rate

Each item is given a score of three, two, or one, corresponding to ratings of strong, mid-range, or weak, according to EPA-suggested standards. The overall financial capability indicator is then derived by taking a simple average of the ratings. This value is then entered into the financial capability matrix to be compared with the residential indicator for an overall capability assessment). Table 4-1 contains the six criteria and the ratings that categorize the permittee as strong, mid-range, or weak in each category. A discussion of each item follows.

Table 4-1 Permittee Financial Capability Indicator Benchmarks

Indicator	Strong (3)	Mid-Range (2)	Weak (1)
Bond Rating	AAA-A (S&P) or Aaa-A (Moody's)	BBB (S&P) or Baa (Moody's)	BB-D (S&P) of Ba-C (Moody's)
Overall Net Debt as a Percent of Full Market Property Value	Below 2%	2% to 5%	Above 5%
Unemployment Rate	More than 1% below the National Average	+/- 1% of the National Average	More than 1% above the National Average
Median Household Income	More than 25% above National MHI	+/- 25% above National MHI	More than 25% below National MHI
Property Tax as a Percent of Full Market Property Value	Below 2%	2% to 4%	Above 4%
Property Tax Collection Rate	Above 98%	94% to 98%	Below 94%

As noted above, these metrics are most applicable to municipalities issuing general obligation debt and as such should be read as applying primarily to the City of Jersey City rather than to the Jersey City Municipal Utilities Authority (MUA).

4.1 Bond Rating – Indicator 1

Jersey City's has bond ratings of Aa3 (Moody's Investor Services) and Standard & Poors (AA). These favorable ratings result in a "strong" rating under the USEPA financial capability metrics.

4.2 Direct Net Debt as a Percent of Full Market Value – Indicator 2

Debt Burden is measured by overall net debt as a percent of the three-year average property valuation which was 22.3 billion in 2017.[9] Direct Net Debt is defined as current net liability to be repaid by property taxes divided by the municipality's property valuation. This indicator is relevant as a metric for municipalities issuing general obligation bonds which are substantially repaid through property tax revenues. The Jersey City General Bonded Debt totaled $1.06 billion as of 2017.[10] The percent of total net debt to property valuation was 2.04%. Overall net debt as a percent of full market property value places Jersey City in the midrange on this measure.

4.3 Unemployment Rate – Indicator 3

The unemployment rate is used as an assessment of the economic well-being of residential users in the service area. The dataset for the municipal unemployment rates is taken from the US Census American Community Survey 2013-2017 estimates for the population over age 16. The American Community Survey gathers data over a 5-year period. The prevailing unemployment rate provided by the ACS for that timeframe more closely represents the actual strength of the economy in a municipality. The unemployment rate for Jersey City was at 7.3% compared to

9 Source: 2017 NJDCA User Friendly Budget Sheet UFB-10

the national rate of 6.6% for the same time period. It may be noted that the "weak" rating is triggered in the EPA table when the local unemployment rate is one percent above the national average. It should also be noted that the above statistics are for Jersey City and should not be confused with Bureau of Labor Statistics data for the New York – Newark SMSA.

4.4 Median Household Income – Indicator 4

Median Household Income (MHI) divides the relevant incomes of a population into two parts so that half of the incomes are below the median and half of the incomes are above the median. Unlike average income, median income is not skewed by extremely high or extremely low incomes in the dataset. Table 4-2 shows that the MHI within the Jersey City is around eight percent higher than the national average, resulting in a midrange rating per the EPA metric.

Table 4-2 Median Household Income

	Median Household Income[10]
Jersey City	$62,700
United States	$57,650
% Difference	+8.8%
Categorization	Midrange

4.5 Property Tax Revenues as a % of Full Market Value – Indicator 5

The three-year average property valuation in Jersey City was $22.3 billion per the 2017 NJDCA User Friendly Budget. Municipal property taxes levied of $469.2 million was approximately 2.1% of the three year average equalization value provided on the municipal information sheet, resulting in a midrange rating for this metric.

4.6 Property Tax Collection Rate – Indicator 5

The EPA criterion for a strong rating in this category is a collection rate of more than 98%. Jersey City's rate is estimated to be 94%, which places it in the weak range for real estate tax collections.

4.7 Financial Indicator Score

As shown on Table 4-3, the overall score for the financial indicators is 2.0, yielding an EPA Qualitative Score of midrange. This calculation is based on the use of all six of the indicators that are applicable to Jersey City.

10 Source: US Census – National Community Survey estimates for 2013 - 2017

Table 4-3 – JCMUA Financial Capability Indicator Benchmarks

Indicator	Rating	Numeric Score
Bond Rating	High	3
Overall Net Debt as a Percent of Full Market Property Value	Midrange	2
Unemployment Rate	Midrange	2
Median Household Income	Midrange	2
Property Tax as a Percent of Full Market Property Value	Midrange	2
Property Tax Collection Rate	Weak	1
	Total	12
	Overall Indicator Score: (numeric score / number of applicable indicators)	2.0
	EPA Qualitative Score	Midrange

5.0 Financial Capability Matrix

In this section the results of the step 1 affordability analysis which goes towards the residential ratepayers' ability to afford CSO controls within the context of other capital investment needs is integrated with the step 2 (Financial Capability) analysis which goes towards the permittee's ability to finance the implementation of the LTCP.

It was established previously that capital expenditures for the JCMUA Municipal Control Alternative of $657.7 million through 2050 would result in a Residential Indicator at 1.3% or what the EPA metrics would consider a medium burden.

The overall Jersey City financial capability rating considered to be midrange under the EPA framework. The intersection of these two ratings on the EPA financial capability matrix places the Jersey City sewer system in the category of medium financial burden, as shown on Table 5-1.

Table 5-1 – The Financial Capability Matrix - (Shaded areas Indicate JCMUA's Ratings)

Permittee Financial Capability Indicators Score	Residential Indicator		
(Socioeconomic, Debt and Financial Indicators)	Low (Below 1.0%)	Mid-Range (Between 1.0 and 2.0%)	High (Above 2.0%)
Weak (Below 1.5)	Medium Burden	High Burden	High Burden
Mid-Range (Between 1.5 and 2.5)	Low Burden	**Medium Burden**	High Burden
Strong (Above 2.5)	Low Burden	Low Burden	Medium Burden

6.0 Additional Economic Factors

In addition to following EPA guidelines for completion of the financial capability assessment matrix, a discussion of socioeconomic trends in the Jersey City sewer system area is essential to the consideration of scheduling and compliance levels with CSO guidelines.

6.1 Cost of Living Factors

6.1.1 Cost of Living Index

Specific cost of living comparisons of Jersey City and national averages are not available. However, the cost of living for the Cities of Elizabeth and Newark is approximately 30% higher than the national average.[11] Using this value as a proxy, households in Jersey City face costs of living that are about 30% higher than the national average while earning an income that is about 9% higher than the national median income. Put another way, adjusting for the cost of living, the effective MHI in Jersey City is about 84% of the national MHI.

6.1.2 Housing Costs

One of the major drivers in the higher cost of living in Jersey City is the cost of housing. Housing costs in Jersey City are approximately 169%[12] of the national average. The Residential Indicator is a national screening parameter and does not account for localized factors which erode the effective household income. Based upon a 2017 study[13] by the National Low Income Housing Coalition, the fair market value of a two bedroom apartment in Hudson County was $1,519 per month which works out to around 29% of the Jersey City median household income.

6.1.3 Local Tax Burdens

The property tax burdens within the combined sewered municipalities of the PVSC service area are substantial. The average residential tax for 2017 in Jersey City was $7,191. This includes Jersey City taxes of $3,426 along with Hudson County and school district taxes.[14] This compares with a national average local property tax levy of $3,500 for a similarly priced home. Moreover, as housing prices are higher in the New York – Newark metropolitan area than nationally, houses costing well over the national median value of $193,500 are purchased by families of modest incomes.

The high housing costs and tax burdens facing Jersey City households reduces their effective household income. Consequently, measuring the household burden imposed by wastewater costs as a percentage of the median household income may underestimate the financial burden of the projected wastewater costs per household. As was noted in an analysis of the impacts of CSO controls in the Boston region:

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11 http://www.infloplease.com/business/economy/cost of living - index.us-cities html

12 Using the Newark – Elizabeth cost of living indices.

13 Out of Reach 2017 – The High Cost of Housing National Low Income Housing Coalition.

14 Source: 2017 NJDCA User Friendly Budget sheet UFB-1

"The greater are the costs of other necessities as a share of MHI, the greater will be the economic burden associated with sewer charges equal to a given percent of MHI." [15]

6.2 Poverty Factors

6.2.1 Poverty Rate

In 2017 18.7% of the population in Jersey City was living below the poverty line. This compares to the national average poverty rate of 14.6%.

6.2.2 Household Income Brackets

When the Residential Indicator is 1.3% of median household income, by definition half of the households in Jersey City would be paying more than 1.3% of their household incomes for wastewater services. In areas with large percentages of low income households, the impacts of a 2.0% RI can be severe. As shown on Table 6-1 around 32% of the households would be paying well over 2.0% of their household incomes for wastewater services.

Table 6-1 – Impact of the Municipal Control Alternative on the Residential Indicator

Income Bracket	Households		Estimated Population		RI @ 2% of MHI	Bracket Average Income
	Number	Cumulative	Number	Cumulative		
Less than $10,000	8,818	8,818	23,438	23,438	17.5%	$5,000
$10,000 to $14,999	5,377	14,195	14,292	37,731	7.0%	$12,500
$15,000 to $24,999	9,457	23,652	25,137	62,867	4.4%	$20,000
$25,000 to $34,999	7,901	31,553	21,001	83,868	2.9%	$30,000
$35,000 to $49,999	10,331	41,884	27,460	111,328	2.1%	$42,500
$50,000 to $74,999	14,468	56,352	38,456	149,785	1.4%	$62,500
$75,000 to $99,999	10,216	66,568	27,154	176,939	1.0%	$87,500
$100,000 to $149,999	15,064	81,632	40,040	216,979	0.7%	$125,000
$150,000 to $199,999	7,961	89,593	21,160	238,140	0.5%	$175,000
$200,000 or more	10,456	100,049	27,792	265,932	0.4%	$200,000
Total	100,049		265,932			

6.2.2 Income Growth Trends

The Jersey City MHI growth between 2000 and 2017 was about 3.0% annually. This growth rate compares with the growth rates for New Jersey (1.9%) and for the U.S. (1.8%). For purposes of this analysis the rate of growth for Jersey City is projected to be 2.0% through 2042.

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[15] Assessment of the Economic Impact of Additional Combined Sewer Overflow Controls in the Massachusetts Water Resource Authority Service Area (page 13) prepared by Robert N. Stavins, Genia Long, and Judson Jaffee. Analysis Group Incorporated, August 2004.

6.2.3 New Jersey Department of Community Affairs Municipal Revitalization Index

New Jersey's Municipal Renewal Index[6-16] measures the social, economic, physical and financial conditions of the 565 municipalities within New Jersey. The MRI is compiled by the NJ Department of Community Affairs and is used in the distribution of needs based funding. Six primary along with four secondary criteria are used:

Primary Criteria

- Children on TANF (Temporary Assistance for Needy Families) per 1,000 persons
- Unemployment Rate
- Poverty Rate
- High school diploma or higher
- Median Household Income
- Percent of households receiving SNAP (food stamps)

Secondary Criteria

- Ten year rate of change in population
- Non-seasonal housing vacancy rate
- Equalized three year effective property tax rate
- Equalized property valuation per capita

The 2017 state-wide MRI rankings for the combined sewered municipalities within the PVSC service area are shown on Table 6-2. The Jersey City has a ranking of 64th most distressed municipality out of 565 statewide.

Table 6-2 – Municipal Renewal Index for the PVSC Combined Sewered Municipalities

Municipality	2017 Municipal Revitalization Index			Percentile of Least Resourced Municipalities
	MRI Score	MRI Distress Score	MRI Rank	
Bayonne	-4.56	40.2	82	15%
East Newark	-5.71	43.4	65	12%
Guttenberg	-5.12	41.8	70	12%
Harrison	-4.49	40.0	87	15%
Jersey City	**-5.80**	**43.7**	**64**	**11%**

[6-16] Measuring Distress in New Jersey: the 2017 Municipal Revitalization Index Office of Policy and Regulatory Affairs, New Jersey Department of Community Affairs.

Municipality	2017 Municipal Revitalization Index			Percentile of Least Resourced Municipalities
	MRI Score	MRI Distress Score	MRI Rank	
Kearny	-3.67	37.7	106	19%
Newark	-16.53	73.5	12	2%
North Bergen	-4.65	40.5	80	14%
Paterson	-19.43	81.6	8	1%

6.4 Implications of the Additional Economic Factors

The additional economic factors presented above were intended to provide additional context to the affordability and financial capability scores determined in this initial FCA. The context of this FCA and of the implementation of the LTCP is a combined sewered community with household incomes well below the federal and state levels, high poverty rates, and high local tax burdens. Jersey City's ability to afford additional CSO controls beyond those outlined in this memorandum is and is likely to remain restricted.

7.0 Potential Impacts of the COVID-19 Pandemic on Affordability

The projections and conclusions concerning the affordability of the CSO control program proposed in this SIAR by JCMUA and JCMUA's financial capability to finance the CSO control program are premised on the baseline financial conditions of Jersey City as well as the economic conditions in New Jersey and the United States generally at the time that work on this SIAR commenced. While the impacts of the pandemic on the long-term affordability of the CSO LTCP are obviously still unknown, it is reasonable to expect that there will be potentially significant impacts. There are several dimensions to these potential impacts, including reduced utility revenues and household incomes.

7.1 Potential Wastewater Utility Revenue Impacts

This Financial Capability Assessment cannot reflect the currently unknowable impacts on wastewater utility revenues stemming from the national economic upheaval resulting from the COVID-19 pandemic. It is however extremely likely that Jersey City and municipal wastewater utilities in general across the United States will face significant and potentially permanent declines in revenues from households unable to pay their water and sewer bills and the sudden decline in industrial and commercial demands for potable water and wastewater treatment.

On March 20, 2020 the National Association of Clean Water Agencies (NACWA) issued a press release stating that:

> **"NACWA conservatively estimates the impact to clean water utilities nationwide of lost revenues due to coronavirus at $12.5 Billion.** This isa low-end estimate, assuming an average loss of revenue of 20% which is well within the range of what individual utilities are already projecting. Some utilities are anticipating closer to a 30% or 40% loss in revenue. This estimate is based on the substantial historical utility financial data

> NACWA has on file through its Financial Survey and recent reports from NACWA members on the decrease in usage they are observing in their systems over the last few weeks."[17]

The impact of a 20% to 40% revenue loss, along with increased costs that have been and will continue to be experienced by water and wastewater utilities such as overtime and the writing off of customer accounts receivable could have a profound impact on the affordability of the proposed CSO controls and JCMUA's ability to finance them.

Most of the costs of a municipal wastewater system are relatively fixed within broad operating ranges. Debt service and other capital costs are fixed once incurred. Some operating costs are somewhat variable with wastewater flows, e.g. chemical and electrical power usage but this variability is lessened by the reality that inflow, infiltration and stormwater flow in a combined system are not affected by billed water consumption. Labor costs are not directly variable, e.g. a twenty percent reduction in billed flow would not result in a need for twenty percent less labor. Maintenance costs might go down somewhat as equipment operating times may be reduced.

As costs do not decline proportionately to billed flow, it can be expected that user charge rates must be raised to generate sufficient revenue to sustain current operations. The relationship between changes in costs and revenues and the resultant changes in user charge rates is complex and has not yet been fully analyzed. At this point it can be assumed that user rate increases may be necessary to simply maintain current operations, and these rate increases will likely erode the financial capability of JCMUA to fund the CSO LTCP.

7.2 Potential Median Household Income Impacts

The impacts of the pandemic on median household incomes in Jersey City cannot be determined at this point. Historical analogies may provide some useful, albeit disturbing, context but are not presented as predictive:

- U.S. median household income fell by 6.2% from $53,000 in 2007 to $49,000 in 2010. In New Jersey, the MHI decreased by around 4.0% for the same period.[18]
- The U.S. unemployment rates rose from 5.0% in December of 2007 to 9.9% in December of 2009.[19]
- Data on impacts of the Great Depression on median household income are not available. As a proxy, the personal income per capita data are available. For 1929 this was $700. By 1933 this figure bottomed out at $376, a decline of 46%. Unemployment for the same period rose from around 3.0% to 25%.[20]

While a quantifiable assessment of the impact of the pandemic on median household income is not feasible at this time, reduction in base year MHI can be expected. This will further

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17 NACWA press release: Coronavirus Impacting Clean Water Agencies; Local Utilities and Ratepayers Need Assistance March 20, 2020

18 Source: Fact Sheet: Income and Poverty Across the States, 2010 Joint Economic Committee, United States Congress, Senator Robert P. Casey, Jr. Chairman.

19 Source: Bureau of Labor Statistics data series LNS1400000

20 Source: Federal Reserve Economic Data (FRED) data series: A792RC0A052NBEA

exacerbate the impacts of the revenue reductions described above on LTCP affordability, as higher base user charge rates will absorb an increased portion of lower MHI.

7.3 Implications for the Long Term CSO Control Program

It is anticipated that the financial implications of the COVID-19 pandemic will be discussed with NJDEP during the review of the SIAR and as the 2021 – 2025 NJPDES permit is developed. Based on the October 1, 2020 revised due date for the SIAR, additional revenue data should be available to support a more specific refinement of this analysis in the SIAR.

Given the current and likely continuing uncertainties as to the New Jersey and national economic conditions, JCMUA will be reticent to commit to long term capital expenditures for CSO controls without the incorporation of adaptive management provisions, including provisions to revise and reschedule the long term CSO controls proposed in this SIAR based on emergent economic conditions beyond the permittees' control. As detailed in Section F of JCMUA's SIAR, these provisions could include scheduling the implementation of specific CSO control measures to occur during the five year NJPDES permit cycles. A revised affordability assessment should be performed during review of the next NJPDES permit to identify controls that are financially feasible during that next permit period.

8.0 Conclusion

The 1997 EPA guidance indicates that ratepayers and permittees who are highly burdened future expenditures added to their current wastewater treatment, conveyance, and collection costs can be allowed 15 years to complete capital projects to handle CSOs. In extreme cases, the guidance suggested a 20-year compliance schedule might be negotiated.[21]

The affordability analysis detailed above has documented that the $657.7 million (current dollars) Municipal Control Alternative documented in JCMUA's SIAR along with related operation and maintenance costs would result in a Residential Indicator of "medium impact" under EPA's criteria. Using the potential regional control approach would also result in a "medium impact".

Circa 1997 EPA metrics notwithstanding, the reality of the higher than national average poverty rates, low effective household incomes compared to the rest of New Jersey and nationally and the high costs of living in Jersey City argue strongly that the EPA metric understates the impacts of the CSO control costs on the residents of the City. As evidenced by its New Jersey Municipal Revitalization Index score in the top 89th percentile, JCMUA's capacity for additional CSO controls beyond those proposed in the SIAR is limited.

[21] Combined Sewer Overflows – Guidance for Financial Capability Assessment and Schedule Development, EPA 832-B-97-004, Page 46.

Memorandum

To: *Town of Kearny, New Jersey*

Copy: *Thomas Laustsen, Sheldon Lipke, Mike Hope, Tim Dupuis, Scott Craig*

From: *Tom Schevtchuk*

Date: *September 10, 2020*

Subject: *Final Financial Capability Assessment for Kearny*

1.0 Executive Summary

This Financial Capability Analysis (FCA) memorandum is in support of the Municipal Control Alternative identified in the Selection and Implementation of Alternatives (SIAR) developed by the Town of Kearny. It quantifies the projected affordability impacts of Kearny's proposed long term CSO controls for the Kearny combined sewer system (CSS) and updates the 2019 preliminary FCA memo that was intended to guide the development and selection of long term controls.

Table E-1 - Projected Impacts of CSO Controls at a Glance

Typical Household 2019	
Annual Wastewater Costs	$499
Residential Indicator (RI)*	0.8%
Median Household Income (MHI)	$64,400
LTCP Control Program	
CSO Control Capital Costs ($ millions)	$69.9
First Year After Full Implementation	2051
LTCP Impact on Typical Household Cost In	2051
Median Household Income (MHI)	$111,100
Annual Costs Without LTCP	$1,258
Residential Indicator Without LTCP	1.1%
Annual Costs With LTCP	$2,189
Residential Indicator With LTCP	2.0%

* Percent of median household income spent for wastewater services.

As summarized in Table E-1, this FCA includes the projected impacts if the CSO controls are undertaken by Kearny alone (Municipal Control Alternative) based on the costs and programs included in Kearny's SIAR Section F. For this analysis, the assumed implementation period for construction of the CSO controls is 2021 through 2050.

While a regional alternative would result in lowered overall costs for the control of CSOs within the PVSC service area, the basis of this allocation remains under discussion as of the writing of this memorandum. Under this approach, both the costs of the regional facilities such as a relief interceptor and the resultant savings would be allocated amongst the PVSC municipalities with combined sewer systems. As the basis of this allocation remains under discussion as of the writing of this SIAR, this FCA memorandum focuses on implementation of the Municipal Control Alternative. Should the permittees come to agreement on the cost allocation for the Regional Control Plan, the FCA will be revisited to reassess the affordability and schedule for implementation of the LTCP.

The Financial Capability assessment is a two-step process including ***Affordability*** which evaluates the impact of the CSO control program on the residential ratepayers and ***Financial***

Capability which examines a permittee's ability to finance the program. Affordability is measured in terms of the Residential Indicator (RI) which is the percentage of median household income spent on wastewater services. Total wastewater services exceeding 2.0% of the median household income are considered to impose a high burden by USEPA. The financial capability analysis uses metrics similar to the municipal bond rating agencies.

The 2019 preliminary FCA determined that future capital expenditures for CSO controls and all other capital expenditures of approximately $65.0 million (current dollars) over a twenty-year period (2022 through 2041) would result in a RI exceeding 2.0% using a dynamic (time sensitive) model which accounts for future inflation. Along with the calculated debt service costs associated with the $65 million in capital costs an annual incremental operations and maintenance (O&M) cost of $1.3 million or 2.0% of the capital cost value was estimated.

Kearny's SIAR projects future capital costs for the Municipal Control Program totaling $69.9 million. For this analysis the implementation of the capital improvements is assumed to run through 2050 pending a detailed implementation schedule from Kearny. No incremental annual O&M costs were identified. This would result in a projected residential indicator in 2051, the first year after full implementation of the controls, of 2.0% which would constitute the low end of a high burden under the USEPA analytical guidelines.

The second step of the financial capability analysis documents that Kearny's current financial capability strength is "mid-range". These two metrics combine on EPA's Financial Capability Matrix to indicate a high burden under the USEPA guidance for the $69.9 million in capital expenditures proposed under Kearny's Municipal Control Alternative.

This draft memorandum is based on information provided by Kearny, PVSC and external sources such as the on-line fiscal reports available through the New Jersey Department of Community Affairs.[1]

The projections and conclusions concerning the affordability of the Municipal Control Alternative proposed in this SIAR by Kearny and Kearny's financial capability to finance the CSO control program are premised on the baseline financial conditions of Kearny as well as the economic conditions in New Jersey and the United States generally at the time that work on this SIAR commenced. While the impacts of the pandemic on the long-term affordability of the CSO LTCP are obviously still unknown, it is reasonable to expect that there will be potentially significant impacts. There are several dimensions to these potential impacts, including reduced utility revenues and household incomes.

2.0 Introduction

2.1 Intent of the Financial Capability Analysis

This document presents the final Financial Capability Analysis (FCA) relating to the development of the CSO Long Term Control Plan (LTCP) required under Paragraph G(8)(a) of the Combined Sewer Management section of a permittee's NJPDES discharge permit. The assessment is based upon the EPA document "Combined Sewer Overflows – Guidance for

[1] https://www.nj.gov/dca/divisions/dlgs/resources/fiscal_rpts.shtml

Financial Capability Assessment and Schedule Development," (EPA Guidance Document) published February 1997[2], as supplemented by EPA's November 2014 memorandum entitled "Financial Capability Assessment Framework for Municipal Clean Water Act Requirements".[3] A preliminary FCA memorandum was provided by PVSC to Kearny and the other combined sewered permittees within its service area in August of 2019, with a subsequent update in December of 2019.

This final FCA and last year's preliminary version supports the twofold purposes of the FCA as envisioned in the 1994 CSO Control Policy[4] (Policy). First, the FCA is intended to identify the upper limits of what could constitute an affordable future investment strategy as defined by the Policy and related guidance documents under an assumed LTCP implementation schedule; thereby informing the development of CSO, SSO, MS4, TMDL, and other necessary control alternatives. Second, the financial and user cost (affordability) impacts of the selected CSO controls must be assessed to support the development of a workable implementation schedule for the LTCP.[5]

2.2 EPA's Two Step Analysis Process

The Financial Capability assessment is a two phased process. The residential indicator (RI) is the percentage of median household income (MHI) expended on wastewater (including stormwater) management. The upper limit of affordability for wastewater services within Kearny will be the point where total wastewater management costs for the typical residential user in Kearny exceed 2.0% of the Median Household Income (MHI). This metric of total wastewater management costs as a percentage of MHI is termed the Residential Indicator (RI) by USEPA.

The financial capability indicator is an assessment of Kearny's debt burden, socioeconomic conditions, and financial operations. These two measures are subsequently entered into a *financial capability matrix*, suggested by EPA, to determine the level of financial burden placed on residential customers and Kearny by the existing and projected future expenditures to operate, maintain, and enhance the wastewater management system. The EPA matrix appears in Table 5.1 of this document.

The projected future expenditures driving the RI and imposing demands upon the financial capability of Kearny will include the implementation of CSO controls, stormwater controls, conveyance / collection system rehabilitation, in addition to the current debt service and other

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2 EPA 832-B-97-004

3 November 24, 2014 memorandum from Ken Kopocis, Deputy Assistant Administrator, Office of Water (OW) and Cynthia Giles, Assistant Administrator, Office of Enforcement and Compliance (OECA) to Regional Administrators

4 Combined Sewer Overflow Policy Section II-C(8) 59 FR 18694

5 "Schedules for implementation of the long-term CSO control plan may be phased based on the relative importance of adverse impacts upon water quality standards and designated uses, and on a permittee's financial capability." (59 FR 18688)

operational, maintenance, and planned capital improvements to the Kearny sewer system that have been identified and provided by the Town for inclusion into this analysis.

2.3 Limitations to the EPA Analytical Framework

EPA's 1997 financial capability guidance calls for the use of a simplistic "snap shot" model which assumes that all future expenditures are incurred simultaneously and that costs and incomes should be based on current dollars. This approach has the advantage of eliminating the need to estimate future rates of inflation and income growth. However, this approach can understate the affordability impact of long-term programs since income growth has not kept pace with and is not projected to keep pace with water utility capital and O&M cost inflation. For example, for the period of 1999 through 2013, the national costs for typical household wastewater services increased at a rate of 4.8%.[6] The national Consumer Price Index increased at an annual rate of around 2.6%[7] for the period while the US median household income increased from around $42,000 to $52,250 at an annual rate of 1.6%.[8]

An affordability analysis that does not account for the continuing divergence between wastewater utility costs and income growth over course of a long term implementation schedule will overstate the "affordability" of the LTCP as future costs are recovered from the residential and other system users. Conversely, including current permittee expenditures or debt service payments which would end before the costs from the CSO controls are paid can understate future affordability.

EPA's November 24, 2014 memorandum encourages the use of a time-based ("dynamic" model per the memo) model to supplement the snapshot approach. PVSC has developed a time-based model that calculates annual costs and revenue requirements based on assumed program costs, schedules and economic variables such as interest and inflation rates. The residential indicator is calculated for each year based upon the costs per typical residential users which changes annually based on the annual system revenue requirements.

An additional limitation to the EPA methodology is its focus on the median household income (MHI) which therefore does not address the affordability impacts of wastewater service costs on the lower income households in Kearny's or any service area. By definition, one half of the households in Kearny would be paying more than 1.0% of their household income for wastewater services when the residential indicator for the MHI equals 1.0%.

Three of the six EPA financial capability metrics focus on general obligation (G.O.) bond rating criteria which are amortized through property tax or other general revenue streams:

- Overall Net Debt as a Percentage of Full Market Property Value;
- Property Tax Revenues as a Percent of Full Market Property Value; and
- Property Tax Revenue Collection Rate.

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6 NACWA 2013 Cost of Clean Water Index

7 US Bureau of Labor Statistics

8 US Census

The assumption that G.O. bonds will be used would not be appropriate for financing by municipal authorities.

For this analysis only, it is assumed that financing through the New Jersey Environmental Finance Program will be used as necessary to meet projected construction draw requirements. The actual size and timing of financing necessary to implement the CSO controls will be determined by the eventual construction schedules for the various components of the CSO Controls and other wastewater capital improvement needs and are therefore beyond the scope of this document.

In addition to following guidelines for the affordability and financial capability metrics, EPA encourages inclusion of any information that would have a financial impact on the permittee in the financial capability analysis. This assessment, therefore, includes additional discussion of socioeconomic trends in Kearny because of the financial challenges that the municipality faces.

3.0 Affordability Assessment

3.1 Baseline (2019) Wastewater Services Affordability

The Residential Indicator is an approximation of households' abilities to pay their total wastewater costs and is derived by dividing the total annual wastewater costs for the typical household within the Kearny service area by the median household income within the service area. The Residential Indicator is compared to EPA-defined criteria to determine whether total annual wastewater costs impose a low, mid-range, or high impact on residential users. Table 3-1 shows U.S. EPA's Residential Indicator criteria, which define a "low" impact as a cost per household (CPH) less than 1.0% median household income (MHI), a "mid-range" impact between 1.0 and 2.0%, and "high" impact as greater than 2.0% of MHI.

Table 3-1. EPA Residential Indicator

Residential Indicator	Cost per Household
Low Burden	Less than 1.0 percent of MHI
Mid-Range Burden	1.0-2.0 percent of MHI
High Burden	Greater than 2.0 percent of MHI

3.1.1 Estimated Baseline (2019) Wastewater Cost Per Household

The estimated annual cost for wastewater services for a typical single-family residential user for 2019 is $499. This estimate is based on typical residential potable water usage is 4,500 gallons monthly. Based on the estimated MHI of $64,400 the Residential Indicator is approximately 0.8%, or at the border between what the EPA guidance defines as a low burden and a medium burden. By definition the current residential indicator for one half of the households is greater than the 0.8%.

In Kearny, 11.7% of the population was living below the poverty line. This compares to the national average poverty rate of 14.6%. The total Census households are broken out by income brackets on Table 3-2 below, along with the respective current Residential Indicators by income

bracket. The RI for each bracket was calculated from the mid-point income within the bracket. At the lowest income levels, the current RI is already between 4% and 10%.

Table 3-2. Analysis of the Current Residential Indicator

Income Bracket	Households		Bracket Average Income	Bracket RI at Typical Cost per Household
	Number	Cumulative		
Less than $10,000	671	671	$5,000	9.99%
$10,000 to $14,999	381	1,052	$12,500	4.00%
$15,000 to $24,999	1,230	2,282	$20,000	2.50%
$25,000 to $34,999	962	3,244	$30,000	1.66%
$35,000 to $49,999	2,011	5,255	$42,500	1.18%
$50,000 to $74,999	2,720	7,975	$62,500	0.80%
$75,000 to $99,999	1,810	9,785	$87,500	0.57%
$100,000 to $149,999	2,196	11,981	$125,000	0.40%
$150,000 to $199,999	1,025	13,006	$175,000	0.29%
$200,000 or more	467	13,473	$200,000	0.25%
Total	13,473			

3.2 Affordability Impacts of the Selected CSO Control Alternatives

Permittee has identified a long term CSO control strategy that will achieve 85% capture of wet weather flows during the typical year. These controls are summarized on Table 3-3.

Table 3-3 – Kearny's Selected CSO Controls

Wet Weather Control Types	Capital Costs ($ millions)	Incremental Annual O&M Costs ($ millions)
Sewer Separation at KE010 (34 ac.)	$10.2	$0.0
Sewer Separation at KE006 (199 ac.)	$59.7	$0.0
Total	$69.9	$0.0

Implementation of the $69.9 million Municipal Control Alternative results in projected annual costs per typical single family user of $848 (without inflation) and a residential indicator of 1.3% in 2051, the first year after the projected full implementation of the controls ending in 2050. Accounting for inflation, annual costs would grow to $2,189 with a residential indicator of 2.0% in 2051 as shown in Table 3-4.

Table 3-4 – Kearny's Projected Annual Costs and Residential Indicator Upon Full Implementation of the Municipal Control Alternative

Metric	Baseline (2019)	Cost per Typical Residential Wastewater User in 2051			
		No LTCP		LTCP Implementation Completed in 2050	
		With Inflation	Without Inflation	With Inflation	Without Inflation
RI	0.8%	1.1%	0.8%	2.0%	0.8%
Annual $	$499	$1,258	$499	$2,189	$848

Key points from Table 3-4 are:

- The base year (2019) cost per typical single family wastewater user in Kearny was calculated to be $499 based on a monthly water consumption of 4,500 gallons. Based on a 2019 median household income of $61,400 this works out to a RI of 0.8%.
- The costs per typical single family user in Kearny is projected to increase to $1,258 annually in 2051 without implementing the CSO controls due to inflation. This would result in a RI of 1.1%.
- Implementing a $69.9 million Municipal Control Alternative with capital costs completed in 2050 would result in annual costs per typical single family user of $2,189 in 2051, which works out to a 2.0% RI.
- Excluding inflation, the projected cost per typical single family user with the CSO controls would be around $848 in 2051, resulting in a RI of 0.8%.
- The analysis does not reflect the current and lingering financial impacts as a result of the COVID -19 pandemic and should be revisited upon finalizing the LTCP implementation schedule.

3.3 Underlying Assumptions

Key assumptions used in the above analysis are summarized on Table 3-5. An annotated complete list of all data and assumptions used in the affordability model is provided as an appendix to this memorandum.

Table 3-5 – Affordability Model Key Inputs and Assumptions

Item	Value	Notes
Finance		
Bond Term		
Market Interest Rate	6.0%	NJEIT Financing – Smart Growth program offers 75% funding at 0% interest and 25% funding at market rates for 20 years for CSO control projects.
NJDEP	0.0%	
Blended Interest Rate	1.5%	
Target Coverage	125.00%	
O&M as % of Capital Cost	1.0%	

Table 3-5 – Affordability Model Key Inputs and Assumptions

Item	Value	Notes
Economic		
LTCP O&M Inflation	4.0%	Based on national rates of wastewater system O&M costs in 2017 NACWA study.
LTCP Construction Inflation	3.7%	Based on 1984 – 2015 ENR Construction Cost Index for New York City (80%) and Philadelphia (20%).
Estimate Base Year		
MHI Data Year	2015	
Typical Household Monthly Consumption	4,500	Typical urban water consumption.

4.0 Analysis of Financial Capability Indictors

The second part of the financial capability assessment - calculation of the financial capability indicator for the permittee - includes six items that fall into three general categories of debt, socioeconomic, and financial management indicators. The six items are:

- Bond rating
- Total net debt as a percentage of full market real estate value
- Unemployment rate
- Median household income
- Property tax revenues as a percentage of full market property value
- Property tax revenue collection rate

Each item is given a score of three, two, or one, corresponding to ratings of strong, mid-range, or weak, according to EPA-suggested standards. The overall financial capability indicator is then derived by taking a simple average of the ratings. This value is then entered into the financial capability matrix to be compared with the residential indicator for an overall capability assessment). Table 4-1 contains the six criteria and the ratings that categorize the permittee as strong, mid-range, or weak in each category. A discussion of each item follows.

Table 4-1 Permittee Financial Capability Indicator Benchmarks

Indicator	Strong (3)	Mid-Range (2)	Weak (1)
Bond Rating	AAA-A (S&P) or Aaa-A (Moody's)	BBB (S&P) or Baa (Moody's)	BB-D (S&P) of Ba-C (Moody's)
Overall Net Debt as a Percent of Full Market Property Value	Below 2%	2% to 5%	Above 5%
Unemployment Rate	More than 1% below the National Average	+/- 1% of the National Average	More than 1% above the National Average

Indicator	Strong (3)	Mid-Range (2)	Weak (1)
Median Household Income	More than 25% above National MHI	+/- 25% above National MHI	More than 25% below National MHI
Property Tax as a Percent of Full Market Property Value	Below 2%	2% to 4%	Above 4%
Property Tax Collection Rate	Above 98%	94% to 98%	Below 94%

4.1 Bond Rating – Indicator 1

Kearny's bond rating is Baa2 by Moody's as of December 2017; which is considered midrange under the USEPA criterion.

4.2 Overall Net Debt as a Percent of Full Market Value – Indicator 2

Debt Burden is measured by overall net debt as a percent of full market property value, which evaluates the ability of local government to issue additional debt. For this analysis, the three year average property valuation is used. Overall Net Debt is defined as current total liability to be repaid by property taxes divided by the municipality's full market property value. This indicator is relevant as a metric for municipalities issuing general obligation bonds which are substantially repaid through property tax revenues.

The Kearny net debt in 2017 totaled $50.5 million.[9] The percent of total net debt to the three year valuation of $3.4 billion was 1.54%, placing Kearny in the strong range for this measure.

4.3 Unemployment Rate – Indicator 3

The unemployment rate is used as an assessment of the economic well-being of residential users in the service area. The U.S. EPA Guidance criteria for unemployment are described in Table 5-1, Unemployment Indicator Criteria.

The dataset for the municipal unemployment rates is taken from the US Census American Community Survey 2013-2017 estimates. The American Community Survey gathers data over a 5-year period. The prevailing unemployment rate provided by the ACS for that timeframe more closely represents the actual strength of the economy in a municipality. The unemployment rate for Kearny for the period was 7.7% percent. This is higher than the national rate of 6.6% for the same time period. Under the EPA metrics, an unemployment rate greater than one percent of the national value is considered to be weak. It should also be noted that the above statistics are for Kearny and should not be confused with Bureau of Labor Statistics data for the New York – Newark SMSA.

4.4 Median Household Income – Indicator 4

Median Household Income (MHI) divides the relevant incomes of a population into two parts so that half of the incomes are below the median and half of the incomes are above the median. Unlike average income, median income is not skewed by extremely high or extremely low

[9] Source: 2017 NJDCA User Friendly Budget for Kearny – Sheet UFB-10

incomes in the dataset. Table 4-2 shows that the Kearny MHI was 10% higher than the national a weak rating per the EPA metric. Being within 25% of the national MHI, it is considered mid-range.

Table 4-2 Median Household Income

	Median Household Income[10]
Kearny	$63,300
United States	$57,650
% Difference	+10%
Categorization	Midrange

4.5 Property Tax Revenues as a % of Full Market Value – Indicator 5

The three year average valuation for the taxable property in Kearny was $3.4 billion. Total taxes of $112.5 million were levied by all jurisdictions. Therefore, the property tax levy is approximately 3.3% of the three-year average equalization value provided on the municipal information sheet; resulting in a midrange rating per the USEPA metric.

4.6 Property Tax Collection Rate – Indicator 6

Kearny's rate was reported at 97.8%, which places it in the midrange for real estate tax collections.

4.7 Financial Indicator Score

As shown on Table 4-3, the overall score for the financial indicators is 2.0, yielding an EPA Qualitative Score of midrange. This calculation is based on the use of all six of indicators.

Table 4-3 – Permittee Financial Capability Indicator Benchmarks

Indicator	Rating	Numeric Score
Bond Rating	Midrange	2
Overall Net Debt as a Percent of Full Market Property Value	Strong	3
Unemployment Rate	Week	1
Median Household Income	Midrange	2
Property Tax as a Percent of Full Market Property Value	Midrange	2
Property Tax Collection Rate	Midrange	2
	Total	13
Overall Indicator Score: (numeric score / number of applicable indicators)		2.0
	EPA Qualitative Score	Midrange

[10] Source: US Census – National Community Survey estimates for 2013 - 2017

5.0 Financial Capability Matrix

In this section the results of the step 1 affordability analysis which goes towards the residential ratepayers' ability to afford CSO controls within the context of other capital investment needs is integrated with the step 2 (Financial Capability) analysis which goes towards the permittee's ability to finance the implementation of the LTCP.

It was established previously that capital expenditures for the Kearny Municipal Control Alternative of approximately $69.9 million over a thirty-year implementation period would result in a Residential Indicator of 2.0% assuming that there are no incremental operation and maintenance costs. This RI is at the low end of what is considered to be a high burden under the EPA framework.

The overall Kearny financial capability rating considered to be midrange under the EPA framework. The intersection of these two ratings on the EPA financial capability matrix places the Kearny sewer system in the category of medium financial burden, as shown on Table 5-1.

Table 5.1 The Financial Capability Matrix - (Shaded areas Indicate Kearny's Ratings)

Permittee Financial Capability Indicators Score	Residential Indicator		
(Socioeconomic, Debt and Financial Indicators)	Low (Below 1.0%)	Mid-Range (Between 1.0 and 2.0%)	High (Above 2.0%)
Weak (Below 1.5)	Medium Burden	High Burden	High Burden
Mid-Range (Between 1.5 and 2.5)	Low Burden	Medium Burden	**High Burden**
Strong (Above 2.5)	Low Burden	Low Burden	Medium Burden

6.0 Additional Economic Factors

In addition to following EPA guidelines for completion of the financial capability assessment matrix, a discussion of socioeconomic trends in the Kearny sewer system area is essential to the consideration of scheduling and compliance levels with CSO guidelines.

6.1 Cost of Living Factors

6.1.1 Cost of Living Index

Specific cost of living comparisons of Kearny and national averages are not available. However, the cost of living for the Cities of Elizabeth and Newark is approximately 30% higher than the

national average.[11] Using this value as a proxy, households in Kearny face costs of living that are about 30% higher than the national average while earning an income that is about 10% higher than the national median income. Put another way, adjusting for the cost of living, the effective MHI in Kearny is about 85% of the national MHI.

6.1.2 Housing Costs

One of the major drivers in the higher cost of living in Kearny is the cost of housing. Housing costs in Kearny are approximately 169%[12] of the national average. The Residential Indicator is a national screening parameter and does not account for localized factors which erode the effective household income. Based upon a 2017 study[13] by the National Low Income Housing Coalition, the fair market value of a two bedroom apartment in Hudson County was $1,519 per month which works out to 29% of the Kearny median household income.

6.1.3 Local Tax Burdens

The property tax burdens within the combined sewered municipalities of the PVSC service area are substantial. The average residential tax for 2017 in Kearny was $10,171. This includes Kearny municipal purpose taxes of $3,754 along with Hudson County and school district taxes.[14] This compares with a national average local property tax levy of $3,500 for a similarly priced home. Moreover, as housing prices are higher in the New York – Newark metropolitan area than nationally, houses costing well over the national median value of $193,500 are purchased by families of modest incomes.

The high housing costs and tax burdens facing Kearny households reduces their effective household income. Consequently, measuring the household burden imposed by wastewater costs as a percentage of the median household income may underestimate the financial burden of the projected wastewater costs per household. As was noted in an analysis of the impacts of CSO controls in the Boston region:

> *"The greater are the costs of other necessities as a share of MHI, the greater will be the economic burden associated with sewer charges equal to a given percent of MHI."* [15]

6.2 Poverty Factors

6.2.1 Poverty Rate

In 2017, 11.7% of the population in Kearny was living below the poverty line. This compares to the national average poverty rate of 14.6%.

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[11] http://www.infloplease.com/business/economy/cost of living - index.us-cities html

[12] Using the Newark – Elizabeth cost of living indices.

[13] Out of Reach 2017 – The High Cost of Housing National Low Income Housing Coalition.

[14] Source: 2017 NJDCA User Friendly Budget sheet UFB-1

[15] Assessment of the Economic Impact of Additional Combined Sewer Overflow Controls in the Massachusetts Water Resource Authority Service Area (page 13) prepared by Robert N. Stavins, Genia Long, and Judson Jaffee. Analysis Group Incorporated, August 2004.

6.2.2 Household Income Brackets – Impact of the CSO Control Program

When the Residential Indicator is 2.0% of median household income, by definition half of the households in Kearny would be paying more than 2.0% of their household incomes for wastewater services. In areas with large percentages of low income households or low effective household incomes, the burden of a 2.0% RI for the municipal median household income can be severe. As shown on Table 6-1, around 5,300 households would be paying 3.0% or more of their income bracket average household incomes for wastewater services.

Table 6-1 – Impact of the Municipal Control Alternative on the Residential Indicator

Income Bracket	Households		Estimated Population		RI Resulting from $70 Million in Capital Expenditures Through 2050	Bracket Average Income
	Number	Cumulative	Number	Cumulative		
Less than $10,000	671	671	2,116	2,116	25.39%	$5,000
$10,000 to $14,999	381	1,052	1,201	3,317	10.15%	$12,500
$15,000 to $24,999	1,230	2,282	3,879	7,196	6.35%	$20,000
$25,000 to $34,999	962	3,244	3,034	10,230	4.23%	$30,000
$35,000 to $49,999	2,011	5,255	6,342	16,572	2.99%	$42,500
$50,000 to $74,999	2,720	7,975	8,577	25,149	2.03%	$62,500
$75,000 to $99,999	1,810	9,785	5,708	30,857	1.45%	$87,500
$100,000 to $149,999	2,196	11,981	6,925	37,782	1.02%	$125,000
$150,000 to $199,999	1,025	13,006	3,232	41,014	0.73%	$175,000
$200,000 or more	467	13,473	1,473	42,487	0.63%	$200,000
Total	13,473		42,487			

6.2.2 Income Growth Trends

The Kearny MHI growth between 2000 and 2017 was about 1.7% annually. This growth rate compares with the growth rates for New Jersey (2.20%) and for the U.S. (2.14%).

6.2.3 New Jersey Department of Community Affairs Municipal Revitalization Index

New Jersey's Municipal Renewal Index[6-16] measures the social, economic, physical and financial conditions of the 565 municipalities within New Jersey. The MRI is compiled by the NJ Department of Community Affairs and is used in the distribution of needs based funding. Six primary along with four secondary criteria are used:

[6-16] Measuring Distress in New Jersey: the 2017 Municipal Revitalization Index Office of Policy and Regulatory Affairs, New Jersey Department of Community Affairs.

Primary Criteria

- Children on TANF (Temporary Assistance for Needy Families) per 1,000 persons
- Unemployment Rate
- Poverty Rate
- High school diploma or higher
- Median Household Income
- Percent of households receiving SNAP (food stamps)

Secondary Criteria

- Ten year rate of change in population
- Non-seasonal housing vacancy rate
- Equalized three year effective property tax rate
- Equalized property valuation per capita

The 2017 state-wide MRI rankings for the combined sewered municipalities within the PVSC service area are shown on Table 6-2. Kearny has a ranking of 106th most distressed municipality out of 565.

Table 6-2 – Municipal Renewal Index for the PVSC Combined Sewered Municipalities

Municipality	2017 Municipal Revitalization Index			Percentile of Least Resourced Municipalities
	MRI Score	MRI Distress Score	MRI Rank	
Bayonne	-4.56	40.2	82	15%
East Newark	-5.71	43.4	65	12%
Guttenberg	-5.12	41.8	70	12%
Harrison	-4.49	40.0	87	15%
Jersey City	-5.80	43.7	64	11%
Kearny	-3.67	37.7	106	19%
Newark	-16.53	73.5	12	2%
North Bergen	-4.65	40.5	80	14%
Paterson	-19.43	81.6	8	1%

6.3 Implications of the Additional Economic Factors

The additional economic factors presented above were intended to provide additional context to the affordability and financial capability scores determined in this initial FCA. The context of

this FCA and of the implementation of the LTCP is a combined sewered community with effective household incomes well below the federal and state levels, high poverty rates, and high local tax burdens. Kearny is and is likely to remain financially distressed due to structural economic factors beyond its direct control and its ability to afford and finance future CSO control facilities is restricted.

7.0 Potential Impacts of the COVID-19 Pandemic on Affordability

The projections and conclusions concerning the affordability of the Municipal Control Alternative proposed in this SIAR by Kearny and Kearny's financial capability to finance the CSO control program are premised on the baseline financial conditions of Kearny as well as the economic conditions in New Jersey and the United States generally at the time that work on this SIAR commenced. While the impacts of the pandemic on the long-term affordability of the CSO LTCP are obviously still unknown, it is reasonable to expect that there will be impacts, potentially significant impacts. There are several dimensions to these potential impacts, including both potentially reduced utility revenues, and potentially reduced household incomes.

7.1 Potential Wastewater Utility Revenue Impacts

This Financial Capability Assessment cannot reflect the currently unknowable impacts on wastewater utility revenues stemming from the national economic upheaval resulting from the COVID-19 pandemic. It is however extremely likely that Kearny and municipal wastewater utilities in general across the United States will face significant and potentially permanent declines in revenues from households unable to pay their water and sewer bills and the sudden decline in industrial and commercial demands for potable water and wastewater treatment.

On March 20, 2020 the National Association of Clean Water Agencies (NACWA) issued a press release stating that:

> **"NACWA conservatively estimates the impact to clean water utilities nationwide of lost revenues due to coronavirus at $12.5 Billion.** This is a low-end estimate, assuming an average loss of revenue of 20% which is well within the range of what individual utilities are already projecting. Some utilities are anticipating closer to a 30% or 40% loss in revenue. This estimate is based on the substantial historical utility financial data NACWA has on file through its Financial Survey and recent reports from NACWA members on the decrease in usage they are observing in their systems over the last few weeks."[17]

The impact of a 20% to 40% revenue loss, along with increased costs that have been and will continue to be experienced by water and wastewater utilities such as overtime and the writing off of customer accounts receivable could have a profound impact on the affordability of the proposed CSO controls and Kearny's ability to finance them.

Most of the costs of a municipal wastewater system are relatively fixed within broad operating ranges. Debt service and other capital costs are fixed once incurred. Some operating costs are

[17] NACWA press release: Coronavirus Impacting Clean Water Agencies; Local Utilities and Ratepayers Need Assistance March 20, 2020

somewhat variable with wastewater flows, e.g. chemical and electrical power usage but this variability is lessened by the reality that inflow, infiltration and stormwater flow in a combined system are not affected by billed water consumption. Labor costs are not directly variable, e.g. a twenty percent reduction in billed flow would not result in a need for twenty percent less labor. Maintenance costs might go down somewhat as equipment operating times may be reduced.

As costs do not decline proportionately to billed flow, it can be expected that user charge rates must be raised to generate sufficient revenue to sustain current operations. The relationship between changes in costs and revenues and the resultant changes in user charge rates is complex and has not yet been fully analyzed. At this point it can be assumed that user rate increases may be necessary to simply maintain current operations, and these rate increases will likely erode the financial capability of Kearny to fund the CSO LTCP.

7.2 Potential Median Household Income Impacts

The impacts of the pandemic on median household incomes in Kearny cannot be determined at this point. Historical analogies may provide some useful, albeit disturbing, context but are not presented as predictive:

- U.S. median household income fell by 6.2% from $53,000 in 2007 to $49,000 in 2010. In New Jersey, the MHI decreased by around 4.0% for the same period.[18]
- The U.S. unemployment rates rose from 5.0% in December of 2007 to 9.9% in December of 2009.[19]
- Data on impacts of the Great Depression on median household income are not available. As a proxy, the personal income per capita data are available. For 1929 this was $700. By 1933 this figure bottomed out at $376, a decline of 46%. Unemployment for the same period rose from around 3.0% to 25%.[20]

While a quantifiable assessment of the impact of the pandemic on median household income is not feasible at this time, reduction in base year MHI can be expected. This will further exacerbate the impacts of the revenue reductions described above on LTCP affordability, as higher base user charge rates will absorb an increased portion of lower MHI.

7.3 Implications for the Long Term CSO Control Program

Kearny anticipates that the financial implications of the COVID-19 pandemic will be discussed with NJDEP during the review of the SIAR and as the 2021 – 2025 NJPDES permit is developed. Based on the October 1, 2020 revised due date for the SAIR, additional revenue data should be available to support a more specific refinement of this analysis in the SIAR.

Given the current and likely continuing uncertainties as to the New Jersey and national economic conditions, Kearny will be reticent to commit to long term capital expenditures for CSO controls without the incorporation of adaptive management provisions, including

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18 Source: Fact Sheet: Income and Poverty Across the States, 2010 Joint Economic Committee, United States Congress, Senator Robert P. Casey, Jr. Chairman.

19 Source: Bureau of Labor Statistics data series LNS1400000

20 Source: Federal Reserve Economic Data (FRED) data series: A792RC0A052NBEA

provisions to revise and reschedule the long term CSO controls proposed in this SIAR based on emergent economic conditions beyond the Kearny's control. These provisions could include scheduling the implementation of specific CSO control measures to occur during the five year NJPDES permit cycles. A revised affordability assessment should occur be performed during review of the next NJPDES permit to identify controls that are financially feasible during that next permit period.

8.0 Conclusion

The 1997 EPA guidance indicates that ratepayers and municipalities who are highly burdened future expenditures added to their current wastewater treatment, conveyance, and collection costs can be allowed 15 years to complete capital projects to handle CSOs. In extreme cases, the guidance suggested a 20-year compliance schedule might be negotiated.[21] Kearny is proposing a 30-year implementation schedule.

The affordability analysis detailed above has documented that the selected $69.9 million (current dollars) Municipal Control Alternative along with related operation and maintenance costs would result in a Residential Indicator of "high impact" under EPA's criteria. Moreover, the reality of the low effective household incomes compared to the rest of the US and the high costs of living in Kearny argue strongly that the EPA metric understates the impacts of the CSO control costs on the residents of the City. As evidenced by its New Jersey Municipal Revitalization Index score in the top 81st percentile Kearny's capacity for additional CSO controls beyond those proposed in the SIAR is limited.

[21] Combined Sewer Overflows – Guidance for Financial Capability Assessment and Schedule Development, EPA 832-B-97-004, Page 46.

Memorandum

To: *City of Newark*

Copy: *Thomas Laustsen, Sheldon Lipke, Mike Hope, Tim Dupuis, Scott Craig*

From: *Tom Schevtchuk*

Date: *September 26, 2020*

Subject: *Final Financial Capability Assessment for the City of Newark*

1.0 Executive Summary

Projected Impacts of CSO Controls at a Glance	
Baseline: Typical Household 2019	
Annual Wastewater Costs	$340
Residential Indicator (RI)*	1.0%
Median Household Income (MHI)	$35,600
LTCP Control Options	
Capital Costs in million current $	$450.1
First Year After Fully Implemented	2031
LTCP Impact on Typical Household Cost in:	2031
Projected Median Household Income	$40,700
Annual Costs Without the LTCP	$476
Annual Costs With the LTCP	$723
Residential Indicator	
Without the LTCP	1.2%
With the LTCP	1.8%

This Financial Capability Analysis (FCA) memorandum is in support of the Municipal Control Alternative identified in the Selection and Implementation of Alternatives (SIAR) developed by the City of Newark. It quantifies the projected affordability impacts of Newark's proposed long term CSO controls for the Newark combined sewer system (CSS) and updates the 2019 preliminary FCA memo that was intended to guide the development and selection of long term controls.

As summarized in Table E-1, this FCA includes the projected impacts if the CSO controls are undertaken by Newark alone (Municipal Control Alternative) based on the costs and implementation schedule included in Newark's SIAR Section F.

While a regional alternative would result in lowered overall costs for the control of CSOs within the PVSC service area, the basis of this allocation remains under discussion as of the writing of this memorandum. Under this approach both the costs of the regional facilities such as a relief interceptor and the resultant savings would be allocated amongst the PVSC municipalities with combined sewer systems. As the basis of this allocation remains under discussion as of the writing of this SIAR, this FCA memorandum focuses on implementation of the Municipal Control Alternative. Should the permittees come to agreement on the cost allocation for the Regional Control Plan, the FCA will be revisited to reassess the affordability and schedule for implementation of the LTCP.

The Financial Capability assessment is a two-step process including ***Affordability*** which evaluates the impact of the Municipal Control Alternative on the residential ratepayers and ***Financial Capability*** which examines a permittee's ability to finance the program. Affordability is measured in terms of the Residential Indicator (RI) which is the percentage of median household income spent on wastewater services. Total wastewater services exceeding

2.0% of the median household income are considered to impose a high burden by USEPA. The financial capability analysis uses metrics similar to the municipal bond rating agencies.

The 2019 preliminary FCA determined that future capital expenditures for CSO controls and all other capital expenditures of approximately $320 million (current dollars) over a twenty-year period (2022 through 2041) would result in a RI exceeding 2.0% using a dynamic (time sensitive) model which accounts for future inflation. Along with the calculated debt service costs associated with the $320 million in capital costs an annual incremental operations and maintenance (O&M) cost of $3.20 million or 1.0% of the capital cost value was estimated. The currently projected incremental O&M costs of $1.0 million for the Newark based controls and $480,000 estimated O&M account for the difference in results from the 2019 preliminary analysis.

Newark's SIAR projects future capital costs for CSO control totaling approximately $450 million (current dollars) through 2030 and incremental annual O&M costs of $1.0 million under the Newark Municipal Control Alternative detailed in the SIAR. This would result in a projected residential indicator in 2031, the first year after full implementation of the controls of 1.9% which while constituting a medium burden under the USEPA analytical guidelines is close to the 2.0% threshold for "high burden".

The second step of the financial capability analysis documents that Newark's current financial capability strength is "mid-range". These two metrics combine on EPA's Financial Capability Matrix to indicate a medium burden under the USEPA guidance when the $450 million in capital expenditures is assumed.

This draft memorandum is based on information provided by Newark, PVSC and external sources such as the on-line fiscal reports available through the New Jersey Department of Community Affairs.[1]

The projections and conclusions concerning the affordability of the Municipal Control Alternative proposed in this SIAR by the City of Newark and Newark's financial capability to finance the Municipal Control Alternative are premised on the baseline financial conditions of Newark as well as the economic conditions in New Jersey and the United States generally at the time that work on this SIAR commenced. While the impacts of the pandemic on the long-term affordability of the CSO LTCP are obviously still unknown, it is reasonable to expect that there will be potentially significant impacts. There are several dimensions to these potential impacts, including reduced utility revenues and household incomes.

2.0 Introduction

2.1 Intent of the Financial Capability Analysis

This document presents the final Financial Capability Analysis (FCA) relating to the development of the CSO Long Term Control Plan (LTCP) required under Paragraph G(8)(a) of the Combined Sewer Management section of a permittee's NJPDES discharge permit. The assessment is based upon the EPA document "Combined Sewer Overflows – Guidance for

[1] https://www.nj.gov/dca/divisions/dlgs/resources/fiscal_rpts.shtml

Financial Capability Assessment and Schedule development," (EPA Guidance Document) published February 1997[2], as supplemented by EPA's November 2014 memorandum entitled "Financial Capability Assessment Framework for Municipal Clean Water Act Requirements".[3] A preliminary FCA memorandum was provided by PVSC to Newark and the other combined sewered permittees within its service area in August of 2019, with a subsequent update in December of 2019.

This final FCA and last year's preliminary versions support the twofold purposes of the FCA as envisioned in the 1994 CSO Control Policy[4] (Policy). First, the FCA is intended to identify the upper limits of what could constitute an affordable future investment strategy as defined by the Policy and related guidance documents under an assumed LTCP implementation schedule; thereby informing the development of CSO, SSO, MS4, TMDL, and other necessary control alternatives. Second, the financial and user cost (affordability) impacts of the selected CSO controls must be assessed to support the development of a workable implementation schedule for the LTCP.[5]

2.2 EPA's Two Step Analysis Process

The Financial Capability assessment is a two phased process. The residential indicator (RI) is the percentage of median household income (MHI) expended on wastewater (including stormwater) management. The upper limit of affordability for wastewater services within the Newark will be the point where total wastewater management costs for the typical residential user in Newark exceed 2.0% of the Median Household Income (MHI). This metric of total wastewater management costs as a percentage of MHI is termed the Residential Indicator (RI) by USEPA.

The financial capability indicator is an assessment of the permittee's debt burden, socioeconomic conditions, and financial operations. These two measures are subsequently entered into a *financial capability matrix*, suggested by EPA, to determine the level of financial burden placed on residential customers and the permittee by the existing and projected future expenditures to operate, maintain, and enhance the wastewater management system. The EPA matrix appears in Table 5.1 of this document.

The projected future expenditures driving the RI and imposing demands upon the financial capability of Newark will include the implementation of CSO controls, stormwater controls, conveyance / collection system rehabilitation, in addition to the current debt service and other

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2 EPA 832-B-97-004

3 November 24, 2014 memorandum from Ken Kopocis, Deputy Assistant Administrator, Office of Water (OW) and Cynthia Giles, Assistant Administrator, Office of Enforcement and Compliance (OECA) to Regional Administrators

4 Combined Sewer Overflow Policy Section II-C(8) 59 FR 18694

5 "Schedules for implementation of the long-term CSO control plan may be phased based on the relative importance of adverse impacts upon water quality standards and designated uses, and on a permittee's financial capability." (59 FR 18688)

operational, maintenance, and planned capital improvements to the Newark sewer system that have been identified and provided by the City for inclusion into this analysis.

2.3 Limitations to the EPA Analytical Framework

EPA's 1997 financial capability guidance calls for the use of a simplistic "snap shot" model which assumes that all future expenditures are incurred simultaneously and that costs and incomes should be based on current dollars. This approach has the advantage of eliminating the need to estimate future rates of inflation and income growth. However, this approach can understate the affordability impact of long-term programs since income growth has not kept pace with and is not projected to keep pace with water utility capital and O&M cost inflation. For example, for the period of 1999 through 2013, the national costs for typical household wastewater services increased at a rate of 4.8%.[6] The national Consumer Price Index increased at an annual rate of around 2.4%[7] for the period while the US median household income increased from around $42,000 to $52,250 at an annual rate of 1.6%.[8]

An affordability analysis that does not account for the continuing divergence between wastewater utility costs and income growth over course of a long term implementation schedule will overstate the "affordability" of the LTCP as future costs are recovered from the residential and other system users. Conversely, including current permittee expenditures or debt service payments which would end before the costs from the CSO controls are paid can understate future affordability.

EPA's November 24, 2014 memorandum encourages the use of a time-based ("dynamic" model per the memo) model to supplement the snapshot approach. PVSC has developed a time-based model that calculates annual costs and revenue requirements based on assumed program costs, schedules and economic variables such as interest and inflation rates. The residential indicator is calculated for each year based upon the costs per typical residential users which changes annually based on the annual system revenue requirements.

An additional limitation to the EPA methodology is its focus on the median household income (MHI) which therefore does not address the affordability impacts of wastewater service costs on the lower income households in Newark's or any service area. By definition, one half of the households in Newark would be paying more than 1.0% of their household income for wastewater services when the residential indicator for the MHI equals 1.0%.

Three of the six EPA financial capability metrics focus on general obligation (G.O.) bond rating criteria which are amortized through property tax or other general revenue streams:

- Overall Net Debt as a Percentage of Full Market Property Value;
- Property Tax Revenues as a Percent of Full Market Property Value; and
- Property Tax Revenue Collection Rate.

6 NACWA 2013 Cost of Clean Water Index

7 US Bureau of Labor Statistics

8 US Census

The assumption that G.O. bonds will be used would not be appropriate for financing by municipal authorities.

For this analysis only, it is assumed that financing through the New Jersey Environmental Finance Program will be used as necessary to meet projected construction draw requirements. The actual size and timing of financing necessary to implement the CSO controls will be determined by the eventual construction schedules for the various components of the CSO Controls and other wastewater capital improvement needs and are therefore beyond the scope of this document.

In addition to following guidelines for the affordability and financial capability metrics, EPA encourages inclusion of any information that would have a financial impact on the permittee in the capability report. This assessment, therefore, includes additional discussion of socioeconomic trends in Newark because of the financial challenges that the municipality faces.

3.0 Affordability Assessment

3.1 Baseline (2019) Wastewater Services Affordability

The Residential Indicator is an approximation of households' abilities to pay their total wastewater costs and is derived by dividing the total annual wastewater costs for the typical household within the permittee's (Newark's) service area by the median household income within the service area. The Residential Indicator is compared to EPA-defined criteria to determine whether total annual wastewater costs impose a low, mid-range, or high impact on residential users. Table 3-1 shows U.S. EPA's Residential Indicator criteria, which define a "low" impact as a cost per household (CPH) less than 1.0% median household income (MHI), a "mid-range" impact between 1.0 and 2.0%, and "high" impact as greater than 2.0% of MHI.

Table 3-1. EPA Residential Indicator

Residential Indicator	Cost per Household
Low Burden	Less than 1.0 percent of MHI
Mid-Range Burden	1.0-2.0 percent of MHI
High Burden	Greater than 2.0 percent of MHI

The estimated annual cost for wastewater services for a typical single-family residential user for 2019 is $340. This estimate is based on typical residential potable water usage is 4,500 gallons monthly. Based on the estimated MHI of $35,600 the Residential Indicator is approximately 1.0%, or at the border between what the EPA guidance defines as a low burden and a medium burden. By definition the current residential indicator for one half of the households is greater than the 1.0%.

In Newark, 28.3% of the population was living below the poverty line. The total Census households are broken out by income brackets on Table 3-2 below, along with the respective current Residential Indicators by income bracket. The RI for each bracket was calculated from

the mid-point income within the bracket. At the lowest income levels, the current RI is already between 2.7% and 6.8%.

Table 3-2. Analysis of the Current Residential Indicator

Income Bracket	Households		Bracket Average Income	Bracket RI at Typical Cost per Household
	Number	Cumulative		
Less than $10,000	14,841	14,841	$5,000	6.80%
$10,000 to $14,999	7,790	22,631	$12,500	2.72%
$15,000 to $24,999	13,900	36,531	$20,000	1.70%
$25,000 to $34,999	11,283	47,814	$30,000	1.13%
$35,000 to $49,999	13,618	61,432	$42,500	0.80%
$50,000 to $74,999	14,743	76,175	$62,500	0.54%
$75,000 to $99,999	7,855	84,030	$87,500	0.39%
$100,000 to $149,999	7,600	91,630	$125,000	0.27%
$150,000 to $199,999	2,136	93,766	$175,000	0.19%
$200,000 or more	1,550	95,316	$200,000	0.17%
Total	95,316			

3.2 Affordability Impacts of the Selected CSO Control Alternatives

Newark has identified a long term CSO control strategy that will achieve 85% capture of wet weather flows during the typical year. These controls are summarized on Table 3-3.

Table 3-3 – Newark's Selected CSO Controls

Wet Weather Control Types	Estimated Costs (in millions)	
	Capital Costs	Incremental O&M
Storage Tank at NE022, 4 OF/yr (MG)	$57.00	$0.12
Storage Tank at NE009 & NE010, 12 OF/yr (MG)	$195.10	$0.24
Storage Tank at NE014, 12 OF/yr (MG)	$106.20	$0.17
Green Infrastructure (ac)	$90.30	$0.48
Total	***$448.6***	***$1.01***

Implementation of the $449 million Newark Municipal Control Alternative results in a estimated annual costs per typical residential user of $861 and a residential indicator of 1.9% in 2031, as shown in Table 3-4.

Table 3-4 – Newark Projected Residential Indicator Upon Full Implementation of the Municipal Control Alternative

Metric	Baseline (2019)	Cost per Typical Residential Wastewater User in 2031			
		No LTCP		Municipal Control Alternative	
		With Inflation	Without Inflation	With Inflation	Without Inflation
RI	1.0%	1.2%	1.0%	1.8%	1.2%
Annual $	$340	$476	$340	$723	$515

Key points from Table 3-4 are:

- The base year (2019) cost per typical single family wastewater user in Newark was calculated to be $340 based on a monthly water consumption of 4,500 gallons. Based on a 2019 median household income of $35,600 this works out to a RI of 1.0%.
- The costs per typical single family user in 2031 is projected to increase to $476 annually without implementing the CSO controls due to inflation. This would represent a RI of 1.2% assuming income growth at a rate of 1.4%.
- Implementing a $449 million Municipal Control Alternative with capital costs completed in 2030 years would result in annual costs per typical single family user of $723 in 2031, which works out to a 1.8% RI.
- Excluding inflation, the projected cost per typical single family user with the CSO controls would be around $515 in 2031, a RI of 1.2%.
- The analysis does not reflect the current and lingering financial impacts as a result of the COVID -19 pandemic and should be revisited upon finalizing the LTCP implementation schedule.

3.3 Underlying Assumptions

Key assumptions used in the above analysis are summarized on Table 3-5. An annotated complete list of all data and assumptions used in the affordability model is provided as an appendix to this memorandum.

Table 3-5 – Affordability Model Key Inputs and Assumptions

Item	Value	Notes
Finance		
Bond Term		
Market Interest Rate	6.0%	NJEIT Financing – Smart Growth program offers 75% funding at 0% interest and 25% funding at market rates for 20 years for CSO control projects.
NJDEP	0.0%	
Blended Interest Rate	1.5%	
Target Coverage	125.00%	
O&M as % of Capital Cost	1.0%	

Table 3-5 – Affordability Model Key Inputs and Assumptions

Item	Value	Notes
Economic		
LTCP O&M Inflation	4.0%	Based on national rates of wastewater system O&M costs in 2017 NACWA study.
LTCP Construction Inflation	3.7%	Based on 1984 – 2015 ENR Construction Cost Index for New York City (80%) and Philadelphia (20%).
Estimate Base Year		
MHI Data Year	2015	
Typical Household Monthly Consumption	4,500	Typical urban water consumption.
Demographic		
Newark Residential Connections		Municipal account data
Newark MHI	$34,800	American Community Survey Five Year Estimate 2013 – 2017 (inflated by Census to 2017)
Residential Share of Billed Water Consumption		Municipal account data.

4.0 Analysis of Financial Capability Indicators

The second part of the financial capability assessment - calculation of the financial capability indicator for the permittee - includes six items that fall into three general categories of debt, socioeconomic, and financial management indicators. The six items are:

- Bond rating
- Total net debt as a percentage of full market real estate value
- Unemployment rate
- Median household income
- Property tax revenues as a percentage of full market property value
- Property tax revenue collection rate

Each item is given a score of three, two, or one, corresponding to ratings of strong, mid-range, or weak, according to EPA-suggested standards. The overall financial capability indicator is then derived by taking a simple average of the ratings. This value is then entered into the financial capability matrix to be compared with the residential indicator for an overall capability assessment). Table 4-1 contains the six criteria and the ratings that categorize the permittee as strong, mid-range, or weak in each category. A discussion of each item follows.

Table 4-1 Permittee Financial Capability Indicator Benchmarks

Indicator	Strong (3)	Mid-Range (2)	Weak (1)
Bond Rating	AAA-A (S&P) or Aaa-A (Moody's)	BBB (S&P) or Baa (Moody's)	BB-D (S&P) of Ba-C (Moody's)
Overall Net Debt as a Percent of Full Market Property Value	Below 2%	2% to 5%	Above 5%
Unemployment Rate	More than 1% below the National Average	+/- 1% of the National Average	More than 1% above the National Average
Median Household Income	More than 25% above National MHI	+/- 25% above National MHI	More than 25% below National MHI
Property Tax as a Percent of Full Market Property Value	Below 2%	2% to 4%	Above 4%
Property Tax Collection Rate	Above 98%	94% to 98%	Below 94%

4.1 Bond Rating – Indicator 1

Newark's bond rating as of 2017 was Baa3 (Moody's Investors Services) and AA- (Standard & Poors). These ratings are considered midrange under the EPA guidance.

4.2 Overall Net Debt as a Percent of Full Market Value – Indicator 2

Debt Burden is measured by overall net debt as a percent of full market property value, which evaluates the ability of local government to issue additional debt. For this analysis, the three year average property valuation ($13.4 billion) provided in the NJDCA User Friendly Budget (UFB-10) is used. Overall Net Debt is defined as current total liability to be repaid by property taxes divided by the municipality's full market property value. This indicator is relevant as a metric for municipalities issuing general obligation bonds which are substantially repaid through property tax revenues.

Overall net debt includes overlapping debt, which is the indebtedness of Newark, the School District of Newark and that of Essex County. The Newark General Bonded Debt totaled $231 million.[9] The percent of total net debt to full market value was 2.08%. Overall net debt as a percent of full market property value places Newark in the midrange on this measure.

4.3 Unemployment Rate – Indicator 3

The unemployment rate is used as an assessment of the economic well-being of residential users in the service area. The dataset for the municipal unemployment rates is taken from the US Census American Community Survey 2013-2017 estimates. The American Community Survey gathers data over a 5-year period.

9 Source: 2017 NJDCA User Friendly Budget – Sheet UFB-10.

The prevailing unemployment rate provided by the ACS for that timeframe more closely represents the actual strength of the economy in a municipality. The 2013 – 2017 ACS unemployment rate for Newark was 9.2% compared to the national rate of 6.6% for the same time period. The "weak" rating is triggered in the EPA table when the local unemployment rate is one percent above the national average. It should be noted that the above statistics are for Newark and should not be confused with Bureau of Labor Statistics data for the New York – Newark SMSA.

4.4 Median Household Income – Indicator 4

Median Household Income (MHI) divides the relevant incomes of a population into two parts so that half of the incomes are below the median and half of the incomes are above the median. Unlike average income, median income is not skewed by extremely high or extremely low incomes in the dataset. Table 4-2 shows that the MHI within Newark is significantly lower than the national average, resulting in a weak rating per the EPA metric.

Table 4-2 Median Household Income

	Median Household Income[10]
Newark	$34,800
United States	$57,650
% Difference	-40%
Categorization	Weak

4.5 Property Tax Revenues as a % of Full Market Value – Indicator 5

The three-year equalized value of taxable property in Newark is $13.5 billion based on the 2017 User Friendly Budget. Total property taxes from all jurisdictions were $421 million Therefore, the property tax levy is approximately 3.1% of the three-year average equalization value provided on the municipal information sheet; which is considered as midrange under the EPA criteria. The EPA financial capability assessment makes no provision for measuring a local tax burden other than the real estate tax. This gives Newark an artificially higher rating in the property tax revenues as a percent of full market value category, as Newark is the only municipality within New Jersey with a local income tax.

4.6 Property Tax Collection Rate – Indicator 6

The EPA criterion for a strong rating in this category is a collection rate of more than 98%. Newark's rate is estimated to be 99.2%, which places it in the strong range for real estate tax collections.

4.7 Financial Indicator Score

As shown on Table 4-3, the overall score for the financial indicators is 2.0 yielding an EPA Qualitative Score of "midrange". This calculation is based on the use of six of the six indicators that are applicable to Newark. As indicated in the text above, each of the financial indicators are

[10] Source: US Census – National Community Survey estimates for 2013 - 2017

generally based upon publicly available data from 2019 or earlier. As a result, this analysis does not reflect the impacts to each indicator as a result of the COVID -19 pandemic.

Table 4-3 – Permittee Financial Capability Indicator Benchmarks

Indicator	Rating	Numeric Score
Bond Rating	Mid-Range	2
Overall Net Debt as a Percent of Full Market Property Value	Strong	3
Unemployment Rate	Weak	1
Median Household Income	Weak	1
Property Tax as a Percent of Full Market Property Value	Mid-Range	2
Property Tax Collection Rate	Strong	3
	Total	12
Overall Indicator Score: (numeric score / number of applicable indicators)		2.0
	EPA Qualitative Score	Mid-Range

5.0 Financial Capability Matrix

In this section the results of the step 1 affordability analysis which goes towards the residential ratepayers' ability to afford CSO controls within the context of other capital investment needs is integrated with the step 2 (Financial Capability) analysis which goes towards the permittee's ability to finance the implementation of the LTCP.

It was established previously that CSO control capital expenditures within the Newark sewer system of $449 million through 2030 period would result in a Residential Indicator at 1.8% or what the EPA metrics would consider a medium burden.

The overall Newark financial capability rating considered to be midrange under the EPA framework. The intersection of these two ratings on the EPA financial capability matrix places the Newark sewer system in the category of medium financial burden, as shown on Table 5-1.

Table 5-1 – The Financial Capability Matrix - (Shaded areas Indicate Newark's Ratings)

Permittee Financial Capability Indicators Score	Residential Indicator		
(Socioeconomic, Debt and Financial Indicators)	Low (Below 1.0%)	Mid-Range (Between 1.0 and 2.0%)	High (Above 2.0%)
Weak (Below 1.5)	Medium Burden	High Burden	High Burden
Mid-Range (Between 1.5 and 2.5)	Low Burden	**Medium Burden**	**High Burden**
Strong (Above 2.5)	Low Burden	Low Burden	Medium Burden

6.0 Additional Economic Factors

In addition to following EPA guidelines for completion of the financial capability assessment matrix, a discussion of socioeconomic trends in the Newark sewer system area is essential to the consideration of scheduling and compliance levels with CSO guidelines.

6.1 Cost of Living Factors

6.1.1 Cost of Living Index

The residents of Newark face relatively high cost of living compared to other areas in the United States. A published cost of living index was used to determine the relative cost of living in Newark compared to national averages.[11] The cost of living in Newark is approximately 30% higher than the national average. The estimated U.S. median household income in 2017 was approximately $57,650 or 68% higher than the Newark MHI. Thus, the household at the median Newark household income faces costs of living that are 30% higher than the national average while earning an income that is about 60% of the national median income.

6.1.2 Housing Costs

One of the major drivers in the higher cost of living in Newark is the cost of housing. Housing costs in Newark are approximately 169% higher than the national average. The Residential Indicator is a national screening parameter and does not account for localized factors which erode the effective household income. Based upon a 2017 study[12] by the National Low Income Housing Coalition, the fair market value of a two bedroom apartment in Essex County was $1,288 per month which works out to 44% of the median household income.

6.1.3 Local Tax Burdens

The property tax burdens within the combined sewered municipalities of the PVSC service area are substantial. Based on the 2017 average residential assessment in Newark of $175,203 the average residential taxpayer impact was $6,027.[13]

At an average market value of a single-family home within Newark of $209,700 the (2017) property tax levy was about $6,900. This compares with a national average local property tax levy of $3,500 for a similarly priced home. Moreover, as housing prices are higher in the New York – Newark metropolitan area than nationally, houses costing well over the national median value of $193,500 are purchased or rented by families of modest incomes.

The high housing costs and tax burdens facing Newark households reduces their effective household income. Consequently, measuring the household burden imposed by wastewater costs as a percentage of the median household income may underestimate the financial burden of the projected wastewater costs per household. As was noted in an analysis of the impacts of CSO controls in the Boston region:

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11 http://www.infloplease.com/business/economy/cost of living - index.us-cities html

12 Out of Reach 2017 – The High Cost of Housing National Low Income Housing Coalition.

13 NJDCA 2017 User Friendly Budget – Sheet UFB-1

"The greater are the costs of other necessities as a share of MHI, the greater will be the economic burden associated with sewer charges equal to a given percent of MHI." [14]

6.2 Poverty Factors

6.2.1 Poverty Rate

In 2017 28.3% of the population in Newark was living below the poverty line. This compares to the national average poverty rate of 14.6%.

6.2.2 Household Income Brackets

When the Residential Indicator is 1.8% of median household income in 2031, by definition half of the households in Newark would be paying more than 1.8% of their household incomes for wastewater services. In areas with large percentages of low income households, the impacts of a "medium burden" 1.8% RI can be severe. As shown on Table 6-1 around 36,500 households representing a population of 108,400 would be paying around 3.2% or more of their household incomes for wastewater services, with more than 22,600 households or 67,100 residents having more than 5% of their household incomes going towards wastewater services.

Table 6-1 – Impact of a 1.9% Residential Indicator

Income Bracket	Households		Estimated Population		Control Alternative		Bracket Average Income
	Number	Cumulative	Number	Cumulative	Newark SIAR	Regional	
Less than $10,000	14,841	14,841	44,033	44,033	12.7%	$5,000	14,841
$10,000 to $14,999	7,790	22,631	23,113	67,146	5.1%	$12,500	7,790
$15,000 to $24,999	13,900	36,531	41,241	108,388	3.2%	$20,000	13,900
$25,000 to $34,999	11,283	47,814	33,477	141,864	2.1%	$30,000	11,283
$35,000 to $49,999	13,618	61,432	40,405	182,269	1.5%	$42,500	13,618
$50,000 to $74,999	14,743	76,175	43,743	226,012	1.0%	$62,500	14,743
$75,000 to $99,999	7,855	84,030	23,306	249,317	0.7%	$87,500	7,855
$100,000 to $149,999	7,600	91,630	22,549	271,867	0.5%	$125,000	7,600
$150,000 to $199,999	2,136	93,766	6,338	278,204	0.4%	$175,000	2,136
$200,000 or more	1,550	95,316	4,599	282,803	0.3%	$200,000	1,550
Total	95,316		282,803				95,316

6.2.2 Income Growth Trends

The Newark MHI growth was about 1.4% average annually 2000 to 2017. This is somewhat lower than the 1.9% growth rates for New Jersey and the U.S. for the same period.

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[14] Assessment of the Economic Impact of Additional Combined Sewer Overflow Controls in the Massachusetts Water Resource Authority Service Area (page 13) prepared by Robert N. Stavins, Genia Long, and Judson Jaffee. Analysis Group Incorporated, August 2004.

6.2.3 New Jersey Department of Community Affairs Municipal Revitalization Index

New Jersey's Municipal Renewal Index[6-15] measures the social, economic, physical and financial conditions of the 565 municipalities within New Jersey. The MRI is compiled by the NJ Department of Community Affairs and is used in the distribution of needs based funding. Six primary along with four secondary criteria are used:

Primary Criteria

- Children on TANF (Temporary Assistance for Needy Families) per 1,000 persons
- Unemployment Rate
- Poverty Rate
- High school diploma or higher
- Median Household Income
- Percent of households receiving SNAP (food stamps)

Secondary Criteria

- Ten year rate of change in population
- Non-seasonal housing vacancy rate
- Equalized three year effective property tax rate
- Equalized property valuation per capita

The 2017 state-wide MRI rankings for the combined sewered municipalities within the PVSC service area are shown on Table 6-2. The City of Newark has a ranking of 12th most distressed municipality out of 565 statewide.

Table 6-2 – Municipal Renewal Index for the PVSC Combined Sewered Municipalities

Municipality	2017 Municipal Revitalization Index			Percentile of Least Resourced Municipalities
	MRI Score	MRI Distress Score	MRI Rank	
Bayonne	-4.56	40.2	82	15%
East Newark	-5.71	43.4	65	12%
Guttenberg	-5.12	41.8	70	12%
Harrison	-4.49	40.0	87	15%
Jersey City	-5.80	43.7	64	11%

[6-15] Measuring Distress in New Jersey: the 2017 Municipal Revitalization Index Office of Policy and Regulatory Affairs, New Jersey Department of Community Affairs.

Municipality	2017 Municipal Revitalization Index			Percentile of Least Resourced Municipalities
	MRI Score	MRI Distress Score	MRI Rank	
Kearny	-3.67	37.7	106	19%
Newark	**-16.53**	**73.5**	**12**	**2%**
North Bergen	-4.65	40.5	80	14%
Paterson	-19.43	81.6	8	1%

6.3 Demographic Trends

6.3.1 Municipal Population Trends

Newark has experienced a population decrease of over 15% percent since 1950 from 438,000 to 282,800. There has been an increase of around 3.4% between 2000 and 2016.

6.3.2 Household Number Trends

In 2000, 2010, and 2017, there were 91,400, 92,600 and 95,300 households respectively. Household size has remained stable at about 3 residents per household.

6.4 Implications of the Additional Economic Factors

The additional economic factors presented above were intended to provide additional context to the affordability and financial capability scores determined in this initial FCA. The context of this FCA and of the implementation of the LTCP is a combined sewered community with household incomes well below the federal and state levels, high poverty rates, and high local tax burdens. Newark is and is likely to remain financially distressed due to structural economic factors beyond its direct control and its ability to afford and finance future CSO control facilities is restricted.

7.0 Potential Impacts of the COVID-19 Pandemic on Affordability

The projections and conclusions concerning the affordability of the Municipal Control Alternative proposed in this SIAR by the City of Newark and Newark's financial capability to finance the Municipal Control Alternative are premised on the baseline financial conditions of Newark as well as the economic conditions in New Jersey and the United States generally at the time that work on this SIAR commenced. While the impacts of the pandemic on the long-term affordability of the CSO LTCP are obviously still unknown, it is reasonable to expect that there will be potentially significant impacts. There are several dimensions to these potential impacts, including reduced utility revenues and household incomes.

7.1 Potential Wastewater Utility Revenue Impacts

This Financial Capability Assessment cannot reflect the currently unknowable impacts on wastewater utility revenues stemming from the national economic upheaval resulting from the COVID-19 pandemic. It is however extremely likely that Newark and municipal wastewater

utilities in general across the United States will face significant and potentially permanent declines in revenues from households unable to pay their water and sewer bills and the sudden decline in industrial and commercial demands for potable water and wastewater treatment.

On March 20, 2020 the National Association of Clean Water Agencies (NACWA) issued a press release stating that:

> **"NACWA conservatively estimates the impact to clean water utilities nationwide of lost revenues due to coronavirus at $12.5 Billion.** This isa low-end estimate, assuming an average loss of revenue of 20% which is well within the range of what individual utilities are already projecting. Some utilities are anticipating closer to a 30% or 40% loss in revenue. This estimate is based on the substantial historical utility financial data NACWA has on file through its Financial Survey and recent reports from NACWA members on the decrease in usage they are observing in their systems over the last few weeks."[16]

The impact of a 20% to 40% revenue loss, along with increased costs that have been and will continue to be experienced by water and wastewater utilities such as overtime and the writing off of customer accounts receivable could have a profound impact on the affordability of the proposed CSO controls and Newark's ability to finance them.

Most of the costs of a municipal wastewater system are relatively fixed within broad operating ranges. Debt service and other capital costs are fixed once incurred. Some operating costs are somewhat variable with wastewater flows, e.g. chemical and electrical power usage but this variability is lessened by the reality that inflow, infiltration and stormwater flow in a combined system are not affected by billed water consumption. Labor costs are not directly variable, e.g. a twenty percent reduction in billed flow would not result in a need for twenty percent less labor. Maintenance costs might go down somewhat as equipment operating times may be reduced.

As costs do not decline proportionately to billed flow, it can be expected that user charge rates must be raised to generate sufficient revenue to sustain current operations. The relationship between changes in costs and revenues and the resultant changes in user charge rates is complex and has not yet been fully analyzed. At this point it can be assumed that user rate increases may be necessary to simply maintain current operations, and these rate increases will likely erode the financial capability of Newark to fund the CSO LTCP.

7.2 Potential Median Household Income Impacts

The impacts of the pandemic on median household incomes in Newark cannot be determined at this point. Historical analogies may provide some useful, albeit disturbing, context but are not presented as predictive:

- U.S. median household income fell by 6.2% from $53,000 in 2007 to $49,000 in 2010. In New Jersey, the MHI decreased by around 4.0% for the same period.[17]

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16 NACWA press release: Coronavirus Impacting Clean Water Agencies; Local Utilities and Ratepayers Need Assistance March 20, 2020

17 Source: Fact Sheet: Income and Poverty Across the States, 2010 Joint Economic Committee, United States Congress, Senator Robert P. Casey, Jr. Chairman.

- The U.S. unemployment rates rose from 5.0% in December of 2007 to 9.9% in December of 2009.[18]
- Data on impacts of the Great Depression on median household income are not available. As a proxy, the personal income per capita data are available. For 1929 this was $700. By 1933 this figure bottomed out at $376, a decline of 46%. Unemployment for the same period rose from around 3.0% to 25%.[19]

While a quantifiable assessment of the impact of the pandemic on median household income is not feasible at this time, reduction in base year MHI can be expected. This will further exacerbate the impacts of the revenue reductions described above on LTCP affordability, as higher base user charge rates will absorb an increased portion of lower MHI.

7.3 Implications for the Long Term CSO Control Program

Newark anticipates that the financial implications of the COVID-19 pandemic will be discussed with NJDEP during the review of the SIAR and as the 2021 – 2025 NJPDES permit is developed. Based on the October 1, 2020 revised due date for the SIAR, additional revenue data should be available to support a more specific refinement of this analysis in the SIAR.

Given the current and likely continuing uncertainties as to the New Jersey and national economic conditions, Newark will be reticent to commit to long term capital expenditures for CSO controls without the incorporation of adaptive management provisions, including provisions to revise and reschedule the long term CSO controls proposed in this SIAR based on emergent economic conditions beyond the permittees' control. As detailed in Section F of Newark's SIAR, these provisions could include scheduling the implementation of specific CSO control measures to occur during the five year NJPDES permit cycles. A revised affordability assessment should be performed during review of the next NJPDES permit to identify controls that are financially feasible during that next permit period.

8.0 Conclusion

The 1997 EPA guidance indicates that ratepayers and permittees who are highly burdened future expenditures added to their current wastewater treatment, conveyance, and collection costs can be allowed 15 years to complete capital projects to handle CSOs. In extreme cases, the guidance suggested a 20-year compliance schedule might be negotiated.[20]

The affordability analysis detailed above has documented that the $450 million (current dollars) Municipal Control Alternative documented in Newark's SIAR along with related operation and maintenance costs would result in a Residential Indicator of "medium impact" under EPA's criteria.

Circa 1997 EPA metrics notwithstanding, the reality of the high poverty rates, low household incomes compared to the rest of New Jersey and nationally and the high costs of living in

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18 Source: Bureau of Labor Statistics data series LNS1400000

19 Source: Federal Reserve Economic Data (FRED) data series: A792RC0A052NBEA

20 Combined Sewer Overflows – Guidance for Financial Capability Assessment and Schedule Development, EPA 832-B-97-004, Page 46.

Newark argue strongly that the EPA metric understates the impacts of the CSO control costs on the residents of the City. As evidenced by its New Jersey Municipal Revitalization Index score in the top 98th percentile, Newark's capacity for additional CSO controls beyond those proposed in the SIAR is limited.

Memorandum

To: *North Bergen Twp. & North Bergen MUA*

Copy: *Thomas Laustsen, Sheldon Lipke, Mike Hope, Tim Dupuis, Scott Craig*

From: *Tom Schevtchuk*

Date: *September 23, 2020*

Subject: *Final Financial Capability Assessment for North Bergen MUA – PVSC Service Area*

1.0 Executive Summary

This Financial Capability Analysis (FCA) memorandum is in support of the Municipal Control Alternative identified in the Selection and Implementation of Alternatives (SIAR) developed by the North Bergen Township. It quantifies the projected affordability impacts of North Bergen's proposed long term CSO controls for the North Bergen combined sewer system (CSS) and updates the 2019 preliminary FCA memo that was intended to guide the development and selection of long term controls. This memorandum jointly addresses the portions of North Bergen Township conveying wastewater to PVSC.

As summarized in Table E-1, this FCA includes the projected impacts if the CSO controls are undertaken by North Bergen alone (Municipal Control Alternative).

Projected Impacts of CSO Controls at a Glance	
Baseline: Typical Household 2019	
Annual Wastewater Costs	$557
Residential Indicator (RI)*	0.9%
Median Household Income (MHI)	$59,600
LTCP Control Options	
Capital Costs in million current $	$35.0
First Year After Fully Implemented	2041
LTCP Impact on Typical Household Cost in:	2041
Projected Median Household Income	$92,300
Annual Costs Without the LTCP	$1,231
Annual Costs With the LTCP	$1,280
Residential Indicator	
Without the LTCP	1.3%
With the LTCP	1.4%

While a regional alternative would result in lowered overall costs for the control of CSOs within the PVSC service area, the basis of this allocation remains under discussion as of the writing of this memorandum. Under this approach, both the costs of the regional facilities such as a relief interceptor and the resultant savings would be allocated amongst the PVSC municipalities with combined sewer systems. As the basis of this allocation remains under discussion as of the writing of this SIAR, this FCA memorandum focuses on implementation of the Municipal Control Alternative. Should the permittees come to agreement on the cost allocation for the Regional Control Plan, the FCA will be revisited to reassess the affordability and schedule for implementation of the LTCP.

The Financial Capability assessment is a two-step process including ***Affordability*** which evaluates the impact of the CSO control program on the residential ratepayers and ***Financial Capability*** which examines a permittee's ability to finance the program. Affordability is measured in terms of the Residential Indicator (RI) which is the percentage of median household income spent on wastewater services. Total wastewater services exceeding 2.0% of the median household income are considered to impose a high burden by USEPA. The financial capability analysis uses metrics similar to the municipal bond rating agencies.

The 2019 preliminary FCA determined that future capital expenditures for CSO controls and all other capital expenditures of approximately $110 million (current dollars) over a twenty-year period (2022 through 2041) would result in a RI exceeding 2.0% using a dynamic (time sensitive) model which accounts for future inflation.

North Bergen's SIAR projects future capital costs for the Municipal Control Alternative totaling $35 million (current dollars) through 2040 and incremental annual O&M costs of $200,000. This would result in a projected residential indicator in 2041, the first year after full implementation of the controls of 1.4% which would constitute a medium burden under the USEPA analytical guidelines.

The second step of the financial capability analysis documents that North Bergen's current financial capability strength is "mid-range". These two metrics combine on EPA's Financial Capability Matrix to indicate a medium burden under the USEPA guidance when the $35 million in capital expenditures proposed under North Bergen's Municipal Control Alternative.

This memorandum is based on information provided by North Bergen, PVSC and external sources such as the on-line fiscal reports available through the New Jersey Department of Community Affairs.[1]

The projections and conclusions concerning the affordability of the Municipal Control Alternative proposed in this SIAR by the North Bergen Township and North Bergen's financial capability to finance the CSO control program are premised on the baseline financial conditions of North Bergen as well as the economic conditions in New Jersey and the United States generally at the time that work on this SIAR commenced. While the impacts of the pandemic on the long-term affordability of the CSO LTCP are obviously still unknown, it is reasonable to expect that there will be potentially significant impacts. There are several dimensions to these potential impacts, including reduced utility revenues and household incomes.

2.0 Introduction

2.1 Intent of the Financial Capability Analysis

This document presents the final Financial Capability Analysis (FCA) relating to the development of the CSO Long Term Control Plan (LTCP) required under Paragraph G(8)(a) of the Combined Sewer Management section of a permittee's NJPDES discharge permit. The assessment is based upon the EPA document "Combined Sewer Overflows – Guidance for Financial Capability Assessment and Schedule Development," (EPA Guidance Document)

[1] https://www.nj.gov/dca/divisions/dlgs/resources/fiscal_rpts.shtml

published February 1997[2], as supplemented by EPA's November 2014 memorandum entitled "Financial Capability Assessment Framework for Municipal Clean Water Act Requirements".[3] A preliminary FCA memorandum was provided by PVSC to North Bergen and the other combined sewered permittees within its service area in August of 2019, with a subsequent update in December of 2019.

This final FCA and last year's preliminary versions support the twofold purposes of the FCA as envisioned in the 1994 CSO Control Policy[4] (Policy). First, the FCA is intended to identify the upper limits of what could constitute an affordable future investment strategy as defined by the Policy and related guidance documents under an assumed LTCP implementation schedule; thereby informing the development of CSO, SSO, MS4, TMDL, and other necessary control alternatives. Second, the financial and user cost (affordability) impacts of the selected CSO controls must be assessed to support the development of a workable implementation schedule for the LTCP.[5]

2.2 EPA's Two Step Analysis Process

The Financial Capability assessment is a two phased process. The residential indicator (RI) is the percentage of median household income (MHI) expended on wastewater (including stormwater) management. The upper limit of affordability for wastewater services within North Bergen will be the point where total wastewater management costs for the typical residential user in North Bergen exceed 2.0% of the Median Household Income (MHI). This metric of total wastewater management costs as a percentage of MHI is termed the Residential Indicator (RI) by USEPA.

The financial capability indicator is an assessment of the permittee's debt burden, socioeconomic conditions, and financial operations. These two measures are subsequently entered into a *financial capability matrix*, suggested by EPA, to determine the level of financial burden placed on residential customers and the permittee by the existing and projected future expenditures to operate, maintain, and enhance the wastewater management system. The EPA matrix appears in Table 5.1 of this document.

The projected future expenditures driving the RI and imposing demands upon the financial capability of North Bergen will include the implementation of CSO controls, stormwater controls, conveyance / collection system rehabilitation, in addition to the current debt service and other operational, maintenance, and planned capital improvements to the North Bergen

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2 EPA 832-B-97-004

3 November 24, 2014 memorandum from Ken Kopocis, Deputy Assistant Administrator, Office of Water (OW) and Cynthia Giles, Assistant Administrator, Office of Enforcement and Compliance (OECA) to Regional Administrators

4 Combined Sewer Overflow Policy Section II-C(8) 59 FR 18694

5 "Schedules for implementation of the long-term CSO control plan may be phased based on the relative importance of adverse impacts upon water quality standards and designated uses, and on a permittee's financial capability." (59 FR 18688)

sewer system that have been identified and provided by North Bergen Township and the North Bergen MUA for inclusion into this analysis.

2.3 Limitations to the EPA Analytical Framework

EPA's 1997 financial capability guidance calls for the use of a simplistic "snap shot" model which assumes that all future expenditures are incurred simultaneously and that costs and incomes should be based on current dollars. This approach has the advantage of eliminating the need to estimate future rates of inflation and income growth. However, this approach can understate the affordability impact of long-term programs since income growth has not kept pace with and is not projected to keep pace with water utility capital and O&M cost inflation. For example, for the period of 1999 through 2013, the national costs for typical household wastewater services increased at a rate of 4.8%.[6] The national Consumer Price Index increased at an annual rate of around 2.4%[7] for the period while the US median household income increased from around $42,000 to $52,250 at an annual rate of 1.6%.[8]

An affordability analysis that does not account for the continuing divergence between wastewater utility costs and income growth over course of a long term implementation schedule will overstate the "affordability" of the LTCP as future costs are recovered from the residential and other system users. Conversely, including current permittee expenditures or debt service payments which would end before the costs from the CSO controls are paid can understate future affordability.

EPA's November 24, 2014 memorandum encourages the use of a time-based ("dynamic" model per the memo) model to supplement the snapshot approach. PVSC has developed a time-based model that calculates annual costs and revenue requirements based on assumed program costs, schedules and economic variables such as interest and inflation rates. The residential indicator is calculated for each year based upon the costs per typical residential users which changes annually based on the annual system revenue requirements.

An additional limitation to the EPA methodology is its focus on the median household income (MHI) which therefore does not address the affordability impacts of wastewater service costs on the lower income households in North Bergen's or any service area. By definition, one half of the households in North Bergen would be paying more than 1.0% of their household income for wastewater services when the residential indicator for the MHI equals 1.0%.

Three of the six EPA financial capability metrics focus on general obligation (G.O.) bond rating criteria which are amortized through property tax or other general revenue streams:

- Overall Net Debt as a Percentage of Full Market Property Value;
- Property Tax Revenues as a Percent of Full Market Property Value; and
- Property Tax Revenue Collection Rate.

6 NACWA 2013 Cost of Clean Water Index

7 US Bureau of Labor Statistics

8 US Census

The assumption that G.O. bonds will be used would not be appropriate for financing by municipal authorities.

For this analysis only, it is assumed that financing through the New Jersey Environmental Finance Program will be used as necessary to meet projected construction draw requirements. The actual size and timing of financing necessary to implement the CSO controls will be determined by the eventual construction schedules for the various components of the CSO Controls and other wastewater capital improvement needs and are therefore beyond the scope of this document.

In addition to following guidelines for the affordability and financial capability metrics, EPA encourages inclusion of any information that would have a financial impact on the permittee in the capability report. This assessment, therefore, includes additional discussion of socioeconomic trends in North Bergen because of the financial challenges that the municipality faces.

3.0 Affordability Assessment

3.1 Baseline (2019) Wastewater Services Affordability

The Residential Indicator is an approximation of households' abilities to pay their total wastewater costs and is derived by dividing the total annual wastewater costs for the typical household within North Bergen's service area by the median household income within the service area. The Residential Indicator is compared to EPA-defined criteria to determine whether total annual wastewater costs impose a low, mid-range, or high impact on residential users. Table 3-1 shows U.S. EPA's Residential Indicator criteria, which define a "low" impact as a cost per household (CPH) less than 1.0% median household income (MHI), a "mid-range" impact between 1.0 and 2.0%, and "high" impact as greater than 2.0% of MHI.

Table 3-1. EPA Residential Indicator

Residential Indicator	Cost per Household
Low Burden	Less than 1.0 percent of MHI
Mid-Range Burden	1.0-2.0 percent of MHI
High Burden	Greater than 2.0 percent of MHI

The estimated annual cost for wastewater services for a typical single-family residential user for 2019 is $557. This estimate is based on typical residential potable water usage is 4,500 gallons monthly. Based on the estimated MHI of $59,600 the Residential Indicator is approximately 0.9%, or at the border between what the EPA guidance defines as a low burden and a medium burden.

In North Bergen, 15.8% of the population was living at or below the poverty line. This exceeds the national average poverty rate of 14.6%. The total Census households are broken out by income brackets on Table 3-2 below, along with the respective current Residential Indicators by

income bracket. The RI for each bracket was calculated from the mid-point income within the bracket. At the lowest income levels, the current RI is already between 2.6% and 10.6%.

Table 3-2. Analysis of the Current Residential Indicator

Income Bracket	Households		Bracket Average Income	Bracket RI at Typical Cost per Household
	Number	Cumulative		
Less than $10,000	1,887	1,887	$5,000	10.57%
$10,000 to $14,999	1,050	2,937	$12,500	4.23%
$15,000 to $24,999	2,117	5,054	$20,000	2.64%
$25,000 to $34,999	2,004	7,058	$30,000	1.76%
$35,000 to $49,999	2,623	9,681	$42,500	1.24%
$50,000 to $74,999	4,171	13,852	$62,500	0.85%
$75,000 to $99,999	2,859	16,711	$87,500	0.60%
$100,000 to $149,999	3,290	20,001	$125,000	0.42%
$150,000 to $199,999	1,007	21,008	$175,000	0.30%
$200,000 or more	924	21,932	$200,000	0.26%
Total	21,932			

3.2 Affordability Impacts of the Selected CSO Control Alternatives

North Bergen has identified a long term CSO control strategy that will achieve 85% capture of wet weather flows during the typical year. These controls are summarized on Table 3-3.

Table 3-3 – North Bergen's Selected CSO Controls

Wet Weather Control Types	Municipal Control Alternative	
	Capital Costs ($ millions)	Incremental Annual O&M Costs ($ millions)
Storage Tank at NB003 (5.0 MG)	$26.5	$0.14
Storage Tank at NB008 (0.8 MG)	$8.0	$0.06
Closure of outfall NB014	$0.1	$0.0
Green infrastructure (1.0 ac)	$0.4	$0.0
Totals	$35.0	$2.0

Implementation of the $35 million North Bergen Municipal Control Alternative results in projected annual costs per typical single family user of $701 (without inflation) and a residential indicator of 1.1% in 2041, the first year after the projected full implementation of the controls ending in 2040. Accounting for inflation, annual costs would grow to $1,280 with a residential indicator of 1.4% in 2041 as shown in Table 3-4.

Table 3-4 – North Bergen Projected Annual Costs and Residential Indicator Upon Full Implementation of the Municipal Control Alternative

Metric	Baseline (2019)	Cost per Typical Residential Wastewater User in 2041			
		No LTCP		LTCP Implementation Completed in 2040	
		With Inflation	Without Inflation	With Inflation	Without Inflation
RI	0.9%	1.3%	1.1%	1.4%	1.2%
Annual $	$557	$1,231	$654	$1,280	$701

The figures for 2041 include the debt service impacts of the ongoing expansion of North Bergen MUA's Woodcliff Sewage Treatment Plant.

Key points from Table 3-4 are:

- The base year (2019) cost per typical single family wastewater user in North Bergen was calculated to be $557 based on a monthly water consumption of 4,500 gallons. Based on a 2019 median household income of $59,600 this works out to a RI of 0.9%.
- The costs per typical single family user in 2041 is projected to increase to $1,231 annually without implementing the CSO controls due to inflation. This would represent a RI of 1.3%.
- Implementing a $35 million Municipal Control Alternative would result in annual costs per typical single family user of $1,280 in 2041, which works out to a 1.4% RI.
- Excluding inflation, the projected cost per typical single family user with the CSO controls would be around $701 in 2041, resulting in a RI of 1.2%.
- The analysis does not reflect the current and lingering financial impacts as a result of the COVID -19 pandemic and should be revisited upon finalizing the LTCP implementation schedule.

3.3 Underlying Assumptions

Key assumptions used in the above analysis are summarized on Table 3-5. An annotated complete list of all data and assumptions used in the affordability model is provided as an appendix to this memorandum.

Table 3-5 – Affordability Model Key Inputs and Assumptions

Item	Value	Notes
Finance		
Bond Term		
Market Interest Rate	6.0%	NJEIT Financing – Smart Growth program offers 75% funding at 0% interest and 25% funding at market rates for 20 years for CSO control projects.
NJDEP	0.0%	
Blended Interest Rate	1.5%	

Table 3-5 – Affordability Model Key Inputs and Assumptions

Item	Value	Notes
Target Coverage	125.00%	
O&M as % of Capital Cost	1.0%	
Economic		
LTCP O&M Inflation	4.0%	Based on national rates of wastewater system O&M costs in 2017 NACWA study.
LTCP Construction Inflation	3.7%	Based on 1984 – 2015 ENR Construction Cost Index for New York City (80%) and Philadelphia (20%).
Estimate Base Year		
MHI Data Year	2015	
Typical Household Monthly Consumption	4,500	Typical urban water consumption.
Demographic		
North Bergen Residential Connections		Municipal account data
North Bergen MHI	$57,300	American Community Survey Five Year Estimate 2013 – 2017 (inflated by Census to 2017)
Residential Share of Billed Water Consumption	4,500	

4.0 Analysis of Financial Capability Indictors

The second part of the financial capability assessment - calculation of the financial capability indicator for the permittee - includes six items that fall into three general categories of debt, socioeconomic, and financial management indicators. The six items are:

- Bond rating
- Total net debt as a percentage of full market real estate value
- Unemployment rate
- Median household income
- Property tax revenues as a percentage of full market property value
- Property tax revenue collection rate

Each item is given a score of three, two, or one, corresponding to ratings of strong, mid-range, or weak, according to EPA-suggested standards. The overall financial capability indicator is then derived by taking a simple average of the ratings. This value is then entered into the financial capability matrix to be compared with the residential indicator for an overall capability assessment). Table 4-1 contains the six criteria and the ratings that categorize the permittee as strong, mid-range, or weak in each category. A discussion of each item follows.

Table 4-1 Permittee Financial Capability Indicator Benchmarks

Indicator	Strong (3)	Mid-Range (2)	Weak (1)
Bond Rating	AAA-A (S&P) or Aaa-A (Moody's)	BBB (S&P) or Baa (Moody's)	BB-D (S&P) of Ba-C (Moody's)
Overall Net Debt as a Percent of Full Market Property Value	Below 2%	2% to 5%	Above 5%
Unemployment Rate	More than 1% below the National Average	+/- 1% of the National Average	More than 1% above the National Average
Median Household Income	More than 25% above National MHI	+/- 25% above National MHI	More than 25% below National MHI
Property Tax as a Percent of Full Market Property Value	Below 2%	2% to 4%	Above 4%
Property Tax Collection Rate	Above 98%	94% to 98%	Below 94%

This assessment covers North Bergen Township.

4.1 Bond Rating – Indicator 1

North Bergen's bond rating is Aa3 by Moody's Investor Services as of 2017. This rating results in a strong indicator rating under the EPA guidance.

4.2 Overall Direct Net Debt as a Percent of Full Market Value – Indicator 2

Debt Burden is measured by overall net debt as a percent of the three year average valuation, which evaluates the ability of local government to issue additional debt. Overall Net Debt is defined as current total liability to be repaid by property taxes divided by the municipality's full market property value. This indicator is relevant as a metric for municipalities issuing general obligation bonds which are substantially repaid through property tax revenues.

Overall direct net debt includes overlapping debt, which is the indebtedness of North Bergen, school district debt and that of Hudson County net of deductions. The North Bergen Township net debt was $58.3 million.[9] The three year average property valuation (2015 – 2017) was $5.1 billion. The percent of total net debt to full market value was 1.14%, also a strong value for this measure.

4.3 Unemployment Rate – Indicator 3

The unemployment rate is used as an assessment of the economic well-being of residential users in the service area. The U.S. EPA Guidance criteria for unemployment are described in Table 5-1, Unemployment Indicator Criteria.

The dataset for the municipal unemployment rates is taken from the US Census American Community Survey 2013-2017 estimates. The American Community Survey gathers data over a

[9] Source: NJDCA 2017 User Friendly Budget - Sheet UFB-10.

5-year period. The prevailing unemployment rate provided by the ACS for that timeframe more closely represents the actual strength of the economy in a municipality. The unemployment rate for North Bergen at 9.2% was 2.6% percent higher the national rate of 6.6% for the same time period. The "weak" rating is triggered in the EPA table when the local unemployment rate is one percent above the national average. It should also be noted that the above statistics are for North Bergen and should not be confused with Bureau of Labor Statistics data for the New York – Newark SMSA.

4.4 Median Household Income – Indicator 4

Median Household Income (MHI) divides the relevant incomes of a population into two parts so that half of the incomes are below the median and half of the incomes are above the median. Unlike average income, median income is not skewed by extremely high or extremely low incomes in the dataset. Table 4-2 shows that the MHI within the North Bergen was close to the national average, resulting in a midrange rating per the EPA metric.

Table 4-2 Median Household Income

	Median Household Income[10]
North Bergen	$57,300
United States	$57,650
% Difference	-1%
Categorization	Midrange

4.5 Property Tax Revenues as a % of Full Market Value – Indicator 5

The three-year average property valuation in North Bergen was $5.1 billion in 2017. A tax of $138.3 million was levied by all taxing jurisdictions resulting in an overall tax levy of approximately 2.71% of the three year average equalization value provided on the municipal information sheet. This is considered a midrange result under the EPA guidance.

4.6 Property Tax Collection Rate – Indicator 6

North Bergen's rate is estimated to be 98.6%, which places it in the strong range for real estate tax collections.

4.7 Financial Indicator Score

As shown on Table 4-3, the overall score for the financial indicators is 2.3, yielding an EPA Qualitative Score of midrange. This calculation is based on the use all six of the indicators that are applicable to North Bergen Township.

[10] Source: US Census – National Community Survey estimates for 2013 - 2017

Table 5-3 – Permittee Financial Capability Indicator Benchmarks

Indicator	Rating	Numeric Score
Bond Rating	Strong	3
Overall Net Debt as a Percent of Full Market Property Value	Strong	3
Unemployment Rate	Weak	1
Median Household Income	Midrange	2
Property Tax as a Percent of Full Market Property Value	Midrange	2
Property Tax Collection Rate	Strong	3
	Total	14
Overall Indicator Score: (numeric score / number of applicable indicators)		2.3
	EPA Qualitative Score	Midrange

5.0 Financial Capability Matrix

In this section the results of the step 1 affordability analysis which goes towards the residential ratepayers' ability to afford CSO controls within the context of other capital investment needs is integrated with the step 2 (Financial Capability) analysis which goes towards the permittee's ability to finance the implementation of the LTCP.

It was established previously that the proposed CSO control capital expenditures for the $35 million North Bergen Municipal Control Alternative would result in a Residential Indicator of 1.4% for the North Bergen This RI indicates a mid-range burden under the EPA framework.

The overall North Bergen financial capability rating would be considered to be midrange under the EPA framework. The intersection of these two ratings on the EPA financial capability matrix places the North Bergen sewer system in the category of medium financial burden, as shown on Table 5-1.

Table 5.1 The Financial Capability Matrix - (Shaded areas Indicate North Bergen's Ratings)

Permittee Financial Capability Indicators Score	Residential Indicator		
(Socioeconomic, Debt and Financial Indicators)	Low (Below 1.0%)	Mid-Range (Between 1.0 and 2.0%)	High (Above 2.0%)
Weak (Below 1.5)	Medium Burden	High Burden	High Burden
Mid-Range (Between 1.5 and 2.5)	Low Burden	**Medium Burden**	High Burden
Strong (Above 2.5)	Low Burden	Low Burden	Medium Burden

6.0 Additional Economic Factors

In addition to following EPA guidelines for completion of the financial capability assessment matrix, a discussion of socioeconomic trends in the North Bergen sewer system area is essential to the consideration of scheduling and compliance levels with CSO guidelines.

6.1 Cost of Living Factors

6.1.1 Cost of Living Index

Specific cost of living comparisons of North Bergen and national averages are not available. However, the cost of living for the Cities of Elizabeth and Newark is approximately 30% higher than the national average.[11] Using this value as a proxy, households in North Bergen face costs of living that are about 30% higher than the national average while earning an income that is about 1.0% lower than the national median income. Put another way, adjusting for the cost of living, the effective MHI in North Bergen is about 76% of the national MHI.

6.1.2 Housing Costs

One of the major drivers in the higher cost of living in North Bergen is the cost of housing. Housing costs in North Bergen are approximately 169%[12] of the national average. The Residential Indicator is a national screening parameter and does not account for localized factors which erode the effective household income. Based upon a 2017 study[13] by the National Low Income Housing Coalition, the fair market value of a two bedroom apartment in Hudson County was $1,519 per month which works out to 32% of the North Bergen median household income.

6.1.3 Local Tax Burdens

The property tax burdens within the combined sewered municipalities of the PVSC service area are substantial. The average residential tax for 2017 in North Bergen was $7,654. This includes North Bergen municipal purpose taxes of $3,424 along with Hudson County and school district taxes.[14] This compares with a national average local property tax levy of $3,500 for a similarly priced home. Moreover, as housing prices are higher in the New York – Newark metropolitan area than nationally, houses costing well over the national median value of $193,500 are purchased by families of modest incomes.

The high housing costs and tax burdens facing North Bergen households reduces their effective household income. Consequently, measuring the household burden imposed by wastewater costs as a percentage of the median household income may underestimate the financial burden of the projected wastewater costs per household. As was noted in an analysis of the impacts of CSO controls in the Boston region:

> *"The greater are the costs of other necessities as a share of MHI, the greater will be the economic burden associated with sewer charges equal to a given percent of MHI."* [15]

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11 http://www.infloplease.com/business/economy/cost of living - index.us-cities html

12 Using the Newark – Elizabeth cost of living indices.

13 Out of Reach 2017 – The High Cost of Housing National Low Income Housing Coalition.

14 Source: 2017 NJDCA User Friendly Budget sheet UFB-1

15 Assessment of the Economic Impact of Additional Combined Sewer Overflow Controls in the Massachusetts Water Resource Authority Service Area (page 13) prepared by Robert N. Stavins, Genia Long, and Judson Jaffee. Analysis Group Incorporated, August 2004.

6.2 Poverty Factors

6.2.1 Poverty Rate

In 2017 15.8% of the population in North Bergen was living at or below the poverty line. This compares to the national average poverty rate of 14.6%.

6.2.2 Household Income Brackets

When the Residential Indicator is 1.4% of median household income, by definition half of the households in North Bergen would be paying more than 1.4% of their household incomes for wastewater services. In areas with large percentages of low income households, the impacts of a 1.4% RI can be severe. As shown on Table 6-1 around 7,100 or about one third of the households would be paying between 2.8% to 16.5% of their household incomes for wastewater services, well above EPA's 2.0% metric for high burden.

Table 6-1 – Impact of the Municipal Control Alternative on the Residential Indicator

Income Bracket	Households		Estimated Population		RI Resulting from $35 Million in Capital Expenditures Through 2040	Bracket Average Income
	Number	Cumulative	Number	Cumulative		
Less than $10,000	1,887	1,887	5,229	5,229	16.5%	$5,000
$10,000 to $14,999	1,050	2,937	2,910	8,138	6.6%	$12,500
$15,000 to $24,999	2,117	5,054	5,866	14,005	4.1%	$20,000
$25,000 to $34,999	2,004	7,058	5,553	19,558	2.8%	$30,000
$35,000 to $49,999	2,623	9,681	7,268	26,826	1.9%	$42,500
$50,000 to $74,999	4,171	13,852	11,558	38,384	1.3%	$62,500
$75,000 to $99,999	2,859	16,711	7,922	46,306	0.9%	$87,500
$100,000 to $149,999	3,290	20,001	9,117	55,422	0.7%	$125,000
$150,000 to $199,999	1,007	21,008	2,790	58,213	0.5%	$175,000
$200,000 or more	924	21,932	2,560	60,773	0.4%	$200,000
Total	21,932		60,773			

6.2.3 New Jersey Department of Community Affairs Municipal Revitalization Index

New Jersey's Municipal Renewal Index[6-16] measures the social, economic, physical and financial conditions of the 565 municipalities within New Jersey. The MRI is compiled by the NJ Department of Community Affairs and is used in the distribution of needs based funding. Six primary along with four secondary criteria are used:

Primary Criteria

- Children on TANF (Temporary Assistance for Needy Families) per 1,000 persons
- Unemployment Rate
- Poverty Rate
- High school diploma or higher
- Median Household Income
- Percent of households receiving SNAP (food stamps)

Secondary Criteria

[6-16] Measuring Distress in New Jersey: the 2017 Municipal Revitalization Index Office of Policy and Regulatory Affairs, New Jersey Department of Community Affairs.

- Ten year rate of change in population
- Non-seasonal housing vacancy rate
- Equalized three year effective property tax rate
- Equalized property valuation per capita

The 2017 state-wide MRI rankings for the combined sewered municipalities within the PVSC service area are shown on Table 6-2. North Bergen has a ranking of 80th most distressed municipality out of 565.

Table 6-2 – Municipal Renewal Index for the PVSC Combined Sewered Municipalities

Municipality	2017 Municipal Revitalization Index			Percentile of Least Resourced Municipalities
	MRI Score	MRI Distress Score	MRI Rank	
Bayonne	-4.56	40.2	82	15%
East Newark	-5.71	43.4	65	12%
Guttenberg	-5.12	41.8	70	12%
Harrison	-4.49	40.0	87	15%
Jersey City	-5.80	43.7	64	11%
Kearny	-3.67	37.7	106	19%
Newark	-16.53	73.5	12	2%
North Bergen	**-4.65**	**40.5**	**80**	**14%**
Paterson	-19.43	81.6	8	1%

6.3 Implications of the Additional Economic Factors

The additional economic factors presented above were intended to provide additional context to the affordability and financial capability scores determined in this initial FCA. The context of this FCA and of the implementation of the LTCP is a combined sewered community with high cost of living and tax burdens that will limit the affordability of future CSO control facilities.

7.0 Potential Impacts of the COVID-19 Pandemic on Affordability

The projections and conclusions concerning the affordability of the Municipal Control Alternative proposed in this SIAR by the North Bergen Township and North Bergen's financial capability to finance the CSO control program are premised on the baseline financial conditions of North Bergen as well as the economic conditions in New Jersey and the United States generally at the time that work on this SIAR commenced. While the impacts of the pandemic on the long-term affordability of the CSO LTCP are obviously still unknown, it is reasonable to expect that there will be potentially significant impacts. There are several dimensions to these potential impacts, including reduced utility revenues and household incomes.

7.1 Potential Wastewater Utility Revenue Impacts

This Financial Capability Assessment cannot reflect the currently unknowable impacts on wastewater utility revenues stemming from the national economic upheaval resulting from the COVID-19 pandemic. It is however extremely likely that North Bergen and municipal wastewater utilities in general across the United States will face significant and potentially permanent declines in revenues from households unable to pay their water and sewer bills and the sudden decline in industrial and commercial demands for potable water and wastewater treatment.

On March 20, 2020 the National Association of Clean Water Agencies (NACWA) issued a press release stating that:

> **"NACWA conservatively estimates the impact to clean water utilities nationwide of lost revenues due to coronavirus at $12.5 Billion.** This isa low-end estimate, assuming an average loss of revenue of 20% which is well within the range of what individual utilities are already projecting. Some utilities are anticipating closer to a 30% or 40% loss in revenue. This estimate is based on the substantial historical utility financial data NACWA has on file through its Financial Survey and recent reports from NACWA members on the decrease in usage they are observing in their systems over the last few weeks."[17]

The impact of a 20% to 40% revenue loss, along with increased costs that have been and will continue to be experienced by water and wastewater utilities such as overtime and the writing off of customer accounts receivable could have a profound impact on the affordability of the proposed CSO controls and North Bergen's ability to finance them.

Most of the costs of a municipal wastewater system are relatively fixed within broad operating ranges. Debt service and other capital costs are fixed once incurred. Some operating costs are somewhat variable with wastewater flows, e.g. chemical and electrical power usage but this variability is lessened by the reality that inflow, infiltration and stormwater flow in a combined system are not affected by billed water consumption. Labor costs are not directly variable, e.g. a twenty percent reduction in billed flow would not result in a need for twenty percent less labor. Maintenance costs might go down somewhat as equipment operating times may be reduced.

As costs do not decline proportionately to billed flow, it can be expected that user charge rates must be raised to generate sufficient revenue to sustain current operations. The relationship between changes in costs and revenues and the resultant changes in user charge rates is complex and has not yet been fully analyzed. At this point it can be assumed that user rate increases may be necessary to simply maintain current operations, and these rate increases will likely erode the financial capability of North Bergen to fund the CSO LTCP.

7.2 Potential Median Household Income Impacts

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17 NACWA press release: Coronavirus Impacting Clean Water Agencies; Local Utilities and Ratepayers Need Assistance March 20, 2020

The impacts of the pandemic on median household incomes in North Bergen cannot be determined at this point. Historical analogies may provide some useful, albeit disturbing, context but are not presented as predictive:

- U.S. median household income fell by 6.2% from $53,000 in 2007 to $49,000 in 2010. In New Jersey, the MHI decreased by around 4.0% for the same period.[18]
- The U.S. unemployment rates rose from 5.0% in December of 2007 to 9.9% in December of 2009.[19]
- Data on impacts of the Great Depression on median household income are not available. As a proxy, the personal income per capita data are available. For 1929 this was $700. By 1933 this figure bottomed out at $376, a decline of 46%. Unemployment for the same period rose from around 3.0% to 25%.[20]

While a quantifiable assessment of the impact of the pandemic on median household income is not feasible at this time, reduction in base year MHI can be expected. This will further exacerbate the impacts of the revenue reductions described above on LTCP affordability, as higher base user charge rates will absorb an increased portion of lower MHI.

7.3 Implications for the Long Term CSO Control Program

North Bergen anticipates that the financial implications of the COVID-19 pandemic will be discussed with NJDEP during the review of the SIAR and as the 2021 – 2025 NJPDES permit is developed. Based on the October 1, 2020 revised due date for the SIAR, additional revenue data should be available to support a more specific refinement of this analysis in the SIAR.

Given the current and likely continuing uncertainties as to the New Jersey and national economic conditions, North Bergen will be reticent to commit to long term capital expenditures for CSO controls without the incorporation of adaptive management provisions, including provisions to revise and reschedule the long term CSO controls proposed in this SIAR based on emergent economic conditions beyond the permittees' control. As detailed in Section F of North Bergen's SIAR, these provisions could include scheduling the implementation of specific CSO control measures to occur during the five year NJPDES permit cycles. A revised affordability assessment should be performed during review of the next NJPDES permit to identify controls that are financially feasible during that next permit period.

8.0 Conclusion

The 1997 EPA guidance indicates that ratepayers and permittees who are highly burdened future expenditures added to their current wastewater treatment, conveyance, and collection

[18] Source: Fact Sheet: Income and Poverty Across the States, 2010 Joint Economic Committee, United States Congress, Senator Robert P. Casey, Jr. Chairman.
[19] Source: Bureau of Labor Statistics data series LNS1400000
[20] Source: Federal Reserve Economic Data (FRED) data series: A792RC0A052NBEA

costs can be allowed 15 years to complete capital projects to handle CSOs. In extreme cases, the guidance suggested a 20-year compliance schedule might be negotiated.[21]

The affordability analysis detailed above has documented that the $35 million (current dollars) Municipal Control Alternative documented in North Bergen's SIAR along with related operation and maintenance costs would result in a Residential Indicator of "medium impact" under EPA's criteria. Using the potential regional control approach would also result in a "medium impact".

Circa 1997 EPA metrics notwithstanding, the reality of the high poverty rates, low household incomes compared to the rest of New Jersey and nationally and the high costs of living in North Bergen argue strongly that the EPA metric understates the impacts of the CSO control costs on the residents of the City. As evidenced by its New Jersey Municipal Revitalization Index score in the top 86th percentile, North Bergen's capacity for additional CSO controls beyond those proposed in the SIAR is limited.

[21] Combined Sewer Overflows – Guidance for Financial Capability Assessment and Schedule Development, EPA 832-B-97-004, Page 46.

Memorandum

To: *City of Paterson*

Copy: *Thomas Laustsen, Sheldon Lipke, Mike Hope, Tim Dupuis, Scott Craig*

From: *Tom Schevtchuk*

Date: *September 25, 2020*

Subject: *Final Financial Capability Assessment for Paterson*

1.0 Executive Summary

This Financial Capability Analysis (FCA) memorandum is in support of the Municipal Control Alternative identified in the Selection and Implementation of Alternatives (SIAR) developed by the City of Paterson. It quantifies the projected affordability impacts of Paterson's proposed long term CSO controls for the Paterson combined sewer system (CSS) and updates the 2019 preliminary FCA memo that was intended to guide the development and selection of long term controls.

Table E-1 - Projected Impacts of CSO Controls at a Glance

Typical Household 2019	
Annual Wastewater Costs	$460
Residential Indicator (RI)*	1.1%
Median Household Income (MHI)	$40,000
LTCP Control Program	
CSO Control Capital Costs ($ millions)	$121.8
First Year After Full Implementation	2061
LTCP Impact on Typical Household Cost In:	2061
Median Household Income (MHI)	$84,200
Annual Costs Without LTCP	$1,257
Residential Indicator	1.5%
Annual Costs With LTCP	$1,683
Residential Indicator	2.0%

* Percent of median household income spent for wastewater services.

As summarized in Table E-1, this FCA includes the projected impacts if the CSO controls are undertaken by Paterson alone (Municipal Control Alternative) based on the costs included in Paterson's SIAR. For purposes of this analysis, the assumed implementation period for construction of the CSO controls is 2021 – 2060.

While a regional alternative would result in lowered overall costs for the control of CSOs within the PVSC service area, the basis of this allocation remains under discussion as of the writing of this memorandum. Under this approach, both the costs of the regional facilities such as a relief interceptor and the resultant savings would be allocated amongst the PVSC municipalities with combined sewer systems. As the basis of this allocation remains under discussion as of the writing of this SIAR, this FCA memorandum focuses on implementation of the Municipal Control Alternative. Should the permittees come to agreement on the cost allocation for the Regional Control Plan, the FCA will be revisited to reassess the affordability and schedule for implementation of the LTCP.

The Financial Capability assessment is a two-step process including ***Affordability*** which evaluates the impact of the CSO control program on the residential ratepayers and ***Financial Capability*** which examines a permittee's ability to finance the program. Affordability is

measured in terms of the Residential Indicator (RI) which is the percentage of median household income spent on wastewater services. Total wastewater services exceeding 2.0% of the median household income are considered to impose a high burden by USEPA. The financial capability analysis uses metrics similar to the municipal bond rating agencies.

The 2019 preliminary FCA determined that future capital expenditures for CSO controls and all other capital expenditures of approximately $10 million (current dollars) over a twenty-year period (2022 through 2041) would result in a RI exceeding 2.0% using a dynamic (time sensitive) model which accounts for future inflation. Along with the calculated debt service costs associated with the $10 million in capital costs an annual incremental operations and maintenance (O&M) cost of $100,000 or 1.0% of the capital cost value was estimated.

Paterson's SIAR projects future capital costs for the Municipal Control Alternative totaling $122 million through 2060 and incremental annual O&M costs of $270,000. This would result in a projected residential indicator in 2061 the first year after full implementation of the controls of 2.0% which would constitute a high burden under the USEPA analytical guidelines.

The second step of the financial capability analysis documents that Paterson's current financial capability strength is "midrange". These two metrics combine on EPA's Financial Capability Matrix to indicate a high burden under the USEPA guidance when the $122 million in capital expenditures proposed under Paterson's Municipal Control Alternative.

This draft memorandum is based on information provided by the City of Paterson, PVSC and external sources such as the on-line fiscal reports available through the New Jersey Department of Community Affairs.[1]

The projections and conclusions concerning the affordability of the Municipal Control Alternative proposed in this SIAR by the City of Paterson and Paterson's financial capability to finance the CSO control program are premised on the baseline financial conditions of Paterson as well as the economic conditions in New Jersey and the United States generally at the time that work on this SIAR commenced. While the impacts of the pandemic on the long-term affordability of the CSO LTCP are obviously still unknown, it is reasonable to expect that there will be potentially significant impacts. There are several dimensions to these potential impacts, including reduced utility revenues and household incomes.

2.0 Introduction

2.1 Intent of the Financial Capability Analysis

This document presents the final Financial Capability Analysis (FCA) relating to the development of the CSO Long Term Control Plan (LTCP) required under Paragraph G(8)(a) of the Combined Sewer Management section of a permittee's NJPDES discharge permit. The assessment is based upon the EPA document "Combined Sewer Overflows – Guidance for Financial Capability Assessment and Schedule Development," (EPA Guidance Document) published February 1997[2], as supplemented by EPA's November 2014 memorandum entitled

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1 https://www.nj.gov/dca/divisions/dlgs/resources/fiscal_rpts.shtml

2 EPA 832-B-97-004

"Financial Capability Assessment Framework for Municipal Clean Water Act Requirements".[3] A preliminary FCA memorandum was provided by PVSC to Paterson and the other combined sewered permittees within its service area in August of 2019, with a subsequent update in December of 2019.

This final FCA and last year's preliminary version supports the twofold purposes of the FCA as envisioned in the 1994 CSO Control Policy[4] (Policy). First, the FCA is intended to identify the upper limits of what could constitute an affordable future investment strategy as defined by the Policy and related guidance documents under an assumed LTCP implementation schedule; thereby informing the development of CSO, SSO, MS4, TMDL, and other necessary control alternatives. Second, the financial and user cost (affordability) impacts of the selected CSO controls must be assessed to support the development of a workable implementation schedule for the LTCP.[5]

2.2 EPA's Two Step Analysis Process

The Financial Capability assessment is a two phased process. The residential indicator (RI) is the percentage of median household income (MHI) expended on wastewater (including stormwater) management. The upper limit of affordability for wastewater services within the Paterson will be the point where total wastewater management costs for the typical residential user in Paterson exceed 2.0% of the Median Household Income (MHI). This metric of total wastewater management costs as a percentage of MHI is termed the Residential Indicator (RI) by USEPA.

The financial capability indicator is an assessment of the permittee's debt burden, socioeconomic conditions, and financial operations. These two measures are subsequently entered into a *financial capability matrix*, suggested by EPA, to determine the level of financial burden placed on residential customers and the permittee by the existing and projected future expenditures to operate, maintain, and enhance the wastewater management system. The EPA matrix appears in Table 5.1 of this document.

The projected future expenditures driving the RI and imposing demands upon the financial capability of Paterson will include the implementation of CSO controls, stormwater controls, conveyance / collection system rehabilitation, in addition to the current debt service and other operational, maintenance, and planned capital improvements to Paterson sewer system that have been identified and provided by the City for inclusion into this analysis.

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[3] November 24, 2014 memorandum from Ken Kopocis, Deputy Assistant Administrator, Office of Water (OW) and Cynthia Giles, Assistant Administrator, Office of Enforcement and Compliance (OECA) to Regional Administrators

[4] Combined Sewer Overflow Policy Section II-C(8) 59 FR 18694

[5] "Schedules for implementation of the long-term CSO control plan may be phased based on the relative importance of adverse impacts upon water quality standards and designated uses, and on a permittee's financial capability." (59 FR 18688)

2.3 Limitations to the EPA Analytical Framework

EPA's 1997 financial capability guidance calls for the use of a simplistic "snap shot" model which assumes that all future expenditures are incurred simultaneously and that costs and incomes should be based on current dollars. This approach has the advantage of eliminating the need to estimate future rates of inflation and income growth. However, this approach can understate the affordability impact of long-term programs since income growth has not kept pace with and is not projected to keep pace with water utility capital and O&M cost inflation. For example, for the period of 1999 through 2013, the national costs for typical household wastewater services increased at a rate of 4.8%.[6] The national Consumer Price Index increased an annual rate of around 2.6%[7] for the period while the US median household income increased from around $42,000 to $52,250 at an annual rate of 1.6%.[8]

An affordability analysis that does not account for the continuing divergence between wastewater utility costs and income growth over course of a long term implementation schedule will overstate the "affordability" of the LTCP as future costs are recovered from the residential and other system users. Conversely, including current permittee expenditures or debt service payments which would end before the costs from the CSO controls are paid can understate future affordability.

EPA's November 24, 2014 memorandum encourages the use of a time-based ("dynamic" model per the memo) model to supplement the snapshot approach. PVSC has developed a time-based model that calculates annual costs and revenue requirements based on assumed program costs, schedules and economic variables such as interest and inflation rates. The residential indicator is calculated for each year based upon the costs per typical residential users which changes annually based on the annual system revenue requirements.

An additional limitation to the EPA methodology is its focus on the median household income (MHI) which therefore does not address the affordability impacts of wastewater service costs on the lower income households in Paterson's or any service area. By definition, one half of the households in Paterson would be paying more than 1.0% of their household income for wastewater services when the residential indicator for the MHI equals 1.0%.

Three of the six EPA financial capability metrics focus on general obligation (G.O.) bond rating criteria which are amortized through property tax or other general revenue streams:

- Overall Net Debt as a Percentage of Full Market Property Value;
- Property Tax Revenues as a Percent of Full Market Property Value; and
- Property Tax Revenue Collection Rate.

The assumption that G.O. bonds will be used would not be appropriate for financing by municipal authorities.

6 NACWA 2013 Cost of Clean Water Index

7 US Bureau of Labor Statistics

8 US Census

For this analysis only, it is assumed that financing through the New Jersey Environmental Finance Program will be used as necessary to meet projected construction draw requirements. The actual size and timing of financing necessary to implement the CSO controls will be determined by the eventual construction schedules for the various components of the CSO Controls and other wastewater capital improvement needs and are therefore beyond the scope of this document.

In addition to following guidelines for the affordability and financial capability metrics, EPA encourages inclusion of any information that would have a financial impact on the permittee in the capability report. This assessment, therefore, includes additional discussion of socioeconomic trends in Paterson because of the financial challenges that the municipality faces.

3.0 Affordability Assessment

3.1 Baseline (2019) Wastewater Services Affordability

The Residential Indicator is an approximation of households' abilities to pay their total wastewater costs and is derived by dividing the total annual wastewater costs for the typical household within the permittee's service area by the median household income within the service area. The Residential Indicator is compared to EPA-defined criteria to determine whether total annual wastewater costs impose a low, mid-range, or high impact on residential users. Table 3-1 shows U.S. EPA's Residential Indicator criteria, which define a "low" impact as a cost per household (CPH) less than 1.0% median household income (MHI), a "mid-range" impact between 1.0 and 2.0%, and "high" impact as greater than 2.0% of MHI.

Table 3-1. EPA Residential Indicator

Residential Indicator	Cost per Household
Low Burden	Less than 1.0 percent of MHI
Mid-Range Burden	1.0-2.0 percent of MHI
High Burden	Greater than 2.0 percent of MHI

The estimated annual cost for wastewater services for a typical single-family residential user for 2019 is $460. This estimate is based on typical residential potable water usage is 4,500 gallons monthly. Based on the estimated 2019 MHI of $40,000 the Residential Indicator is approximately 1.1%, or what the EPA guidance defines as a medium burden. By definition the current residential indicator for one half of the households is greater than the 1.1%.

In Paterson, 29% of the population was living below the poverty line, over two times the national average of 14.6%. The total Census households are broken out by income brackets on Table 3-2 below, along with the respective current Residential Indicators by income bracket. The RI for each bracket was calculated from the mid-point income within the bracket. At the lowest income levels, the current RI is already well over 2.3%.

Table 3-2. Analysis of the Current Residential Indicator

Income Bracket	Households		Bracket Average	Bracket RI
	Number	Cumulative		
Less than $10,000	6,379	6,379	$5,000	9.2%
$10,000 to $14,999	3,445	9,824	$12,500	3.7%
$15,000 to $24,999	6,340	16,164	$20,000	2.3%
$25,000 to $34,999	5,096	21,260	$30,000	1.5%
$35,000 to $49,999	6,526	27,786	$42,500	1.1%
$50,000 to $74,999	6,335	34,121	$62,500	0.7%
$75,000 to $99,999	4,307	38,428	$87,500	0.5%
$100,000 to $149,999	3,723	42,151	$125,000	0.4%
$150,000 to $199,999	837	42,988	$175,000	0.3%
$200,000 or more	798	43,786	$200,000	0.2%
Total	43,786			

3.2 Affordability Impacts of the Selected CSO Control Alternatives

Paterson has identified a long term CSO control strategy that will achieve 85% capture of wet weather flows during the typical year. These controls are summarized on Table 3-3.

Table 3-3 – Paterson's Selected CSO Controls

Wet Weather Control Types	Future Capital Costs ($ millions)
Green Infrastructure	$29.3
Sewer Separation at CSO 023	$8.9
19th Ave. Relief Sewer for CSO 030	$49.9
15' Diam. 1,600 LF Storage Tunnel at CSO 025	$33.7
Total	$121.8
Incremental Annual O&M Costs	$270,000

Implementation of the $122 million Municipal Control Alternative results in projected annual costs per typical single family user of $633 (without inflation) and a residential indicator of 1.6% in 2061, the first year after the projected full implementation of the controls ending in 2060. Accounting for inflation, annual costs would grow to $1,683 with a residential indicator of 2.0% in 2061 as shown in Table 3-4.

Table 3-4 – Permittee Projected Residential Indicator Upon Full Implementation of the Municipal Control Alternative

Metric	Baseline (2019)	Cost per Typical Residential Wastewater User in 2061			
		No LTCP		LTCP Implementation Completed in 2060	
		With Inflation	Without Inflation	With Inflation	Without Inflation
RI	1.1%	1.5%	1.1%	2.0%	1.6%
Annual $	$460	$1,257	$460	$1,683	$633

Key points from Table 3-4 are:

- The base year (2019) cost per typical single family wastewater user in Paterson was calculated to be $460 based on a monthly water consumption of 4,500 gallons. Based on a 2019 median household income of $40,000; this works out to a RI of 1.1%.
- The costs per typical single family user in Paterson is projected to increase to $1,257 annually without implementing the CSO controls due to inflation. This would represent a RI of 1.5%.
- Implementing a $122 million Municipal Control Alternative with capital costs completed in 2060 years would result in annual costs per typical single family user of $1,683 in 2061, which works out to a 2.0% RI.
- Excluding inflation, the projected cost per typical single family user with the CSO controls would be around $633 in 2061, with a RI of 1.6%.
- The analysis does not reflect the current and lingering financial impacts as a result of the COVID -19 pandemic and should be revisited upon finalizing the LTCP implementation schedule.

3.3 Underlying Assumptions

Key assumptions used in the above analysis are summarized on Table 3-5. An annotated complete list of all data and assumptions used in the affordability model is provided as an appendix to this memorandum.

Table 3-5 – Affordability Model Key Inputs and Assumptions

Item	Value	Notes
Finance		
Bond Terms		
Market Interest Rate	6.0%	NJEIT Financing – Smart Growth program offers 75% funding at 0% interest and 25% funding at market rates for 30 years for CSO control projects.
NJDEP	0.0%	
Blended Interest Rate	1.5%	
Target Coverage	125.00%	
O&M as % of Capital Cost	2.0%	

Table 3-5 – Affordability Model Key Inputs and Assumptions

Item	Value	Notes
Economic & Demographic		
LTCP O&M Inflation	3.9%	Based on national rates of wastewater system O&M costs in 2017 NACWA study.
LTCP Construction Inflation	3.7%	Based on 1984 – 2015 ENR Construction Cost Index for New York City (80%) and Philadelphia (20%).
Estimate Base Year		
MHI Data Year	2015	
Typical Household Monthly Consumption	4,500	Typical urban water consumption.
Paterson MHI	$40,000	American Community Survey
MHI Growth Rate	1.8%	Annualized MHI growth rate from 2010 to 2018

4.0 Analysis of Financial Capability Indictors

The second part of the financial capability assessment - calculation of the financial capability indicator for the permittee - includes six items that fall into three general categories of debt, socioeconomic, and financial management indicators. The six items are:

- Bond rating
- Total net debt as a percentage of full market real estate value
- Unemployment rate
- Median household income
- Property tax revenues as a percentage of full market property value
- Property tax revenue collection rate

Each item is given a score of three, two, or one, corresponding to ratings of strong, mid-range, or weak, according to EPA-suggested standards. The overall financial capability indicator is then derived by taking a simple average of the ratings. This value is then entered into the financial capability matrix to be compared with the residential indicator for an overall capability assessment). Table 4-1 contains the six criteria and the ratings that categorize the permittee as strong, mid-range, or weak in each category. A discussion of each item follows.

Table 4-1 Permittee Financial Capability Indicator Benchmarks

Indicator	Strong (3)	Mid-Range (2)	Weak (1)
Bond Rating	AAA-A (S&P) or Aaa-A (Moody's)	BBB (S&P) or Baa (Moody's)	BB-D (S&P) of Ba-C (Moody's)
Overall Net Debt as a Percent of Full Market Property Value	Below 2%	2% to 5%	Above 5%
Unemployment Rate	More than 1% below the National Average	+/- 1% of the National Average	More than 1% above the National Average

Indicator	Strong (3)	Mid-Range (2)	Weak (1)
Median Household Income	More than 25% above National MHI	+/- 25% above National MHI	More than 25% below National MHI
Property Tax as a Percent of Full Market Property Value	Below 2%	2% to 4%	Above 4%
Property Tax Collection Rate	Above 98%	94% to 98%	Below 94%

4.1 Bond Rating – Indicator 1

Paterson's bond rating is Ba1 by Moody's Investor Services of 2016, considered to be midrange under the EPA guidance.

4.2 Overall Net Debt as a Percent of Full Market Value – Indicator 2

Debt Burden is measured by overall net debt as a percent of the three-year average property valuation, which evaluates the ability of local government to issue additional debt. Overall Net Debt is defined as current total liability to be repaid by property taxes divided by the municipality's full market property value. This indicator is relevant as a metric for municipalities issuing general obligation bonds which are substantially repaid through property tax revenues.

Overall net debt includes applicable overlapping debt totaled $122.6 million.[9] The percent of total net debt to full market value was 1.9% based on the three-year valuation of $6.35 billion, placing it in the strong range on this measure.

4.3 Unemployment Rate – Indicator 3

The unemployment rate is used as an assessment of the economic well-being of residential users in the service area. The U.S. EPA Guidance criteria for unemployment are described in Table 5-1, Unemployment Indicator Criteria.

The dataset for the municipal unemployment rates is taken from the US Census American Community Survey 2013-2017 estimates. The American Community Survey gathers data over a 5-year period. The prevailing unemployment rate provided by the ACS for that timeframe more closely represents the actual strength of the economy in a municipality. The unemployment rate for Paterson at 6.4% was 0.2% lower than the national rate of 6.6% for the same time period for a midrange rating under the EPA criteria. It should be noted that the above statistics are for Paterson and should not be confused with Bureau of Labor Statistics data for the New York – Newark SMSA.

4.4 Median Household Income – Indicator 4

Median Household Income (MHI) divides the relevant incomes of a population into two parts so that half of the incomes are below the median and half of the incomes are above the median. Unlike average income, median income is not skewed by extremely high or extremely low

[9] Source: NJDCA 2018 User Friendly Budget sheet UFB-10

incomes in the dataset. Table 4-2 shows that the MHI within the Paterson is significantly lower than the national average, resulting in a weak rating per the EPA metric.

Table 4-2 Median Household Income

	Median Household Income[10]
Paterson	$36,100
United States	$57,650
% Difference	-37%
Categorization	Weak

4.5 Property Tax Revenues as a % of Full Market Value – Indicator 5

The three-year average property valuation in Paterson is $6.35 billion. A tax of $242.7 million is levied on the assessed valuation. Therefore, the property tax levy is approximately 3.8% of the three-year average equalization value provided on the municipal information sheet which is midrange.

4.6 Property Tax Collection Rate – Indicator 6

The EPA criterion for a strong rating in this category is a collection rate of more than 98%. Paterson's rate was 96.4%, which places it in the weak range for real estate tax collections.

4.7 Financial Indicator Score

As shown on Table 4-3, the overall score for the financial indicators is 1.83, yielding an EPA Qualitative Score of midrange. This calculation is based on the use of all of the six indicators that are applicable to Paterson.

Table 4-3 – Permittee Financial Capability Indicator Benchmarks

Indicator	Rating	Numeric Score
Bond Rating	Midrange	2
Overall Net Debt as a Percent of Full Market Property Value	Strong	3
Unemployment Rate	Weak	1
Median Household Income	Midrange	2
Property Tax as a Percent of Full Market Property Value	Midrange	2
Property Tax Collection Rate	Weak	1
	Total	10
Overall Indicator Score: (numeric score / number of applicable indicators)		1.8
	EPA Qualitative Score	Midrange

[10] Source: US Census – National Community Survey estimates for 2013 - 2017

5.0 Financial Capability Matrix

In this section the results of the step 1 affordability analysis which goes towards the residential ratepayers' ability to afford CSO controls within the context of other capital investment needs is integrated with the step 2 (Financial Capability) analysis which goes towards the permittee's ability to finance the implementation of the LTCP.

It was established previously that capital expenditures of $122 million for the Paterson Municipal Control Alternative would result in a Residential Indicator of 2.0% of median household income at the 2.0% threshold for high burden under the EPA criteria.

The overall Paterson financial capability rating considered to be midrange under the EPA framework. The intersection of these two ratings on the EPA financial capability matrix places the Paterson sewer system in the category of high financial burden, as shown on Table 5-1.

Table 5-1 – The Financial Capability Matrix - (Shaded areas Indicate Paterson's Ratings)

Permittee Financial Capability Indicators Score	Residential Indicator		
(Socioeconomic, Debt and Financial Indicators)	Low (Below 1.0%)	Mid-Range (Between 1.0 and 2.0%)	High (Above 2.0%)
Weak (Below 1.5)	Medium Burden	High Burden	High Burden
Mid-Range (Between 1.5 and 2.5)	Low Burden	Medium Burden	**High Burden**
Strong (Above 2.5)	Low Burden	Low Burden	Medium Burden

6.0 Additional Economic Factors

In addition to following EPA guidelines for completion of the financial capability assessment matrix, a discussion of socioeconomic trends in Paterson's sewer system area is essential to the consideration of scheduling and compliance levels with CSO guidelines.

6.1 Cost of Living Factors

6.1.1 Cost of Living Index

Specific cost of living comparisons of Paterson and national averages are not available. However, the cost of living for the Cities of Elizabeth and Newark is approximately 30% higher than the national average.[11] Using this value as a proxy, households in Paterson face costs of living that are about 30% higher than the national average while earning an income that is

[11] http://www.infloplease.com/business/economy/cost of living - index.us-cities html

about 33% higher than the national median income. Put another way, adjusting for the cost of living, the effective MHI in Paterson is about 48% of the national MHI.

6.1.2 Housing Costs

One of the major drivers in the higher cost of living in Paterson is the cost of housing. Housing costs in Paterson are approximately 169%[12] of the national average. The Residential Indicator is a national screening parameter and does not account for localized factors which erode the effective household income. Based upon a 2017 study[13] by the National Low Income Housing Coalition, the fair market value of a two bedroom apartment in Passaic County was $1,557 per month which works out to 52% of the Paterson median household income.

6.1.3 Local Tax Burdens

The property tax burdens within the combined sewered municipalities of the PVSC service area are substantial. Based on an average residential assessment within Paterson of $185,023, the current property tax levy is about $7,697. This compares with a national average local property tax levy of $3,500. Moreover, as housing prices are higher in the New York – Newark metropolitan area than nationally, houses costing well over the national median value of $193,500 are purchased or rented by families of modest incomes.

The high housing costs and tax burdens facing Paterson households reduces their effective household income. Consequently, measuring the household burden imposed by wastewater costs as a percentage of the median household income may underestimate the financial burden of the projected wastewater costs per household. As was noted in an analysis of the impacts of CSO controls in the Boston region:

> *"The greater are the costs of other necessities as a share of MHI, the greater will be the economic burden associated with sewer charges equal to a given percent of MHI."* [14]

6.2 Poverty Factors

6.2.1 Poverty Rate

In 2017 29% of the population in Paterson was living at or below the poverty line. This is twice the national average poverty rate of 14.6%.

6.2.2 Household Income Brackets

When the Residential Indicator is at 2.0% of median household income as would be the case with the proposed CSO controls, by definition half of the households in Paterson would be paying more than the 2.0% of their household incomes for wastewater services. In areas with large percentages of low income households, the impacts of a 2.0% residential indicator can be

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12 Using the Newark – Elizabeth cost of living indices.

13 Out of Reach 2017 – The High Cost of Housing National Low Income Housing Coalition.

14 Assessment of the Economic Impact of Additional Combined Sewer Overflow Controls in the Massachusetts Water Resource Authority Service Area (page 13) prepared by Robert N. Stavins, Genia Long, and Judson Jaffee. Analysis Group Incorporated, August 2004.

severe as shown on Table 6-1, e.g. around 16,200 households would at typical single family residential water usage have wastewater services costs exceeding 4.0% of household income.

Table 6-1 – Impact of the Municipal Control Alternative on the Residential Indicator

Income Bracket	Households		Estimated Population		RI Resulting from $122 Million through2060	Bracket Average Income
	Number	Cumulative	Number	Cumulative		
Less than $10,000	6,379	6,379	26,128	26,128	16.0%	$5,000
$10,000 to $14,999	3,445	9,824	14,111	40,239	6.4%	$12,500
$15,000 to $24,999	6,340	16,164	25,969	66,208	4.0%	$20,000
$25,000 to $34,999	5,096	21,260	20,873	87,081	2.7%	$30,000
$35,000 to $49,999	6,526	27,786	26,730	113,811	1.9%	$42,500
$50,000 to $74,999	6,335	34,121	25,948	139,759	1.3%	$62,500
$75,000 to $99,999	4,307	38,428	17,641	157,401	0.9%	$87,500
$100,000 to $149,999	3,723	42,151	15,249	172,650	0.6%	$125,000
$150,000 to $199,999	837	42,988	3,428	176,079	0.5%	$175,000
$200,000 or more	798	43,786	3,269	179,347	0.4%	$200,000
Total	43,786		179,347			

6.2.2 Income Growth Trends

The Paterson MHI growth has been lower compared to the income growth experienced in the State of New Jersey and in the United States from 2010 to 2018. In Paterson, the MHI increased from $35,600 in 2000 to $36,100 in 2017 or 1.2% for the period. This reflects a growth rate of around 0.07%. The MHI increases during that period in New Jersey, and the United States were 39% and 37%, respectively. The Paterson MHI actually decreased somewhat between 2000 and 2010 to $34,100, likely reflecting the impact of the 2008-2009 recession. Income growth has picked up somewhat subsequently. The estimated 2018 MHI for Paterson was $39,300. This represents a 1.8% annual growth rate. This growth rate was used to project MHI in the FCA model.

6.2.3 New Jersey Department of Community Affairs Municipal Revitalization Index

New Jersey's Municipal Renewal Index[6-15] measures the social, economic, physical and financial conditions of the 565 municipalities within New Jersey. The MRI is compiled by the NJ Department of Community Affairs and is used in the distribution of needs based funding. Six primary along with four secondary criteria are used:

[6-15] Measuring Distress in New Jersey: the 2017 Municipal Revitalization Index Office of Policy and Regulatory Affairs, New Jersey Department of Community Affairs.

Primary Criteria

- Children on TANF (Temporary Assistance for Needy Families) per 1,000 persons
- Unemployment Rate
- Poverty Rate
- High school diploma or higher
- Median Household Income
- Percent of households receiving SNAP (food stamps)

Secondary Criteria

- Ten year rate of change in population
- Non-seasonal housing vacancy rate
- Equalized three year effective property tax rate
- Equalized property valuation per capita

The 2017 state-wide MRI rankings for the combined sewered municipalities within the PVSC service area are shown on Table 6-2. Paterson has a ranking of 8th most distressed municipality out of 565.

Table 6-2 – Municipal Renewal Index for the PVSC Combined Sewered Municipalities

Municipality	2017 Municipal Revitalization Index			Percentile of Least Resourced Municipalities
	MRI Score	MRI Distress Score	MRI Rank	
Bayonne	-4.56	40.2	82	15%
East Newark	-5.71	43.4	65	12%
Guttenberg	-5.12	41.8	70	12%
Harrison	-4.49	40.0	87	15%
Jersey City	-5.80	43.7	64	11%
Kearny	-3.67	37.7	106	19%
Newark	-16.53	73.5	12	2%
North Bergen	-4.65	40.5	80	14%
Paterson	**-19.43**	**81.6**	**8**	**1%**

6.3 Implications of the Additional Economic Factors

The additional economic factors presented above were intended to provide additional context to the affordability and financial capability scores determined in this initial FCA. The context of

this FCA and of the implementation of the LTCP is a combined sewered community with household incomes well below the federal and state levels, high poverty rates, and high local tax burdens. Paterson is and is likely to remain financially distressed due to structural economic factors beyond its direct control and its ability to afford and finance future CSO control facilities is restricted.

7.0 Potential Impacts of the COVID-19 Pandemic on Affordability

The projections and conclusions concerning the affordability of the Municipal Control Alternative proposed in this SIAR by Paterson and Paterson's financial capability to finance the CSO control program are premised on the baseline financial conditions of Paterson as well as the economic conditions in New Jersey and the United States generally at the time that work on this SIAR commenced. While the impacts of the pandemic on the long-term affordability of the CSO LTCP are obviously still unknown, it is reasonable to expect that there will be impacts, potentially significant impacts. There are several dimensions to these potential impacts, including both potentially reduced utility revenues, and potentially reduced household incomes.

7.1 Potential Wastewater Utility Revenue Impacts

This Financial Capability Assessment cannot reflect the currently unknowable impacts on wastewater utility revenues stemming from the national economic upheaval resulting from the COVID-19 pandemic. It is however extremely likely that Paterson and municipal wastewater utilities in general across the United States will face significant and potentially permanent declines in revenues from households unable to pay their water and sewer bills and the sudden decline in industrial and commercial demands for potable water and wastewater treatment.

On March 20, 2020 the National Association of Clean Water Agencies (NACWA) issued a press release stating that:

> **"NACWA conservatively estimates the impact to clean water utilities nationwide of lost revenues due to coronavirus at $12.5 Billion.** This is a low-end estimate, assuming an average loss of revenue of 20% which is well within the range of what individual utilities are already projecting. Some utilities are anticipating closer to a 30% or 40% loss in revenue. This estimate is based on the substantial historical utility financial data NACWA has on file through its Financial Survey and recent reports from NACWA members on the decrease in usage they are observing in their systems over the last few weeks."[16]

The impact of a 20% to 40% revenue loss, along with increased costs that have been and will continue to be experienced by water and wastewater utilities such as overtime and the writing off of customer accounts receivable could have a profound impact on the affordability of the proposed CSO controls and Paterson's ability to finance them.

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16 NACWA press release: Coronavirus Impacting Clean Water Agencies; Local Utilities and Ratepayers Need Assistance March 20, 2020

Most of the costs of a municipal wastewater system are relatively fixed within broad operating ranges. Debt service and other capital costs are fixed once incurred. Some operating costs are somewhat variable with wastewater flows, e.g. chemical and electrical power usage but this variability is lessened by the reality that inflow, infiltration and stormwater flow in a combined system are not affected by billed water consumption. Labor costs are not directly variable, e.g. a twenty percent reduction in billed flow would not result in a need for twenty percent less labor. Maintenance costs might go down somewhat as equipment operating times may be reduced.

As costs do not decline proportionately to billed flow, it can be expected that user charge rates must be raised to generate sufficient revenue to sustain current operations. The relationship between changes in costs and revenues and the resultant changes in user charge rates is complex and has not yet been fully analyzed. At this point it can be assumed that user rate increases may be necessary to simply maintain current operations, and these rate increases will likely erode the financial capability of Paterson to fund the CSO LTCP.

7.2 Potential Median Household Income Impacts

The impacts of the pandemic on median household incomes in Paterson cannot be determined at this point. Historical analogies may provide some useful, albeit disturbing, context but are not presented as predictive:

- U.S. median household income fell by 6.2% from $53,000 in 2007 to $49,000 in 2010. In New Jersey, the MHI decreased by around 4.0% for the same period.[17]
- The U.S. unemployment rates rose from 5.0% in December of 2007 to 9.9% in December of 2009.[18]
- Data on impacts of the Great Depression on median household income are not available. As a proxy, the personal income per capita data are available. For 1929 this was $700. By 1933 this figure bottomed out at $376, a decline of 46%. Unemployment for the same period rose from around 3.0% to 25%.[19]

While a quantifiable assessment of the impact of the pandemic on median household income is not feasible at this time, reduction in base year MHI can be expected. This will further exacerbate the impacts of the revenue reductions described above on LTCP affordability, as higher base user charge rates will absorb an increased portion of lower MHI.

7.3 Implications for the Long Term CSO Control Program

Paterson anticipates that the financial implications of the COVID-19 pandemic will be discussed with NJDEP during the review of the SIAR and as the 2021 – 2025 NJPDES permit is developed. Based on the October 1, 2020 revised due date for the SIAR, additional revenue data should be available to support a more specific refinement of this analysis in the SIAR.

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17 Source: Fact Sheet: Income and Poverty Across the States, 2010 Joint Economic Committee, United States Congress, Senator Robert P. Casey, Jr. Chairman.

18 Source: Bureau of Labor Statistics data series LNS1400000

19 Source: Federal Reserve Economic Data (FRED) data series: A792RC0A052NBEA

Given the current and likely continuing uncertainties as to the New Jersey and national economic conditions, Paterson will be reticent to commit to long term capital expenditures for CSO controls without the incorporation of adaptive management provisions, including provisions to revise and reschedule the long term CSO controls proposed in this SIAR based on emergent economic conditions beyond Paterson's control. As detailed in Section F of Paterson's SIAR these provisions could include scheduling the implementation of specific CSO control measures to occur during the five year NJPDES permit cycles. A revised affordability assessment should occur be performed during review of the next NJPDES permit to identify controls that are financially feasible during that next permit period.

8.0 Conclusion

The 1997 EPA guidance indicates that ratepayers and permittees who are highly burdened future expenditures added to their current wastewater treatment, conveyance, and collection costs can be allowed 15 years to complete capital projects to handle CSOs. In extreme cases, the guidance suggested longer compliance schedules might be negotiated.[20] Paterson is proposing a 40-year implementation schedule.

The affordability analysis detailed above has documented that the selected $122 million (current dollars) Municipal Control Alternative along with related operation and maintenance costs would result in a 2.0% Residential Indicator which is at the threshold of a "high burden" under EPA's criteria. Moreover, the reality of the high poverty rates, low household incomes compared to the rest of New Jersey and nationally and the high costs of living in Paterson strongly support that the EPA metric understates the impacts of the CSO control costs on the residents of Paterson. As evidenced by its New Jersey Municipal Revitalization Index score in the top 99th percentile Paterson's capacity to implement the CSO controls proposed in the SIAR is limited without considerable scheduling flexibility and external funding assistance.

[20] Combined Sewer Overflows – Guidance for Financial Capability Assessment and Schedule Development, EPA 832-B-97-004, Page 46.

Appendix

PVSC LTCP Affordability Model

Inputs and Assumptions

City of Paterson

	Item	Value	Notes / Sources
1	**Finance**		
2	Bond Interest Rate		
3	Market	6.00%	Bond Buyer 20 bond (Revenue Bonds) rolling average interest rate 1986 - 2015
4	NJDEP	0.00%	NJ Environmental Infrastructure Financing Program - Smart Growth program offers 75% funding at 0% interest and 25% funding at market rates for 20 years for CSO control projects.
5	Interest Rate Blend		
6	Market	25%	
7	NJDEP	75%	
8	Blended Interest Rate	1.50%	
9	Bond Term	20	
10	Target Coverage	125.00%	Input - to be discussed and revised
11	O&M as % of Capital Cost	2.0%	General estimate for CSO controls - To be revised with the development of control alternative cost estimates.
12	**Economic**		
13	Inflation On or Off	**ON**	
14	Collection System O&M Inflation		
15	NACWA or Local Data	NACWA	NACWA 2011 National Survey
16	3.9%	3.9%	
17	PVSC Service Charge Inflation		
18	NACWA or Local Data	PVSC	PVSC Expenditures 2014 (audit) - 2016 (budget)
19		2.7%	
20	Capital Improvement Inflation	3.7%	Based on the 1984 - 2015 ENR Construction Cost Indices for New York City (80%) and Philadelphia (20%)
21	Estimate Base Year	2016	
22			
23	**Demographic**		
24	Census Households	44,329	Census (American Fact Finder)
25	Residential Connections	18,339	FCA Worksheet 1 line 108 from Paterson.
30	Median Household Income		
31	Base Year MHI	$36,106	2013 - 2017 American Community Survey Five Year Estimate - adjusted to 2017 by US Census
32	Base Year		
33	Income Growth	0.07%	Annualized rate of change in MHI 1999 - 2014 (US Census)
34		0.00%	
32			
33	**Current Municipal System Costs & Revenues**		
34	Costs		
35	Payments to PVSC	$11,578,651	SFY 2017 Municipal Data Sheet - Sheet 20 (General Appropriations)
36	Collection System Costs	Need to discuss these	

	Item	Value	Notes / Sources
37	Division of Sewer Collection		
38	Salaries & Wages	$165,296	SFY 2017 Municipal Data Sheet - Sheet 15 (Current Fund Appropriations)
39	Other Expenses	$28,358	
40	Subtotal	$193,654	
41	Division of Water & Sewers		
42	Salaries & Wages	$440,723	SFY 2017 Municipal Data Sheet - Sheet 15C (Current Fund Appropriations)
43	Other Expenses	$488,943	
44	Estimated Sewer Share	50%	
45		$464,833	
46	Sewer Repairs	$12,600	
47	Subtotal	$477,433	
48	Total Sewer Operations & Maintenance	$671,087	
49	Existing Debt Service Costs	$4,322,404	FCA Worksheet 1 line 101 from Paterson
50	Other		
51	Total Collection System Costs	$16,572,143	Existing O&M + Existing Debt Service
52			
53	Last Year Existing Debt	2036	Placeholder
54			
55	2017 Revenues		
56	Rates & Charges	$10,220,300	SFY 2017 Municipal Data Sheet - Sheet 4a (General Revenues)
57	Other (Prior Year's Sewer Charges)	$1,162,961	
58	Total	$11,383,262	
59			
60	**Current Cost per Residential Connection**		
61	Service Charge (annualized)		
62	Unit Cost	$56.00	City of Paterson Code Section 407-19
63	Billing Frequency	Quarterly	
64	Annual Cost	$224.00	
65	Commodity Charge		
66	Unit Cost	(per 100 cubic ft.)	
67	Municipal Collection System	$0.75	Annex to City of Paterson Code Section 407-19
68	PVSC		
69	Total	$0.75	
70	Typical Household Consumption (gallons)	4,500	
71	Billing Units	ccf	
72	Billing Frequency	Quarterly	
73	Billing Volume	6.02	Convert gallons (row 65) to hundred cubic feet.
74	Annual Cost	$18.0	451.1%
75	Total Annual per Typical Household	$242.0	
76			
77	**Future Capital Costs & Scheduling**		
78	CSO Control Costs		

	Item	Value	Notes / Sources
79	Estimated Capital Costs (millions)	$0.0	Input - LTCP capital costs that trigger a 2.0% residential indicator one year after full implementation.
80	Percent Pay-As-You-Go	0%	
81	Cost Estimate Year	2019	Base year for cost estimates.
82	Start Date	2021	Per NJPDES due date for LTCP in 2020
83	Planning Duration (years)	1	Input
84	Design Duration (years)	3	Input
85	Construction Duration (years)	17	Input
86	Total	21	
87	Capital Cost Breakout		
88	Planning	2%	Based on the old USEPA Construction Grants Program regulations (40 CFR 35 appendix A, which used ASCE cost curves.
89	Design	5%	
90	Construction	93%	
91	Total	100%	
98			