

# Assessing the Affordability of Water and Sewer Utility Costs in New Jersey

Phase 1 Report: Methodology Review and Preliminary Assessment

A Project of New Jersey Future for Jersey Water Works

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Thanks also to the Asset Management and Finance Committee of Jersey Water Works, which reviewed and provided input regarding the methodology used in this report.

The methodology, data, estimates and evaluations in this report were prepared in an effort to help frame future discussion of affordability policies and programs and reflect available information and concepts as of the report's development. The authors and New Jersey Future request that any perceived errors in data or analytical technique be brought to our attention for review and potential correction.

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## Overview

This report reviews various methods that have been or could be used to evaluate the household affordability of drinking water and sewer utility costs in New Jersey. It provides a preliminary assessment of household financial stress using these methods, based on recent household income levels and estimated utility costs (2017/2018 rates) for households using 60,000 gallons per year as a common demand level. The report makes preliminary findings on household affordability based on the analyses and provides policy recommendations and ideas for additional research. This Phase 1 report was developed to provide background information for use by the Jersey Water Works collaborative and policy makers in selecting a consensus method for affordability analysis that can be used to establish baseline data for New Jersey communities.

When the full project is completed, it will inform the statewide discussion of water services affordability, including the following:

- Determining whether new legislation or regulations are needed to address affordability; and
- Selecting the most appropriate public interventions, if any are deemed necessary.

To our knowledge, this project and report mark the first time that utility rates and household income statistics at the utility level have been compiled in New Jersey, providing a solid foundation for detailed analysis. While the project team attempted to ensure correct utility cost information, new information is being collected continuously. Any corrected cost estimates since the draft report are reflected in Appendix B through the date of this report, but the methodology analyses are based on the initial cost estimates due to time and budget limitations. A review indicates that any changes do not alter the fundamental conclusions, though the statistical analyses would change slightly. Therefore, the report results should be considered indicators of issues, not definitive results. The updated information can be used for assessment of a consensus method for affordability analysis.

Drinking water and sewer utility costs have been rising faster than the Consumer Price Index for decades, and in recent years have also been rising faster than median household income. As they increase, these costs impose greater stress on household finances (for those who pay water utility costs directly or indirectly), and on government and social support programs for low-income and no-income households. At the same time, from the perspective of the utilities, existing rates may be too low to generate sufficient revenues to operate, maintain and repair the system properly. Both kinds of financial stress – upon ratepayers and utilities – will be exacerbated by the need to upgrade aging and inadequate utilities and meet current and future federal and state mandates.

These regulatory mandates include implementation of the Water Quality Accountability Act, adopted in 2017 and applicable to drinking water utilities, and of asset management requirements from the New Jersey Department of Environmental Protection (NJDEP) for sewer utilities, within the combined sewer overflow (CSO) permits of 21 municipalities and several regional treatment utilities, including implementation of the CSO Long Term Control Plans (LTCPs). Over the next two to three decades New Jersey is facing major capital project costs, likely in the tens of billions of dollars, for treatment plants, water distribution and sewage collection systems, and combined sewer overflow controls. Even with improved technology, management and financing, costs are likely to rise. The result is that low-income

households and those of modest means will increasingly be stressed financially by increasing water and sewer rates.

Affordability has become a nationally recognized issue that can have profound impacts on the administrative and political process of rate-setting. These household stresses can lead to lower utility revenues as households fall behind on payments while retaining cash for other essential expenditures such as food and housing costs. Eventually the household stresses should be expected to increase the potential for loss of housing. Utilities then face costs for pursuing payment, turning off services and replacing lost revenues, all of which put additional pressure on rates. This cycle of increasing rates driving increasing nonpayment that then drives increased rates has been noted in other states. The implications of this issue for New Jersey are many and critical. If utilities cannot raise their rates without harming many households, political forces will oppose or restrict rate increases and thus force utilities to delay infrastructure investments, resulting in a continued decline in services.

For this reason, Jersey Water Works has highlighted affordability as a major concern. Jersey Water Works is a collaborative effort among a wide spectrum of organizations, utilities, agencies, experts, community groups and others. The purpose of Jersey Water Works is to “transform New Jersey’s inadequate water infrastructure through sustainable, cost-effective solutions that provide communities with clean water and waterways; healthier, safer neighborhoods; local jobs; flood and climate resilience; and economic growth.”<sup>1</sup> As part of this effort, the Steering Committee of Jersey Water Works has adopted two goals to ensure that utilities have adequate revenues and that ratepayers can afford utility costs:

- **Adequate and Fair Revenue.** Utilities and local governments raise the funds required to make appropriate capital investments and ensure proper operation and maintenance in a cost-effective equitable manner that treats ratepayers fairly. Programs are authorized and established to ensure affordability. Stormwater utilities and stormwater fees are authorized statewide and widely implemented.
- **Affordable Combined Sewer Overflow (CSO) Solutions.** CSO LTCPs help ensure affordability for all ratepayers by using cost-effective overflow-reduction strategies, state and federal funding assistance, equitable rate structures, innovative financing mechanisms, appropriate implementation schedules and leveraging of other public and private investments.

New Jersey Future, which serves as the backbone staff for Jersey Water Works, has collaborated with researchers from Rutgers University to assess the household financial stresses of costs for drinking water and sewer utilities. (This study included drinking water utilities with water treatment plants and those with only distribution systems and sewer utilities with treatment plants and those with only collection systems.) As part of this evaluation, we used methods for calculating affordability from a number of sources, as there is no national or state consensus, law or uniform standard for affordability that applies at the household level. This report is an initial step toward measurement of progress regarding the Jersey Water Works goals by establishing baseline measures for the following:

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<sup>1</sup> See <http://www.jerseywaterworks.org/>

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- Drinking water and sewer utility affordability for residential users.
- Level of financial stress facing water utilities, based on the fiscal capacity of ratepayers.

This report provides an initial assessment of affordability calculation methods, levels of household stress using a variety of affordability indicators, ideas for improving the analysis through additional research, and a discussion of policy implications for the development of affordability programs. The technical methods are described within the report and appendix and are not addressed in this summary.

The report provides information for development by Jersey Water Works of a consensus assessment method for household affordability, and potentially of one or more thresholds. That consensus assessment will be developed through the second phase of the project, as guidance for municipal, utility authority, utility and State efforts to improve affordability assistance. The next step is to develop a white paper assessing the relative utility of affordability assessment methods, with recommendations for at least two alternative methods for consideration. The white paper would then be considered by a panel of experts, practitioners and representatives for affected parties, with the objective of developing a consensus. Phase 2 of the project will be complete when the methodology is used to provide a baseline assessment of household affordability.

### Major Findings

Common practice nationally has been to use U.S. Environmental Protection Agency (USEPA) thresholds to determine whether household affordability issues are significant, where the utility rates are compared to median household income for the full utility service area. These thresholds were developed to determine the financial stability of the water utility itself when faced with upcoming capital and operational costs due to regulatory mandates.<sup>2</sup> The derivation of the thresholds is not well documented and there are ongoing discussions as to whether they remain appropriate. Nevertheless, the USEPA thresholds remain a simple, commonly used methodology for assessing utility financial stress. No consensus exists regarding an alternative metric or threshold for utility financial stress, though USEPA reportedly has started a long-term process to consider changes.

When applied at the utility level, this report shows a wide range of rates for individual water and sewer utilities around New Jersey. Almost no utilities in New Jersey exceed USEPA's thresholds for affordability from the utility's perspective.

The USEPA thresholds were not created to assess household affordability issues, even though many utilities and governments have used them for that purpose. More recent literature (discussed in this report) and an advisory panel chartered by Congress<sup>3</sup> emphasize that this approach has significant problems. Again, no consensus exists regarding an alternative metric or threshold for household financial stress, though several have been proposed and are assessed in this report. For this reason, we

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<sup>2</sup> As stated by the Environmental Finance Center at the University of North Carolina (UNC-EFC), these thresholds address the "capacity of a community to pay for water services in general and to pay for services that will see cost increases due to regulatory requirements". Daniel Irvin, 2017.08.31, "Is Percent MHI the Best Way to Measure Affordability?" [efc.web.unc.edu/2017/08/31/percent-mhi-best-way-measure-affordability/](http://efc.web.unc.edu/2017/08/31/percent-mhi-best-way-measure-affordability/)

<sup>3</sup> National Academy of Public Administration. 2017. Developing a New Framework for Community Affordability of Clean Water Services. Washington, DC. This report is available from: [https://www.napawash.org/uploads/Academy\\_Studies/NAPA\\_EPA\\_FINAL\\_REPORT\\_110117.pdf](https://www.napawash.org/uploads/Academy_Studies/NAPA_EPA_FINAL_REPORT_110117.pdf)

applied the USEPA thresholds for households as a point of comparison to the other household-level methods.

Applying the USEPA thresholds at the household level, we find many households could already face utility costs that stress their finances. Our research clearly shows that affordability problems using this approach are not limited to a few areas, but rather exist across a wide array of utilities and vary tremendously by location within the service areas of many utilities.

The other methods evaluated in this report compare household drinking water and sewer utility costs to other income metrics, such as poverty-level income (and multiples thereof), minimum wage, household disposable income, and the United Way ALICE income thresholds. No method is entirely satisfactory as a metric for household affordability, but many provide valuable insights on affordability that the USEPA thresholds cannot. Further, the various methods do reinforce the concept that income variations within the utility service are more important than utility-level income metrics such as median household income as used by USEPA. The next section provides a more complete summary of the various methods.

The analyses for this report show that many of the state's medium and large utilities have service areas with relatively high median incomes, where higher-income households could reasonably aid households with higher utility cost burdens, without an excessive burden on the ratepayers. However, other utilities of this size have such a high concentration of affordability problems that they will need support from outside the utility. In addition, the vast majority of water and sewer utilities in New Jersey are small to very small; the administrative costs of establishing affordability programs could exceed the total cash outlay to help eligible households. Such inefficiencies are problematic, but the only options would be either to exempt small utilities or develop large-scale (e.g., statewide) programs that benefit the customers of small utilities without need for utility involvement.

### Summary of Methods and Results

To assess household affordability, this report compares estimated household water and sewer costs to estimated household incomes. Utility rate information was collected in 2017 and 2018 for more than 400 utilities. Information from the U.S. Bureau of the Census was used to estimate multiple levels of household income for various geographic areas, from the census tract to regions.

This report made several simplifying assumptions to allow for completion in a reasonable time and within a limited budget. Most important are:

- The use of a **nominal household water demand of 60,000 gallons per year**. Actual household water demands will vary based on household size and water demand patterns. Cost estimates were developed also for smaller demands (45,000, 30,000 and 15,000 gallons; see [Appendix B](#)), but this report focuses on one demand level.
- That **each household pays its water and sewer bills directly**. In reality, many households pay their water and sewer costs indirectly, through rent; for example, nearly 40 percent of New Jersey residents served by drinking water utilities live in multi-family rental properties. Other households are subsidized by federal and state affordable housing programs that pay for or cap utility costs. In addition, at least 60 municipalities have no separate residential sewer charge at all, but rather cover sewer costs through the municipal budget using property tax revenues. In

addition, the costs of stormwater management are currently reflected in municipal budgets and therefore cannot be addressed in this report.

- That **all households are charged under the residential rate components** of the utility billing system. In reality, some multi-family units are charged through a master meter as commercial enterprises or a separate category of residential rates.

Therefore, this report provides a sense of what a nominal household would pay, and the affordability stresses it would experience, if in fact it paid all of its water and sewer utility bills directly. The affordability issues identified in this report could be seen as a rough estimate of the maximum affordability issues at the current time, with the actual need for affordability programs somewhat less due to existing affordable housing programs. However, it is important to note that affordable housing programs are in constant flux, continued federal funding is not ensured, and the water and sewer rates used in this report are mostly from 2017 and do not reflect potential increases in future years.

Several methods were tested to assess their usefulness in understanding affordability issues in New Jersey. None of the methods is perfect and all require policy decisions as to the most relevant, appropriate and financially acceptable thresholds.

- **USEPA Thresholds: Utility Level**

The USEPA provides guidance for states on how to assess whether utilities will have the financial capacity to meet capital expenditure needs associated with Safe Drinking Water Act and Clean Water Act compliance. One component is the Residential Indicator, which compares average household utility costs to median household income for the entire utility service area; the threshold is 2 percent for water and either 2 percent or 2.5 percent for sewer, and 4 percent or 4.5 percent for both. We used the Residential Indicator method to assess utility financial stresses. Of 159 water utilities and 290 sewer utilities for which rates were collected, only one of the water utilities exceeded the 2 percent threshold and only two sewer utilities met or exceeded that threshold.

- **USEPA Thresholds: Household Analysis**

While the USEPA guidance was not developed or intended for use at the household level and has many methodological problems for use in that way, it has been used for that purpose by some utilities and researchers in the absence of other consensus or regulatory approaches. This report uses a hybrid approach. We applied the USEPA thresholds to the estimated income of individual households, rather than to just the median household income, to assess affordability. Applying the USEPA thresholds to household incomes provides a very different picture than the utility-level analysis. Statewide, more than 15 percent of households within the water utility and the sewer utility service areas each exceeded the 2 percent threshold, representing nearly 400,000 households for water and nearly 300,000 household for sewer.<sup>4</sup> Nearly every county has at least 5 percent of its households currently paying more than 2 percent for water, 2 percent for sewer, and 4 percent for both water and sewer. The most burdened counties at the 4 percent combined level are Essex (26.1 percent of households), Hudson (22.1 percent of households) and Camden (21.7 percent of households), all of which are highly urbanized counties with older cities. At the municipal level, 21 municipalities have more than 25 percent of their households paying more than 4 percent, with eight having 30 percent or more of their

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<sup>4</sup> These numbers would increase with collection of rate information from additional utilities.

households exceeding that threshold; within municipalities the range of results is even more extreme. Figures 8 through 12 in the Results section provide a visual representation of these results.

It is important to recognize that this use of the USEPA thresholds is controversial. This report provides the analysis as a point of comparison to other methods, not an endorsement of its use.

- **Affordability Ratio Method**

One method from the literature (Teodoro, 2018) compares the combined water and sewer costs to an estimate of disposable household income (total income minus necessary expenses) at the 20<sup>th</sup> percentile income level (i.e., where 20 percent of households earn less and 80 percent earn more) to derive an Affordability Ratio; Teodoro suggests a 10 percent threshold as reasonable but acknowledges that this threshold is preliminary. The analytical method for determining disposable household income in the various regions of New Jersey was too complex for completion through this report, and so we used his estimates for New Jersey (statewide), New York City and Philadelphia as points of comparison. As water and sewer utility boundaries do not match in many areas of New Jersey, we assessed utility costs separately rather than in combination, using a 5 percent Affordability Ratio method for each. Results are provided for all sewer and water utilities for which rate information was collected, and then separately for the largest 37 water utilities that, in combination, serve 80 percent of all New Jersey residents that have public water service.

The Affordability Ratios at the median sewer utility and water utility costs are greater than 5 percent each using the New York City and Philadelphia estimates of disposable income, and therefore the combined median rates would exceed 10 percent. New Jersey statewide results are much lower, at roughly 2.5 percent each, due to the much higher statewide disposable income levels. The results for individual utilities vary considerably. The maximum results are high for both sewer and water utilities overall, but much less so for the largest 37 water utilities, indicating that the worst results occur in a few of the smaller utilities, which affect far fewer people.

- **Minimum Wage Comparisons**

As a complementary approach to the Affordability Ratio method, Teodoro (2018) suggests a comparison of water and sewer utility costs to the statutory minimum wage (\$8.60 in New Jersey); he suggests a threshold of 8 hours per month, or 96 hours per year, but again acknowledges that this threshold is preliminary. We compared household utility costs to current New Jersey minimum wage and also to the much-discussed \$15.00-per-hour minimum wage; results are provided for all sewer and water utilities for which rate information was collected, and then separately for the largest 37 water utilities.

A household would need to work nearly 8 minimum wage hours per month (93 hours per year), almost the threshold suggested by Teodoro, to pay the median annual costs for sewer and water utilities combined. Again, results differ greatly among utilities, with the maximum combined household costs for sewer and water far exceeding the 96 hours per year threshold. The median hours needed for the largest 37 water utilities are higher than the median for all water utilities, but the maximum hours needed are far lower, again indicating that the largest affordability stress are in a few of the smaller systems. A \$15.00-per-hour minimum wage would reduce all of these results by more than 40 percent.

- **Poverty Level Comparisons**

Many governmental programs use national poverty levels or some multiplier of this level as a threshold for providing assistance to individuals or households. For example, Philadelphia recently adopted a water utility affordability program (including water, sewer and stormwater<sup>5</sup> costs) that cap utility charges at 2.5 percent of household income for households up to the national poverty level, and 3 percent for incomes up to 150 percent of the poverty level. Therefore, we compared household utility costs to 100 percent, 125 percent, 150 percent and 175 percent of the national poverty level. As with the Affordability Ratio method, results are provided for all sewer and water utilities for which rate information was collected, and then separately for the largest 37 water utilities.

As with other analyses, results vary considerably among utilities. Most utilities do not exceed the Philadelphia threshold of 2.5 percent of the poverty level. However, 26 sewer utilities and six water utilities exceed that threshold at the national poverty level. For the most part, the 26 sewer utilities are either very small facilities or collection systems contributing to regional treatment facilities, including some major municipalities such as Newark, East Orange and Gloucester City; Camden City is just below this threshold. The six water utilities are all relatively small municipal systems.

- **United Way ALICE Household Survival Budget Comparisons**

The United Way organizations in New Jersey and 14 other states have calculated, by county, budgets for one-person and four-person households that would provide a modest lifestyle and no savings, which they call the ALICE (Asset Limited, Income Constrained, Employed) Household Survival Budget. Water and sewer costs are assumed to be part of rental housing rates. We compared sewer and water utility costs to the relevant ALICE Household Survival Budget for the county most closely associated with each utility.

Depending on the county, median combined water and sewer costs represent roughly 5 percent to 6 percent of housing costs in the budget, or 1 percent to 1.5 percent of the total budget. Again, the maximum combined water and sewer rates were significantly higher. The ALICE budgets could be used to establish a threshold percentage for water and sewer utility costs, where affordability programs would assist households as their costs exceed that percentage. However, this approach has not been explored previously and would require additional analysis to make it workable, as the ALICE budgets are constructed for comparative purposes, rather than reflecting actual household incomes.

### Policy Implications

Affordability of water and sewer utility costs is part of the broader question about quality of life for households of modest means or less. Ideally, no one portion of household costs would be addressed independently of broader household finances. However, the nature of utility costs is that they are addressed through programs associated with the specific utility sector. Therefore, New Jersey will need to confront and answer the question of how to mitigate affordability problems associated with water and sewer utility costs.

Ultimately, affordability can be a major policy or even political constraint for utilities that must raise additional revenue to meet federal and state standards and industry norms for treatment and

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<sup>5</sup> Philadelphia has a stormwater utility fee; currently no similar stormwater utility fees exist in New Jersey.

infrastructure management. The more households that can't pay for existing rates, the more backlash will ensue regarding proposed rate increases. Conversely, affordability programs can also be a major tool to ensure that ratepayers are not overburdened relative to their income, imparting a sense of fairness to the rate system that will encourage setting of appropriate overall rates, sufficient to meet regulatory and system management needs, while providing assurance that cost-burdened households can receive support.

For these reasons, New Jersey needs to address the affordability issue before it becomes even more critical. Affordability concerns can be mitigated in part through more cost-effective utility operations that reduce the need for rate increases, water conservation assistance that reduces volume-based charges, and rate designs that ensure equitable treatment of low-volume users. Utilities should take these actions regardless of affordability concerns, but especially where rates are causing affordability problems. However, even with these efforts, affordability concerns will remain and are likely to increase.

No national consensus exists on what level of household financial stress should be considered excessive, but other programs and ideas from the literature provide a starting point for discussion. In the final analysis, New Jersey's answer will involve analysis combined with policy decisions on what constitutes an intolerable burden on households, and what program costs are considered reasonable. This report provides an initial basis for discussion of these issues.

There is no "right answer" regarding the thresholds for affordability. As in most policy debates, the focus will be on how to ensure that those most in need can be helped without making the program costs so high as to destroy public support for the system. New Jersey could consider two major options:

1. **Utility Approach:** While investor-owned utilities have some ability to incorporate the costs of affordability programs in their rate structure, new legislation could allow or require individual utilities to develop a mechanism for reducing the bills for low-income households to long-term affordable levels, thus creating utility-specific affordability programs. This approach requires a change in legislation,<sup>6</sup> as currently there are only a few exceptions to the statutory requirements that all customers are charged uniformly relative to their customer class (e.g., residential vs. commercial) and usage. Utilities would need guidance and clear standards. As noted above, the administrative costs of establishing these programs would be excessive for the hundreds of small utilities, and so some portion of the customer population would not be addressed.
2. **Statewide Approach:** New Jersey could develop a statewide program similar to that for energy, where a small surcharge on all bills (or other funding source) funds a statewide affordability program so that individual utilities do not need to establish their own programs. One advantage to a statewide program is that only one affordability approach is needed, rather than potentially hundreds. Another advantage is that individual utilities would not need to take on a function for which they are unprepared, and which may be well outside of their current expertise.

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<sup>6</sup> Senate Bill 276, approved by the New Jersey Senate on June 21, 2018, and referred to the Assembly, is an example of this approach, applied to single-family or two-family units where the owner or a tenant pays the utility bill directly to a government-owned utility.

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For both options, the focus is on long-term affordability, as distinct from emergency situations where a ratepayer is unable to pay bills due to temporary financial problems.

Another policy implication concerns state funding support for water and sewer utilities. Low-interest loans and grants are provided by the government-subsidized State Revolving Fund programs, couched in part in arguments that this lowers the costs for ratepayers compared to market financing of capital projects. However, financial support of this sort for utilities helps reduce costs for all ratepayers of that utility, regardless of their ability to pay, and so even those who could readily afford higher rates will also benefit from this subsidy. As affordability increases as a problem, and becomes a constraint on appropriate rate-setting, New Jersey could consider focusing its financial support for utilities on affordability for stressed households rather than for general rates. Doing so will improve the financial viability of the utility, which will receive more revenue from stressed households, and will greatly reduce the impact of higher rates on those least able to afford them.

## Driving Factors for Development of the Report

Drinking water and sewer utility costs have been rising faster than the Consumer Price Index for decades, and in recent years have also been rising faster than median household income. As they increase, these costs impose greater stress on household finances (for those who pay water utility costs directly or indirectly) or on government and social support programs for low-income and no-income households. At the same time, from the perspective of the utilities, rates may be too low to generate adequate revenues to properly upgrade and operate and maintain the system. Both kinds of financial stress--facing ratepayers and facing utilities--will be exacerbated by the need to upgrade aging and inadequate water systems. Affordability is becoming a nationally-recognized issue that can have profound impacts on the administrative and political process of rate-setting. However, no consensus exists regarding the most appropriate metric or threshold for assessing household affordability, and no general program exists at the state or federal level for addressing the affordability issue.

### Jersey Water Works Focus

Jersey Water Works is a collaborative effort of many diverse organizations and individuals<sup>7</sup> who embrace the common purpose of transforming New Jersey's inadequate water infrastructure by investing in sustainable, cost-effective solutions that provide communities with clean water and waterways; healthier, safer neighborhoods; local jobs; flood and climate resilience; and economic growth. Jersey Water Works has adopted goals to ensure that utilities have adequate revenues and that ratepayers can afford them:

- **Adequate and Fair Revenue.** Utilities and local governments raise the funds required to make appropriate capital investments and ensure proper operation and maintenance in a cost-effective equitable manner that treats ratepayers fairly. Programs are authorized and established to ensure affordability. Stormwater utilities and stormwater fees are authorized statewide and widely implemented.
- **Affordable Combined Sewer Overflow (CSO) Solutions.** CSO LTCPs help ensure affordability for all ratepayers by using cost-effective overflow-reduction strategies, state and federal funding assistance, equitable rate structures, innovative financing mechanisms, appropriate implementation schedules and leveraging of other public and private investments.

### Project Purpose

The purpose of this research project is to help measure progress towards these goals by assessing baseline measures for the following:

- Level of financial stress facing water utilities, based on the fiscal capacity of ratepayers.
- Drinking water and sewer utility affordability for residential users.

This report discusses several different methods of assessing residential financial stress rates, using U.S. Environmental Protection Agency (USEPA) guidance as a starting point (due to their familiarity and applicability to utility viability) and then comparing those results to alternative analytical approaches from the literature. The report provides baseline information regarding the level and geographic distribution of household financial stress from water and sewer utility rates, using methods that can

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<sup>7</sup> For additional information, see <http://www.jerseywaterworks.org/about-the-collaborative/members/>.

readily be updated in future years. It also helps inform the potential development of more robust financial assistance approaches.

The report has direct policy implications. Water and sewer utilities are fundamental support infrastructure for our urbanized society, along with energy and transportation. Whether water and sewer costs are affordable will affect the level of acceptance or rejection of utility rates necessary to ensure proper long-term maintenance and upkeep of the systems. Utilities with large percentages of stressed households may find that raising rates also increase the rate of nonpayment, which in turn will require higher rates. Utilities may find that they cannot raise rates sufficiently to maintain compliance with state and federal requirements and to ensure continuing function of their utility systems. This kind of lose-lose scenario has already affected other cities in the nation. New Jersey will need to address the problem before it becomes a critical constraint to water and sewer utility management.

This report supports Phase 2 development by Jersey Water Works of a consensus assessment method and threshold(s) for household affordability, as guidance for municipal, utility authority, utility and State efforts to improve affordability assistance. A white paper will be developed that assesses the relative utility of affordability assessment methods, with recommendations for at least two alternative methods for consideration. The white paper would then be considered by a panel of experts, practitioners and representatives for affected parties, with the objective of developing a consensus. Phase 2 of the project will be complete when the methodology is used to provide a baseline assessment of household affordability in New Jersey.

## Key Issues of Affordability

### Defining Affordability

Affordability is a topic often discussed but lacking an adequately rigorous definition. Affordability addresses the question of whether a household can afford to pay for specific necessities (i.e., fixed costs that are not discretionary without substantial loss of quality of life), not whether it is willing to pay. Public policy addresses issues of household affordability regarding housing, energy, medical care, food, education and many other purposes, including the focus of this report on water and sewer utilities. The U.S. Environmental Protection Agency (USEPA) and others have recognized that thorough understanding of affordability must incorporate consideration of all necessary (i.e., non-discretionary) household costs. The problem is that affordability for any single cost category is inseparable from all other cost categories. Affordability in a correct sense involves a comparison of household income (including aid) to the costs of all necessary expenditures, including long-term costs such as retirement and unanticipated expenditures such as medical emergencies.

The primary difficulty with this expansive approach to affordability is that laws and programs are generally focused on individual cost components. Housing programs do not necessarily address the affordability of medical care, and vice versa. The result is that the affordability of each cost component is often viewed in isolation, as a necessary step in developing programs for that cost component.

Ancillary difficulties are many, including:

- Information is often lacking on total household costs.
- Household costs vary by household size and composition, location, housing type, etc.
- Affordability can differ between otherwise similar households due to differences in accumulated wealth (equity, savings and investments), and how close each household is to foreseeable future events, such as retirement.
- The various household cost components shift over time, and often not in parallel, making the tracking of affordability difficult.

The complexity of measuring affordability has resulted in the use of simplified indicators, such as a housing-burdened household being defined as one that spends greater than 30% of average income on housing and directly-related costs, such as energy. For water and sewer utilities, one commonly-used metric is the cost of utility services as a percentage of median household income for that utility's service area. This metric from the USEPA<sup>8</sup> was originally created to help determine whether the combination of normal operation and maintenance costs (O&M), debt service from prior projects, and new capital costs would exceed a utility's ability to secure revenue based on the stress of utility costs upon the general community. Such simplified indicators are increasingly being challenged, in part because far more information is available for use in computer-based analysis than was true 20 years ago. The need to assess affordability relative to household (rather than just utility) financial stresses has demonstrated the inadequacy of the original metrics for this new purpose.

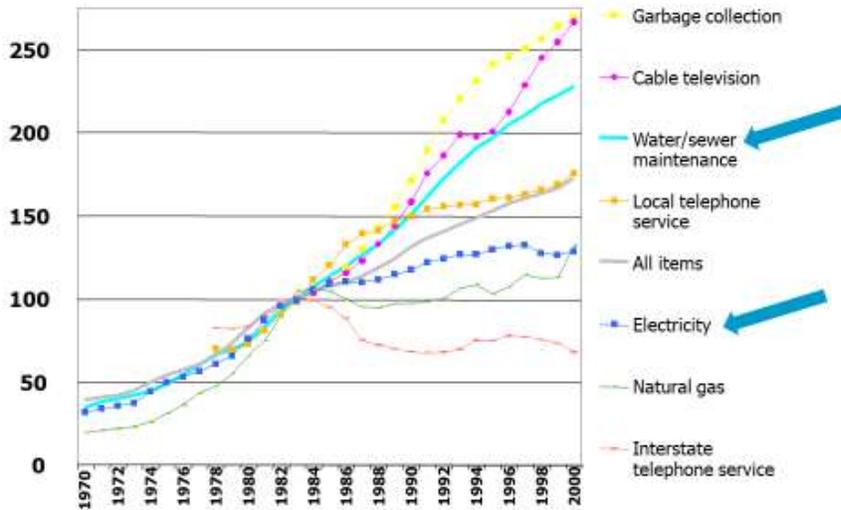
### Water and Sewer Cost Trends

Nationally, the average water and sewer costs trended very close to the national rate of inflation (i.e., no change in cost in "constant dollars" based on Consumer Price Index) through the 1970s and very

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<sup>8</sup> USEPA. 1998. Information for States on Developing Affordability Criteria for Drinking Water. EPA 816-R-98-002.

early 1980s, according to USEPA. As seen in **Figure 1**, From the mid-1980s through 2000, water and sewer costs exceeded the CPI by roughly 50%, likely reflecting the increased costs for compliance with the Safe Drinking Water Act and the Clean Water Act.

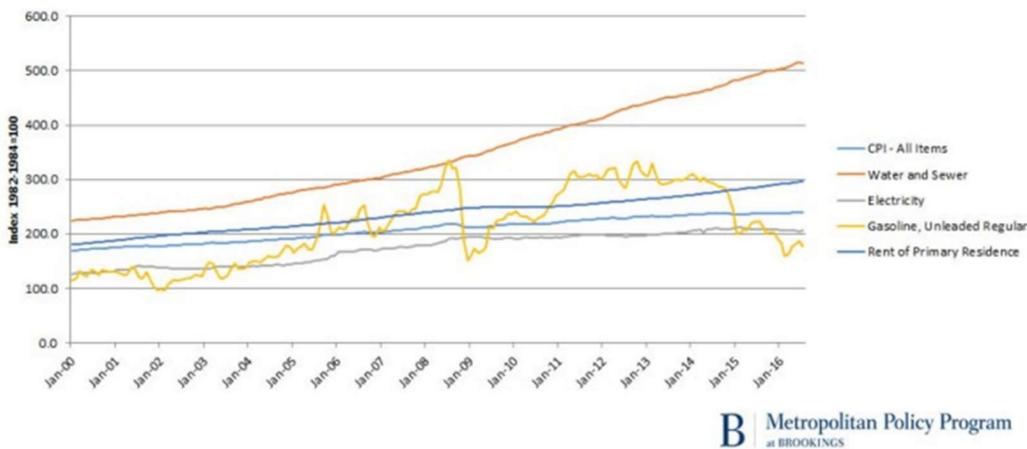


Source: USEPA

Figure 1: Water and Sewer Utility Costs Comparison to Inflation, 1970-2000

According to the Brookings Institute, this pattern continued through 2016 (**Figure 2**). A major concern at the national and state level is that much of the water and sewer utility infrastructure is approaching, has reached or has significantly exceeded its economic life span, meaning that it will be more cost-effective to rehabilitate or replace the infrastructure than to continue using it, with the increasing likelihood of failure and emergency repair costs. The expectation is that many water and sewer utilities will need to increase rates to address these needs, though it is recognized that some capital improvements can actually reduce long-term (i.e., lifecycle) costs.

**Increase in Monthly Price of Water and Sewer Services, Consumer Price Index, 2000 to 2016**



Metropolitan Policy Program at BROOKINGS

Source: Brookings analysis of Consumer Price Index (CPI) data, seasonally adjusted. Note that water and sewer costs refer to the "water and sewerage maintenance" category, as defined in the CPI.

Figure 2: Water and Sewer Utility Costs Comparison to Inflation, 2000-2016

### Utility Cost Implications for Utility Finances

For these reasons, what was once a minor household cost, nearly irrelevant to questions of affordability, either has become or will become a significant component of household costs for low-income households. Detroit provides a case in point, when it threatened in recent years to cut off service to tens of thousands of customers due to nonpayment.

Unaffordable rates have direct impacts on utility revenue. One of the major concerns raised is that unaffordable utility costs do not generate revenue, as households go into arrears on their utility bills rather than foregoing other, more critical (in their viewpoint) costs. For example, a report for Food and Water Watch by Roger Colton of Fisher, Sheehan & Colton, a Massachusetts economics analysis firm, assessed water and sewer affordability issues in the city of Baltimore. According to Colton (2017), “One of the problems facing the City of Baltimore is that sending bills that exceed the capacity of the community to pay does not result in the revenue that is required to meet one’s financial obligations. As a result, a downward spiral is created. Future rate increases have to be higher, in order to take into account the fact that much of the increase in billed revenue, in fact, will not be collected.”<sup>9</sup> He notes that total water and sewer revenue received increased nearly 90% and 700%, respectively, from 2010 to 2016, but arrearages (i.e., “non-current asset receivables”, defined as those receivables that the City does not expect to collect within one year) increased far faster, at 154% and 1400%, respectively.

Utilities are finding that they need to address affordability issues, and that doing so can actually increase revenue as households attempt to pay a portion of their utility bills in combination with aid programs, rather than giving up and paying nothing at all.

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<sup>9</sup> Colton, Roger. 2017. Baltimore’s Conundrum: Charging for Water/Wastewater Services that Community Residents Cannot Afford to Pay. Fisher, Sheehan & Colton, for Food and Water Watch.  
[https://www.foodandwaterwatch.org/sites/default/files/baltimore\\_water\\_study-final\\_report-2017.pdf](https://www.foodandwaterwatch.org/sites/default/files/baltimore_water_study-final_report-2017.pdf)

## Potential Affordability Metrics

Over the last 30 years, USEPA has engaged advisory panels and others to examine how to address the ability of utilities to afford compliance costs with the Clean Water Act and the Safe Drinking Water Act. States use this guidance to determine their own approaches to this issue. Researchers have used the USEPA guidance as a surrogate threshold for household affordability, as have some utilities in the development of ratepayer assistance programs, though the USEPA guidance was not originally intended for that purpose. Other researchers and utilities have offered alternative approaches to assessing household affordability. One city, Philadelphia has developed a ratepayer assistance program with explicit thresholds for affordability.

### USEPA Guidance on Utility Affordability Criteria

The 1996 Amendments to the Safe Drinking Water Act recognized utility affordability concerns and required that USEPA develop guidance for states regarding this issue, especially for small systems. The primary purpose of the guidance was to determine which systems lacked financial capacity to address SDWA compliance using normal technological and schedule requirements, resulting in permission to either use alternative technology (within limitations) or a longer compliance schedule with SDWA requirements. Affordability is one of three criteria to establish priorities for assistance from the Drinking Water State Revolving Fund. The USEPA guidance notes that “a community’s ability-to-pay can be thought of in terms of the aggregation of household ability-to-pay...Affordability is often assessed at the water system level in terms of the capacity of the systems (or the communities that operate them) to finance system capital improvements and operations.” (USEPA, 1998, p.10)

The USEPA guidance is not evaluated here. Rather, the focus here is on the metric used in one part of the evaluation method, where the Total Annual User Charge (AUC) is divided by the Annual Median Household Income (MHI) for the utility, yielding a percentage (Household Affordability, aka Residential Indicator). Based on prior practice, USEPA applies a threshold of 2% as a threshold for drinking water utilities (USEPA, 1998, Appendix D). For sewer utilities, USEPA relies on guidance from 1997, using the Residential Indicator approach (AUC as a percent of MHI), with a level of greater than 2% indicating a high financial impact for the utility, and a level of 1% to 2% indicating a mid-range financial impact.<sup>10</sup> However, subsequent guidance notes that the Residential Indicator percentage is a continuum,<sup>11</sup> where for example a level of 1.99 is not substantially different from a level of 2.01 despite being below and above the threshold.

Mack and Wrase (2017)<sup>12</sup> note that USEPA suggests no more than 4.5% of median household income for the combination of water and sewer utility costs; they conducted a national study of water and sewer utility costs relative to median household income using a water demand of 12,000 gallons per month for a four-person household based on USEPA estimates of average household uses; this is 144,000 gallons

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<sup>10</sup> USEPA. 1997. Combined Sewer Overflows-Guidance for Financial Capability Assessment and Schedule Development. EPA 832-B-97-004.

<sup>11</sup> USEPA. 2014. Financial Capability Assessment Framework for Municipal Clean Water Act Requirements. Memorandum from Ken Kopocis and Cynthia Giles, 24 November 2014. This guidance expanded applicability of the 1997 guidance to all Clean Water Act requirements affecting a utility or its municipal owner, not just CSOs.

<sup>12</sup> Mack EA, Wrase S. 2017. A Burgeoning Crisis? A Nationwide Assessment of the Geography of Water Affordability in the United States. PLoS ONE 12(1): e0169488.doi:10.1371/ journal.pone.0169488

per year (nearly 100 gallons) per capita, well in excess of recent estimates for New Jersey users. Individual utilities can use per capita or per household demands calculated using customer data.<sup>13</sup>

### Application of USEPA Guidance to Households

It should be noted that USEPA developed the Residential Indicator to help identify utilities that would struggle financially to achieve compliance with SDWA and CWA mandates; the method was not developed for use to identify and certainly not to assist households that would be financially stressed by utility costs. However, utilities have used the same thresholds to define affordability within their service areas and to target assistance to financially-stressed household.

### Affordability Relative to Disposable Income

In response to concerns that USEPA's Residential Indicator approach is not appropriate to address household affordability issues, Dr. Manuel Teodoro of Texas A&M suggests two different approaches for identify issues regarding household affordability.<sup>14</sup> The first is called the Affordability Ratio (AR), the "ratio of **basic water and sewer costs** to **disposable household income** for **low-income customers**."

The focus, as noted, is on low-income households rather than the median household income, given that the greatest likelihood of affordability issues will be in low-income households, here defined as the income at the 20<sup>th</sup> percentile household income for the utility.

Basic water and sewer costs are estimated using 50 gpcd (gallons per capita per day) times the number of people in a household (e.g., for a four-person household, the result would be 73,000 gallons per year). This usage rate was developed for a national study, including areas from humid to arid. Other options have been recommended for household demands, which could be used in lieu of 50 gpcd. For example, Chenoweth (2008)<sup>15</sup> recommends 135 liters (35.66 gallons) per capita per day for basic water services (e.g., for a four-person household, the result would be roughly 52,000 gallons per year).

The AR is applicable to individual households and requires determination of "essential household expenses" (other than water and sewer costs) using the Consumer Expenditure Survey (CEX) from the U.S. Bureau of Labor Statistics. Essential household expenses are subtracted from household income to determine disposable household income. Teodoro (2018) includes estimates of disposable monthly income at the 20<sup>th</sup> percentile household income level (four-person households) for 25 cities. The 20<sup>th</sup> percentile and annual disposable incomes were calculated for New York City (\$18,085 and \$6,948) and Philadelphia (\$13,546 and \$6,288); in both cases the disposable incomes are far below the average for all 25 cities of \$9,360. For comparison, New Jersey's 20<sup>th</sup> percentile household income is \$28,300,<sup>16</sup> much higher than New York City or Philadelphia. Teodoro (personal communication) provided statewide results for New Jersey, with a 20<sup>th</sup> percentile and annual disposable income of \$28,548 and \$17,180, respectively. However, it is worth noting that the 20<sup>th</sup> percentile household income for

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<sup>13</sup> For a methodology to calculate per capita demands, see Van Abs et al. 2018. Water Needs through 2040 for New Jersey Public Community Water Supply Systems. Rutgers University.

<sup>14</sup> Teodoro, M. 2018. Measuring Household Affordability for Water and Sewer Utilities. Journal of the American Water Works Association. January 2018, 110:1, pp. 13-24.

<sup>15</sup> Chenoweth J. 2008. Minimum water requirement for social and economic development. *Desalination* 229 (2008) 245–256

<sup>16</sup> Statistical Atlas. Household Income in New Jersey. Accessed 2018.05.29, <https://statisticalatlas.com/state/New-Jersey/Household-Income>

Camden City is \$9,200.<sup>17</sup> These differences indicate the importance of addressing regional differences in household income and essential household expenses.

According to Teodoro (2018), one drawback to the method is that “estimating disposable household income in a given community requires a level of effort and/or technical sophistication greater than what is required of the conventional method.” A second is that AR measures relative costs but does not define affordability. Similar to the USEPA method, the results are on a continuum but for affordability programs a decision is still needed regarding the appropriate threshold for what is affordable and what is not, or how to taper affordability aid as the AR declines from high to low for a utility. He suggests a 10% threshold as a reasonable guide, but recognizes that additional discussion is needed on threshold determination.

For New York City and Philadelphia, the AR values were calculated at 14.1% and 11.2%, respectively; both are above the recommended 10% threshold, and they are slightly higher and nearly equivalent to the 11.4% average for all 25 cities.

### Affordability Relative to Minimum Wage

The second approach from Teodoro (2018) divides the water and sewer costs for a household by the minimum wage for that area to determine the number of minimum wage hours necessary to cover those costs. Again, basic water and sewer costs are estimated using 50 gpcd (gallons per capita per day). As with the AR approach, no threshold of affordability is intrinsically correct; he recommends 8 hours as the maximum number of minimum wage hours necessary to afford monthly utility bills, or 96 hours annually. For New York City and Philadelphia, the results are 6.8 and 8.1 hours, both of which are at or below that threshold. Teodoro suggests that the two approaches be used in tandem, so in both cases New York City and Philadelphia would exceed the threshold for AR, but New York City (which has a higher minimum wage at \$12.00 per hour as of the study) would not exceed the threshold for minimum wage hours, while Philadelphia (at \$7.25 per hour) would be at the threshold. The New Jersey minimum wage reached \$8.60 per hour as of 1 January 2018.

### Affordability Relative to Low Income Thresholds

Another possible metric is to use specific income thresholds. When incomes are very low, such as at or below poverty thresholds or the 20<sup>th</sup> percentile household incomes, the assumption is that these households have no capacity for additional nondiscretionary expenditures. While it is reasonable to assume that these households should have some responsibility for paying water and sewer utility costs, their ability to do so is very limited.

A major problem is assessing what percentage of the poverty threshold is appropriate for a household to pay, above which would be considered unaffordable. **Table 1** shows the Census Bureau values for the national level, for households of up to four people with two children. The two adult/two child level is \$24,339 for 2016; this household size is the assumed household size used in this report to assess affordability, but it should be recognized that many households have fewer than four people, only one adult (or only one income), etc. Further, there is concern that the national poverty level is based on a dated methodology that should be significant updated to reflect modern lifestyles and needs.

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<sup>17</sup> Statistical Atlas. Household Income in New Jersey. Accessed 2018.05.29, <https://statisticalatlas.com/place/New-Jersey/Camden/Household-Income>

**Table 1. Poverty Thresholds for 2016 by Size of Family Including Related Children Under 18 Years**  
(U.S. Bureau of the Census)

Size of family unit	Weighted average thresholds	Related children under 18 years		
		None	One	Two
• One person (unrelated individual):	\$12,228			
Under age 65	\$12,486	\$12,486		
Aged 65 and older	\$11,511	\$11,511		
• Two people:	\$15,569			
Householder under age 65	\$16,151	\$16,072	\$16,543	
Householder aged 65 and older	\$14,522	\$14,507	\$16,480	
• Three people	\$19,105	\$18,774	\$19,318	\$19,337
• Four people	\$24,563	\$24,755	\$25,160	<b>\$24,339</b>

The Baltimore affordability assessment by Colton (2017) used census tracts, rather than the entire utility service area, “to estimate how much residents at different income levels in different areas would pay for water bills in coming years.”<sup>18</sup> Colton used the 2% threshold but applied it to the combined water and sewer charges, not a 4% to 4.5% threshold for both. The report does not explain why the 2% threshold was applied to the combined charges. He applied this 2% threshold to the median household income, the 20<sup>th</sup> percentile household income, and to 100% and 150% of the federal poverty level as points of comparison.

Mack and Wrase (2017) note that other countries use an approach of water utility costs relative to household income, with the United Kingdom and the United Nations Development Program using a threshold of 3% of household income, and 3-5% for the Organisation for Economic Co-operation and Development (OECD).

New Jersey has a higher cost of living than the nation as a whole. Estimates differ, but various sources have suggested that New Jersey’s cost of living exceeds the national average by:

- 12.24% (from City Rating based on a comparison of the Consumer Price Index for New Jersey and the average U.S. city CPI, <https://www.cityrating.com/cost-of-living/new-jersey/>)
- 14% (from NJ.com reporting in 2015 on a study by 24/7 Wall St., [http://www.nj.com/inside-jersey/index.ssf/2015/03/the\\_high\\_cost\\_of\\_jersey\\_why\\_we\\_go.html](http://www.nj.com/inside-jersey/index.ssf/2015/03/the_high_cost_of_jersey_why_we_go.html))
- 26.6% (from Sperling’s Best Places, with no information on the derivation of this number [http://www.bestplaces.net/cost\\_of\\_living/state/new\\_jersey](http://www.bestplaces.net/cost_of_living/state/new_jersey))

Cost of living will also vary within New Jersey, and various web sites provide cost-of-living information for various cities.

#### Example Assistance Programs: Philadelphia and Washington, DC

In 2015, Philadelphia adopted an ordinance to establish an “Income-Based Water Rate Assistance Program.”<sup>19</sup> This approach charges utility costs to low-income customers based on their income, not

<sup>18</sup> Duncan, Ian. 2017.12.15. As Baltimore Council weighs tackling high water bills, study shows how much customers are squeezed. The Baltimore Sun, <http://www.baltimoresun.com/news/maryland/baltimore-city/bs-md-ci-water-cost-study-20171215-story.html>

<sup>19</sup> City of Philadelphia. 2015. Chapter 19-1600 of The Philadelphia Code

their water usage. According to Walton (2017), the resulting Tiered Assistance Program (TAP) “sets monthly water bills as a percent of income. A household making zero to 50% of the poverty line will pay 2% of monthly income for the water department bill, which includes water, sewer and stormwater charges. A household between 51% and 100% of the poverty line will pay 2.5% of monthly income; a household between 101% and 150% will pay 3%. The minimum bill will be \$12 per month. These percentages are lower than the U.S. Environmental Protection Agency’s affordability threshold of 4.5% of income for a combined water and sewer bill. TAP households will not be charged based on consumption, but the water department will monitor for unusually high use. Those households will get free low-flow fixtures, leak detection tests, and information about how to conserve water.”<sup>20</sup>

The District of Columbia Water and Sewer Authority (DC Water) has a Customer Assistance Program (CAP), which is administered by the District of Columbia’s Department of Energy and Environment (DOEE). CAP provides eligible customers with a discount of up to 400 cubic feet of water and up to 400 cubic feet of sewer services per month (currently equivalent to \$37.00 per month in aggregate), plus a 50 percent credit on the Clean Rivers Impervious Area Charge (CRIAC).<sup>21</sup> The DOEE determines eligibility on the basis of federal low-income guidelines, using maximum incomes relative to household size, in FY2018 ranging from \$30,142 for a one-person household to \$57,965 for a four-person household and \$79,992 for an eight-person household.<sup>22</sup>

### Comparison to Energy Affordability Programs

On a related utility affordability issue, APPRISE (2006) conducted a study for the NJ Board of Public Utilities on its Universal Service Fund (USF),<sup>23</sup> which applies to households with an income at or below 175% of the federal poverty level. The threshold for an ‘affordable’ bill is defined as a bill not exceeding 3% of income for each utility bill (e.g., heating energy, non-heating electricity), which equates to 6% for an all-electric household. Eligible households comprise 20% of all New Jersey households, based on the USF income threshold.

Of interest is the discussion of thresholds used by other states. As examples, they note that Ohio uses higher thresholds of 5% for electric baseload usage and 10% for gas heating. The key point is that no “magic number” exists for affordability thresholds. There is no intrinsic reason why energy costs should be considered a greater or lesser burden on household budgets than water and sewer costs – an extra dollar spent on utilities is not available for other necessities, regardless of what utility gets that dollar.

### Affordability Relative to United Way ALICE Budgets

United Way organizations have collaborated to develop a metric, the Household Survival Budget, for fourteen states including New Jersey. This budget is considered sufficient for a household to “afford the basic expenses of housing, child care, food, transportation, and health care.”<sup>24</sup> United Way then

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<sup>20</sup> Walton, Brett. 2017. Philadelphia Water Rate Links Payments to Household Income. Circle of Blue.

<http://www.circleofblue.org/2017/water-management/pricing/philadelphia-water-rate-links-payments-household-income/>

<sup>21</sup> DC Water, <https://dcwater.com/customer-assistance>

<sup>22</sup> District of Columbia, <https://doee.dc.gov/node/9402>

<sup>23</sup> APPRISE. 2006. Impact Evaluation and Concurrent Process Evaluation of the New Jersey Universal Service Fund. Prepared for the New Jersey Board of Public Utilities. <http://www.appriseinc.org/reports/NJ%20USF%202006.pdf>

<sup>24</sup> United Way. 2016. ALICE Study of Financial Hardship: New Jersey. [https://www.dropbox.com/s/dav760qjudecw36/16UW%20ALICE%20Report\\_NJUpdate\\_Lowres\\_12.13.16.pdf?dl=0](https://www.dropbox.com/s/dav760qjudecw36/16UW%20ALICE%20Report_NJUpdate_Lowres_12.13.16.pdf?dl=0)

compares this metric to household incomes to determine how many households can be considered ALICE households (Asset Limited, Income Constrained, Employed). These are the households with incomes between the national poverty income and the Household Survival Budget. A second budget, the Household Stability Budget, reflects improved housing, child care, food, transportation, and health care, and it adds cell phone costs and modest savings (10% of the budget) to the Household Survival Budget. The Household Stability Budget was not used in this report.

The United Way 2016 NJ ALICE Report states, “In 2014, the average annual Household Survival Budget for a New Jersey family of four (two adults with one infant and one preschooler) ranged from \$55,164 in Hudson County to \$81,168 in Hunterdon County – well above the U.S. family poverty rate of \$23,850.” (United Way, 2016.) (Note: The equivalent 2016 poverty level is \$24,424 per the Census Bureau.) United Way estimates that 26% of New Jersey households fit the ALICE definition. These households are therefore too well-off to be below the federal poverty level (another 11% of households) but not well-enough off to have significant discretionary income. In total, 37% (1.2 million) households were either ALICE or below the national poverty level. The United Way report for New Jersey notes that the Household Survival Budget increased 23% between 2007 and 2014 (with a 66% increase in health care costs), well above the national inflation rate of 14%.

The basic assumption of ALICE households is that they face significant choices in the allocation of their budgets, where increases in one component will require decreases in another. The ALICE methodology is therefore a variation on the concepts from Teodoro (2018), but unlike that method has not been applied nationally. On the other hand, the ALICE method has been applied in four biennial assessments to New Jersey from 2012 to 2018 (the 2018 report has been announced but was not posted as of 24 May 2018), and it has been applied at the county level for two different household sizes. As such, the ALICE methodology and results can provide a valuable indication of households that face serious financial constraints as utility (and other) costs increase, and because it has been assessed at a smaller geographic level than the metropolitan areas used by Teodoro, may be more valuable for New Jersey use. The statewide Household Survival Budget is shown in **Table 2**.

**Table 2. Household Survival Budget Monthly Costs, New Jersey Average, 2014**  
(United Way, 2016)

Monthly Cost Categories	SINGLE ADULT	2 ADULTS, 1 INFANT, 1 PRESCHOOLER	2007 – 2014 PERCENT INCREASE
Housing	\$898	\$1,257	15%
Child care	\$–	\$1,374	16%
Food	\$202	\$612	20%
Transportation	\$289	\$565	36%
Health care	\$139	\$557	66%
Miscellaneous	\$184	\$486	22%
Taxes	\$313	\$497	25%
Monthly Total	\$2,025	\$5,348	23%
ANNUAL TOTAL	\$24,300	\$64,176	23%
Hourly Wage*	\$12.15	\$32.10	23%

The ALICE report also includes Household Survival Budgets by county, as shown in **Table 3**. The budget for a family of four is in the \$60,000’s range for 14 counties. Two counties, Somerset and Hunterdon, are much higher at over \$80,000 and Ocean is \$72,000, while four counties are under \$60,000. All four

of the last group are highly urbanized counties: Essex, Hudson, Passaic and Union, where the most striking difference from the middle group is lower transportation costs.

**Table 3. Household Survival Budget Annual Costs by County, 2014**  
(United Way, 2016)

County	Single Adult	2 Adults, 1 Infant, 1 Preschooler	County	Single Adult	2 Adults, 1 Infant, 1 Preschooler
Atlantic	\$24,288	\$65,040	Middlesex	\$21,492	\$62,280
Bergen	\$24,420	\$63,672	Monmouth	\$25,356	\$66,660
Burlington	\$24,420	\$66,360	Morris	\$27,228	\$69,012
Camden	\$24,420	\$64,428	Ocean	\$25,356	\$72,192
Cape May	\$21,084	\$66,324	Passaic	\$24,420	\$55,980
Cumberland	\$23,604	\$65,604	Salem	\$24,420	\$65,436
Essex	\$23,136	\$55,788	Somerset	\$25,560	\$80,088
Gloucester	\$24,420	\$66,276	Sussex	\$27,228	\$69,708
Hudson	\$22,572	\$55,164	Union	\$23,136	\$56,400
Hunterdon	\$25,560	\$81,168	Warren	\$21,792	\$63,420
Mercer	\$26,220	\$67,332			

### Addressing Differences in Household Size and Structure

Household sizes differ greatly, with many single-person households, single-adult or multi-adult households with or without children, households with one or multiple wage earners, etc. This report does not attempt to determine affordability for all possible combinations and permutations, though water and sewer utility costs were determined for the equivalent of households using 15,000, 30,000, 45,000 and 60,000 gallons of water use per year. More detailed analyses would be appropriate at the utility or municipality level prior to establishment of local or statewide affordability programs, so that appropriate estimates can be developed of the size and structure of such programs. Aid to individual households would be tailored to the size and income structure of each household.

### Addressing Differences in Income Distributions

As discussed above, one of the major concerns about using the median household income (MHI) as a point of comparison is that the household incomes below the MHI may not be evenly distributed. To test that concern, ten water and ten sewer utilities with the lowest MHIs were evaluated to determine the percentage of their households with incomes below \$24,999; this level is the top of the lowest three Census Bureau income ranges (with top levels of \$9,999, \$14,999 and \$24,999) and was chosen because it approximates the 2016 national poverty rate of \$24,339. As can be seen in **Table 4** and **Table 5**, utilities with MHIs that are very close can have very different percentages of their households in these low-income brackets.

For example, the Pinelands Water Company and Orange Water Department have MHIs of \$34,939 and \$36,170, but percent of low-income households of 25.7% and 35.8%, respectively. The latter figures indicate a very different pattern of household income distributions. For sewer utilities, a similar distinction is seen between the first four utilities and the fifth, Pinelands Wastewater Company, and between Buena Borough MUA and Homestead Treatment Utility. The latter two have very comparable MHIs but very different percentages of low-income households, at 27.0% and 16.3%, respectively.

**Table 4. Household Incomes Below \$24,999 Relative to Median Household Income for Ten Water Utilities with the Lowest Estimated Median Household Income**

<b>Water Utility Name</b>	<b>Estimated # of HHs in water service area</b>	<b>Estimated MHI</b>	<b>% of HH with HHI of \$0 to &lt;\$24,999</b>
Camden City Water Department	15,261	\$23,414	52.8%
Atlantic City MUA - Class R-1	13,847	\$27,482	47.1%
Salem Water Department	2,141	\$27,841	45.9%
Cedar Glen Lakes Water Company	957	\$29,973	40.7%
Manchester Twp Water Utilities - Western	7,666	\$31,429	39.6%
Cedar Glen Homes Inc.	338	\$31,457	37.1%
Newark Water Department	92,522	\$33,739	39.1%
Lakewood Township MUA	2,012	\$34,825	29.8%
Pinelands Water Company	1,959	\$34,939	25.7%
Orange Water Department	11,584	\$36,170	35.8%

HH = Households. MHI = Median Household Income. HHI = Median Household Income

**Table 5. Household incomes Below \$24,999 Relative to Median Household Income for Ten Sewer Utilities with the Lowest Estimated Median Household Income**

<b>Sewer Utility Name</b>	<b>Estimated # of HHs in sewer service area</b>	<b>Estimated MHI</b>	<b>% of HH with HHI of \$0 to &lt;\$24,999</b>
Salem City WW Treatment Facility	2,622	\$32,811	39.8%
Penns Grove Sewerage Authority	1,689	\$34,283	36.0%
Trenton Sewer Utility	26,735	\$34,628	39.1%
Asbury Park WTP	6,531	\$36,668	36.9%
Pinelands Wastewater Company	2,096	\$38,489	24.2%
Cumberland County Utilities Authority	9,359	\$46,577	29.3%
Landis Sewerage Authority	18,496	\$48,355	26.6%
North Hudson Sewerage Authority	25,115	\$48,646	28.2%
Buena Borough MUA	2,861	\$49,100	27.0%
Homestead Treatment Utility	1,177	\$50,043	16.3%

HH = Households. MHI = Median Household Income. HHI = Median Household Income

Looking at the examples more closely, **Figure 3** shows clear distinctions between the income distributions for the pairs of utilities. The percentage of households below the \$24,999 level in Buena Borough MUA is far higher than for Homestead Treatment Utility, while the reverse is true for the next two income ranges, leading to nearly equal MHIs but far different results below the national poverty level. The situation is similar but even more concentrated for Orange Water Department and Pinelands Water Company, as Orange Water Department has households concentrated in the bottom two income ranges, not just the bottom three. These results emphasize the need to recognize limitations in use of the median household income for assessment of either utility affordability or household affordability.

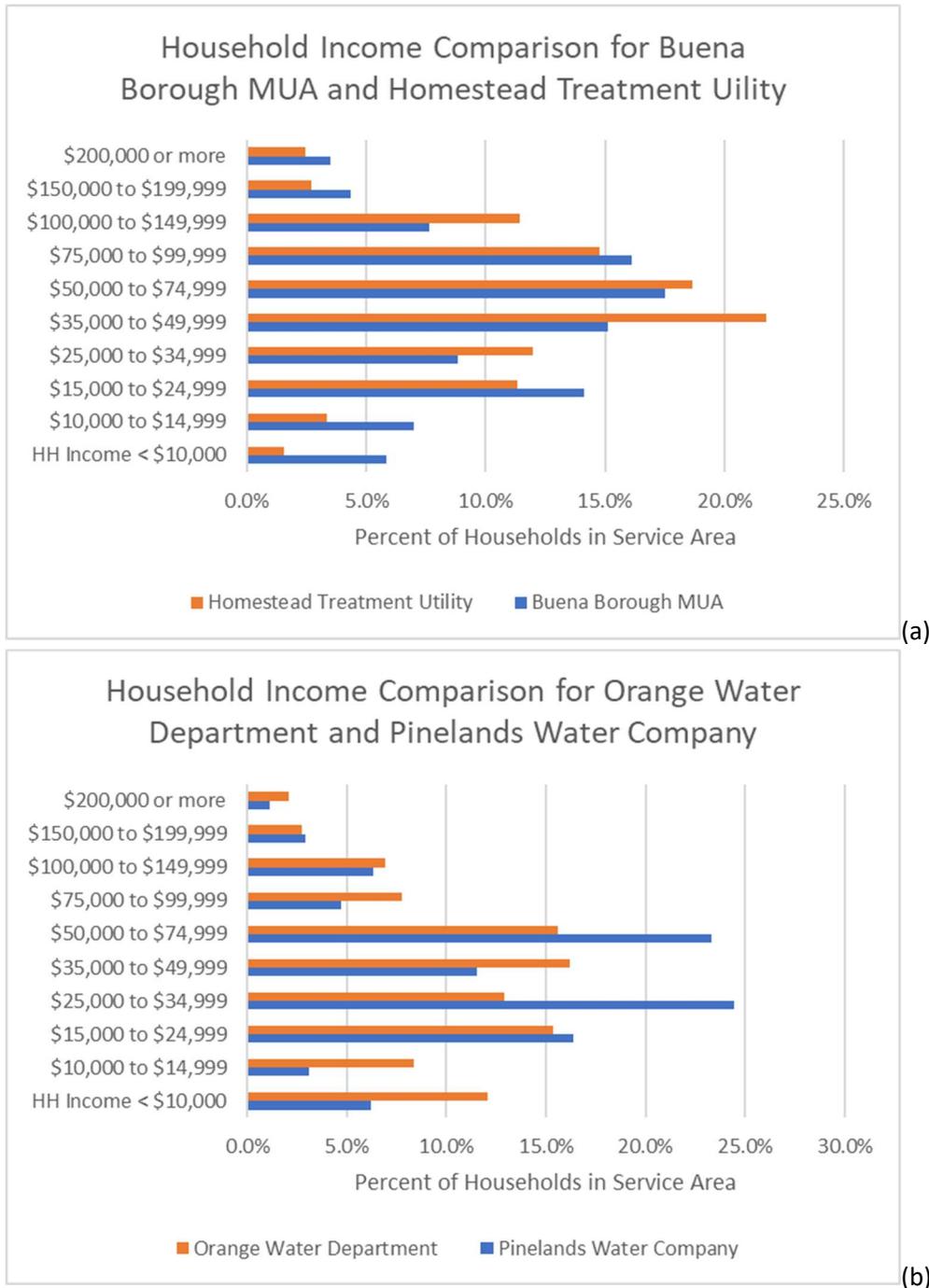


Figure 3: Comparison of Household Income Distributions for Selected Sewer (a) and Water (b) Utilities

### Addressing Non-metered and Subsidized Households

The literature frequently notes that a major impediment to assessing affordability of water and sewer rates is that many households do not pay utility costs directly or in full (an issue that also exists for electricity and natural gas energy). Many multi-family units lack submetering for allocation of water costs, and households there may pay all water and sewer utility costs through their rent. For example, across all drinking water utilities for which information was available, an estimated 61.5% of housing units are owner-occupied, 38.5% are renter-occupied multi-family properties, and the remainder are

renter-occupied single-family homes. More than 30 water utilities have a majority of households in renter-occupied multi-family properties, with three (the New Brunswick, Orange and Newark Water Departments) exceeding 75%. Some of these rental units and their households may be partially or entirely subsidized, including water and sewer costs, through state or federal housing programs. In some municipalities (including more than 60 in New Jersey), part or all of the sewer costs are funded through the ad valorem property tax rather than by ratepayers. For this reason, this report estimates what households would pay if they were charged for the full cost. As with household size and income, more detailed analyses would be needed prior to establishment of local or statewide affordability programs.

### Conclusions Regarding Measures of Affordability

There are many ways of measuring how much of a household's total income goes to water and sewer utility costs, to provide a sense of budget stress relative to other household needs. The problem is that no consensus exists on what level of household budget stress makes utility costs unaffordable. Indeed, each household will see the stress differently, based on whether they have existing or foreseeable financial stresses for other needs, such as high prescription drug costs, anticipated needs for a new vehicle, a child in college, etc. Unfortunately, large-scale programs cannot be so flexible as to address each household as a unique case. Affordability programs must rely on thresholds, procedures and budgets that will only go so far.

The thresholds that will be selected will inevitably reflect a "best judgement" approach that addresses the most critical affordability needs of a selected group of utility customers. There is no basis for deciding, for example, that 10% is "right" or "wrong" relative to 9% or 11%. This report provides a variety of evaluations to help decision-makers decide, by showing how different methods either result in generally consistent results or provide very different perspectives on affordability.

## Report Methodology

There are two major ways of looking at affordability. One is to look at the ability of a water utility to generate sufficient revenue from its user base to support proper operation, maintenance and capital projects, including any necessary upgrades to meet regulatory requirements. This perspective is the appropriate use of USEPA's thresholds. The second is to assess the ability of households to pay water utility rates (drinking water and sewer) without excessive financial stress. This report provides results on both perspectives of affordability.

- **Utility Focus** – The water and sewer utility rates are compared to the estimated median household income (MHI) for the utility's service area, using the "residential indicator" component of USEPA thresholds for utility fiscal viability. (Note: This report does not assess the "financial indicator" component, which is not relevant to household affordability.)
- **Household Focus** – Water and sewer utility rates are assessed relative to various measures of household affordability and household sizes/water uses, individually and in combination, based on household income level by census tract, as associated with the appropriate utilities. This information can be aggregated for the individual utilities and to municipal, county and state levels, but generally not to the combined utility level as most water and sewer utilities have different service area boundaries.

The initial assumption in both cases is that residential customers at all income ranges are directly responsible for their water utility bills; in actuality, some residential customers do not pay a utility bill either because the utility costs are incorporated into municipal property taxes (especially for sewers) or the utility costs are paid directly by another entity (e.g., landlord, household financial assistance program). This baseline assumption provides a sense of the total number of households that might need assistance to avoid financial stress from water utility charges. Some of these households already receive financial assistance (e.g., Section 8 housing vouchers) while others do not. By assessing the overall number of households within each utility service area and statewide that would be financially-stressed by water and sewer utility charges, efforts can then focus on determining how much of the assistance need is already met, and how to address the unmet need.

A second assumption is that households use 60,000 gallons per year, an amount equating to just over 40 gallons per capital per day (GPCD) for a four-person household, or 63 gpcd for households at New Jersey's 2010 average of 2.61 people per household.<sup>25</sup> Actual per capita demands for higher-density development in New Jersey are generally between these two values (Van Abs, et al, 2018).<sup>26</sup> Utility costs were also calculated for other water demand levels, but the 60,000 gallons per year per household is used in this report. The water demand level is important, as some utilities charge by usage alone,

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<sup>25</sup> While actual household demands will vary by household size, housing density and geographic area, recent research by Rutgers (Van Abs, et al., 2018) indicates that an average of 60,000 gallons per household per year across the full utility service area is a reasonable estimate for this purpose, when addressing larger utilities such as those studied in this project. A household demand of 60,000 gallons per year equates to just over 40 gallons per capital per day (GPCD) for a four-person household, or 63 gpcd for households at New Jersey's 2010 average of 2.61 people per household. Urban households in New Jersey, which would have limited outdoor demands, have per capita demands of roughly 42 to 58 gpcd; this range is comparable to the 60,000 gallons per year used here.

<sup>26</sup> Van Abs, Daniel, Jiayi Ding and Eric Pierson. 2018. Water Needs through 2040 for New Jersey Public Community Water Supply Systems. Rutgers University, New Brunswick, NJ.

while others have a fixed quarterly charge plus a volume-based charge. Volume-based charges may be the same for all volumes, but more often increase with the volume used. Therefore, household water costs are rarely linear; as water demands decrease, costs per thousand gallons may be greater for some utilities (i.e., those with higher quarterly charges) than for others (i.e., those with low rates for households using little water).

Analysis of affordability requires information on residential water and sewer utility rates, household costs at various water usage levels, household income, and household expenses other than water utilities. Water and sewer utility rates are not compiled by any state agency, and therefore were compiled by Rutgers as a snapshot (2017 and early 2018). Rate information was collected where available. Over 60 municipalities incorporate sewerage costs within the ad valorem property tax, a few municipalities do likewise for water utility costs, and some municipalities did not provide information on their rate schedule. Estimated household utility costs were determined by multiplying the rates times several different water usage levels. The methodology and results for the utility rates and household costs at 60,000, 45,000, 30,000 and 15,000 gallons are provided in [Appendix B](#).

Household income (HHI) and household expense information are available through federal agencies; we used the most recent income data available, from the 2012-2016 five-year ACS (American Community Survey), which provides a close approximation to current income and expenses. Because the utility rate information and household income information are not from the same years, the analyses may slightly overstate or understate the affordability issues; rates often increase from year to year, and household income also varies from year to year. The following information was compiled for this report.

#### Water Supply Utility Rates and Household Costs

Drinking water utility residential rates were compiled where available for all major water systems, defined as areas served by utilities with total average water demand of greater than 5 million gallons per day (MGD), plus all areas served by combined sewers if not otherwise included. In addition, information was collected for all moderate systems (greater than 2 MGD), and a random sample of small systems. In total, rates were collected for 172 water systems, representing roughly 90% of all water utility customers in New Jersey.<sup>27</sup> (Note that some systems have multiple rate zones, which were collected separately and included with the 172 systems.) These systems were identified using NJDEP data on system capacities and service areas. Each system delivering water to customers has a public water system permit from NJDEP, allowing ready identification of the specific utility. The project budget did not allow for collection of rate information for all utilities, and some public utilities refused to provide rate information without an OPRA filing. No further rate collection efforts are anticipated for this Phase 1 report due to budgetary constraints.

**NOTE:** Every effort was made to ensure that the utility rates and costs (see [Appendix B](#)) are correct, but errors may exist. Any necessary corrections should be brought to the attention of the primary author.

The collected rates were used to estimate annual household costs for 60,000, 45,000, 30,000 and 15,000 gallons per year (reflecting primarily indoor water demands and varying household sizes so that the sensitivity of costs relative to demands could be assessed). Annual household costs varied from over \$900 to less than \$100, assuming 60,000 gallons of water demand.

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<sup>27</sup> Approximately 90% of all New Jersey residents are served by drinking water utilities, and 10% have domestic wells serving a single home (Van Abs, et al., 2018). Similar information is not available for sewer systems.

### Sewer Utility Rates and Household Costs

Sewer utility residential rates were compiled where available for municipalities within all regional systems (e.g., serving more than one municipality), all areas served by combined sewers, and all other systems with treatment plant design capacities exceeding 10 MGD. In total, rates were collected for 350 sewer systems, representing

roughly 64% of all sewer utility customers in New Jersey. Another 11.5% of households with sewer service are located in 60 municipalities where sewer costs are known to be addressed through the local property tax; in these cases, there is no sewer utility rate and residential customers receive no sewer bill. As a result, we have information addressing over 75% of all households with sewer service. The project budget did not allow for collection of rate information for all utilities, and some public utilities refused to provide rate information without an OPRA filing. No further rate collection efforts are anticipated for this Phase 1 report due to budgetary constraints.

**NOTE:** Every effort was made to ensure that the utility rates and costs (see [Appendix B](#)) are correct, but errors may exist. Any necessary corrections should be brought to the attention of the primary author.

It is important to note that in the case of sewer systems, NJDEP regulates the treatment facility through NJPDES permits for wastewater effluent discharges; each of these systems may have more than one collection system owned by other entities (usually municipalities but also municipal utility authorities) that do not have operating permits from NJDEP. In these situations, rates may be charged separately by the two utilities (the regional treatment facility and the local collection system), or by the local system only (incorporating the regional treatment system charges as part of the local rate). For this reason, collection of sewer rates is much more complicated than for water rates. Where sewer rates are charged, some are based on water demand volume,<sup>28</sup> while others are per household charges irrespective of water demands.<sup>29</sup> In addition, sewer rates for many towns were not available either on-line or by direct contact, as some municipalities would only release rate information upon receipt of an Open Public Records Act (OPRA) request.

The collected rates were used to estimate annual household costs for 60,000, 45,000, 30,000 and 15,000 gallons per year (if volumetric), per household (if not), or both. Annual household costs varied from over \$1000 to \$35, assuming 60,000 gallons of water demand, not including municipalities where all sewer costs are included in the property tax.

### Household Incomes

The report uses U.S. Census Bureau estimates by Census tract of median HHI (MHHI) and the distribution of households within Census Bureau income ranges, based on the 2012-2016 five-year ACS (American Community Survey). For the Affordability Ratio method, the analysis uses information from Teodoro (2018), which is based on the U.S. Bureau of Labor Statistics 2015 Consumer Expenditure Survey (CEX) for Essential Expenses (not including water and sewer costs) to derive Estimated

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<sup>28</sup> Systems charging based on annual water demands are including outdoor water uses during the growing season, which do not generate sewage. Other systems charge based on the annualized winter demand, excluding outdoor water uses.

<sup>29</sup> Per household charges do not change based on water demands, which means that small households are charged more per person than large households, and water-conserving households do not see a benefit from this conservation in their sewer charges.

Disposable Monthly Income at the 20<sup>th</sup> percentile household income for NYC and Philadelphia metropolitan regions.

### Analytical Approaches

The following approaches are used to understand how household affordability for water utility rates (water, sewer and combined) differ based on the definitions and metrics used. There is no consensus on the “right” measure of affordability, and no method will answer all questions or be perfect. The methods discussed below provide a basis for expert-level evaluation as to which are appropriate or inappropriate, and then for recommendation to Jersey Water Works and its collaborators as to the most useful approach for New Jersey, with specific criteria as to what makes an approach more or less useful. The last report section, on [Policy Implications](#), provides recommendations on how this information can be used.

### USEPA Residential Indicator Evaluation

This method applies the USEPA thresholds in their intended fashion, comparing the median household income for each utility to the nominal utility costs based on water demands as discussed above. The median household income for the utility service area is derived by matching census tract incomes to utility service areas provided by the NJ Department of Environmental Protection. As census tracts are often not contiguous with utility service areas, some uncertainty is inherent in the analysis.

### Relationship of Household Incomes to Utility Costs

This approach directly estimates the number of individual households in each geographic area having less income than needed to ensure that utility costs do not exceed threshold percentages of total income: 2% of income for water, both 2% and 2.5% of income for sewer, and both 4% and 4.5% of income for water and sewer combined. This analysis can be performed for any level of geography by identifying each unique geographic area in GIS (i.e., a polygon for each unique combination of census tract, water utility service area, and sewer utility service area), constructing an approximate income distribution (i.e. counts of households in each of the Census Bureau’s published household income ranges or target percentile, including median and 20<sup>th</sup> percentile) for each GIS polygon, and then summing all polygons contained in the geographic unit of interest. The income distribution within each polygon is assumed to mimic the income distribution of the host census tract, with the number of households in each income range or target scaled according to the percent of the tract’s total population contained in the polygon. This approach provides the number of households for which the water and sewer costs exceed the selected income threshold.

At the utility level, per-household costs are compared to the estimated median household income for the utility’s service area, showing the ratio of the utility’s per-household charge to its estimated median household income and flagging any utility service area for which the per-household charge exceeds the corresponding EPA threshold (2% of income for water, and both 2% and 2.5% of income for sewer). This comparison is also done at the level of the individual polygon, where the comparison is between 1) the median household income for the polygon’s host census tract and 2) the per-household charges of the water and sewer utilities associated with the polygon. Results at the polygon level are not published within this report, as there are over 7,000 polygons, but instead were fed back into GIS to help illustrate geographic variations of this measure of affordability within utility service areas, to reflect how incomes vary from one census tract to another within the service area, and how sewer charges vary from one

part of a water service area to another and vice versa.<sup>30</sup> All results from these analyses are reported in the following section: [Utility Costs Relative to USEPA 1994 Guidance Thresholds](#).

*Analysis by unit of geography*

**State Level** – The analysis starts with the number and percent of New Jersey households that have public water, public sewer service, and both, as well as the percentages of these for which we have usable cost data. Among households in utility service areas for which we have usable data, we then estimate (assuming household use of 60,000 gallons per year):

- The number and percent of households paying more than 2% of income on water bills
- The number and percent of households paying more than 2% of income on sewer bills
- The number and percent of households paying more than 2.5% of income on sewer bills
- The number and percent of households paying more than 4% of income on water and sewer bills combined
- The number and percent of households paying more than 4.5% of income on water and sewer bills combined

**Municipality and County Level** – We perform the same analysis at the county and municipal levels as at the state level, generating results for the same thresholds.

**Utility Level** – We perform the same analysis as at the state level, generating results for the same thresholds.

We also compare the approximated median household income for the utility service area to the income representing the level at which the utility costs represent a percentage of the HHI at USEPA thresholds at 2% MHI (water) and 2%/2.5% MHI (sewer), assuming household use of 60,000 gallons per year. Median household income was estimated for each utility service area by first constructing an approximate income distribution for the service area as essentially a weighted average of the income distributions of all census tracts either fully or partially contained within the service area, and then finding the approximate midpoint of that distribution.

Result: Summary results, plus spreadsheet table of utilities providing the annual rates and comparison to the HHI associated with the USEPA thresholds, as a ratio. *(Note this table represents a partial baseline measure for utility fiscal stress regarding the USEPA; it has been used to address household affordability but was not created for that purpose.)*

**GIS Polygon Level** – Within each GIS polygon (i.e. unique areas of census tract x water service area x sewer service area), per-household charges for the polygon’s water and sewer utilities (as applicable) are computed as a percent of the median household income for the polygon’s host census tract. Separate comparisons were done for water charges, sewer charges, and water and sewer combined, with polygons being excluded from each analysis where cost information was not available for the water or sewer utility, depending on the analysis. Polygons were specifically flagged if utility costs represent a

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<sup>30</sup> Note that these comparisons cannot be done at other levels of geography, because other geographies can be split among multiple utility service areas, meaning the summary statistics for that geographic unit would need to be compared against multiple utilities’ per-household charges. Thus, at any geography other than the utility service area, or the basic intersection polygon, the comparison of a summary income statistic to per-household utility charges is not guaranteed to be a one-to-one comparison.

percentage of the median HHI at the USEPA thresholds for utility viability of 2% MHI (water) and 2%/2.5% MHI (sewer) and 4%/4.5% MHI (both), assuming household use of 60,000 gallons per year. These results were not published directly but were instead fed back into GIS, to illustrate geographic patterns of variation in utility affordability within individual utilities' service areas.

We also performed an analysis at the polygon level similar to that for state, county, and municipality, producing estimates where feasible of:

- The percent of households paying more than 2% of income on water bills
- The percent of households paying more than 2% of income on sewer bills
- The percent of households paying more than 2.5% of income on sewer bills
- The percent of households paying more than 4% of income on water and sewer bills combined
- The percent of households paying more than 4.5% of income on water and sewer bills combined

#### Relationship of Other Affordability Metrics to Utility Costs

The prior methods are developed at the polygon level and then aggregated to utility, municipality, county and state levels. Other methods, discussed below, can only be assessed at the utility level due to the nature of the income threshold used (i.e., not based on actual household income but rather on statistical analyses). In addition, these methods can only be performed where an area is served by both water and sewer utilities for which household costs are available, because the comparison of income is to combined water and sewer utility costs; there is no separate metric for the two utilities. The analyses are by each combination of water and sewer utility.

#### *Teodoro Affordability Ratio Method*

This analysis follows the method of Teodoro (2018) using the Estimated Disposable Monthly Income for the 20<sup>th</sup> Percentile income household; the results for New York City and Philadelphia and the statewide results for New Jersey were used as available points of comparison.<sup>31</sup> It was not feasible given the project budget to develop Estimated Disposable Monthly Income specifically for New Jersey. Therefore, this evaluation gives a sense of possible New Jersey outcomes, to see whether a follow-up project would be useful to implement the complete method with New Jersey-specific data. The results should not be viewed as definitive for New Jersey. The method provides a threshold for assessing whether the rates are affordable. It also uses multiple levels of water demand, recognizing that household size at a single income will vary. The 2010 Census information can help assess the variability of household size and of household income, but it does not provide household income distribution by household size.

The method provides a comparison of combined water utility charges to Estimated Disposable Monthly Income at 20<sup>th</sup> Percentile Level. The research question is whether household charges exceed 10% of Estimated Disposable Monthly Income, a threshold suggested by Teodoro (2018).

Result: Summary results, plus spreadsheet table of results by water and sewer utility, showing utility charges as a percentage of Estimated Disposable Monthly Income at 20th Percentile Level

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<sup>31</sup> This method assesses household disposable income based on essential expenses at the 20th percentile household income for each major metropolitan area, using the 2015 Consumer Expenditure Survey (CEX) from the U.S. Bureau of Labor Statistics. While a more sub-regional measure of household disposable income would be preferable for the purposes of this study, there are methodological complications beyond the scope and budget of this analysis, in part due to the limited number of available CEX data points. Further analysis would be useful if funds are available.

for four levels of water demand, with identification of those areas exceeding 10%. All results from these analyses are reported in the section: [Utility Costs Relative to Disposable Income](#).

#### *Teodoro Minimum Wage Method*

This analysis follows the method of Teodoro (2018) to compare water and sewer charges (combined) to the NJ minimum wage of \$8.60 per hour. Do annual charges exceed 96 hours per year at minimum wage (8 hours of work per month)? Teodoro proposes this method as a complement to the Affordability Ratio, where a rate would be considered unaffordable if either threshold is exceeded. The \$15.00 per hour minimum wage that has been proposed for New Jersey and applied by the Port Authority of New York and New Jersey (partially) and other jurisdictions is also assessed, to show how the results would differ.

Result: Summary results, plus spreadsheet table of results by area (i.e., each unique combination of water and sewer utility), showing combined water utility charges as equivalent hours of minimum wage work, for four levels of water demand, with identification of those areas exceeding 8 hours. All results from these analyses are reported in the section: [Utility Costs Relative to Minimum Wage](#).

#### *Comparison to Standard Income Thresholds*

This set of evaluations compares the individual water and sewer utility rates to specific income targets:

- National Poverty Level
- New Jersey Estimated Poverty Level (115% and 125% of the National Poverty Level)
- 175% of National Poverty Level (per NJ Board of Public Utilities threshold for energy assistance)
- 20<sup>th</sup> Percentile Household Income Level

Result: Summary results, plus spreadsheet table of results by water and sewer utility, showing water utility charges as a percentage of the four income targets. All results from these analyses are reported in the section: [Utility Costs Relative to Poverty Levels](#).

#### *Comparison to ALICE Household Survival Budget by County*

This set of evaluations compares the individual water and sewer utility rates to the United Way's ALICE Household Survival Budget for the county most relevant to the utility.

Result: Summary results, plus spreadsheet table of results by water and sewer utility, showing water utility charges as a percentage of the relevant ALICE Household Survival Budget. All results from these analyses are reported in the section: [Utility Costs Relative to United Way ALICE Thresholds](#).

#### *Overview of Data and Analytical Limitations*

This report relies on available estimates and data for population, household income and utility rates. These were all from different years but sufficiently close to one another as to provide a solid basis for analysis.

Population was estimated for drinking water and sewer utilities by Census tract using a geographic analysis method (dasymetric analysis) previously used in a Rutgers study for the New Jersey Department of Environmental Protection (see Van Abs, et al., 2018) based on the 2010 Census and 2012 land use/land cover data from the NJDEP. The estimates are considered close approximations but involve a disaggregation of Census data that will have some inherent uncertainty.

## Assessing the Affordability of Water and Sewer Utility Costs in New Jersey

Household income metrics are based on Census tract-level information, which depending on the analysis is disaggregated to sub-tract levels for multiple utilities or aggregated for utility-level analyses. Census income cohorts are provided in ranges, which can skew estimates of the income percentiles and median income, and the division of household income from census tracts into smaller polygons (associated with specific combinations of water utility, sewer utility and census tract) can result in estimation errors.

In some analyses, information specific to New Jersey or specific portions of the state was not available, and so surrogate information was used to provide an initial sense of how a specific methodology would work. This issue applies specifically to the Teodoro Affordability Rate method.

Utility rate information was gathered by Rutgers University students and then checked to the extent feasible. The utility costs used in this report represent the best understanding of the rate structures provided by utilities on-line or by direct contact. See Appendix B for more details.

The analyses in this report are intended to provide a basis for discussion, but the project budget did not allow for a more rigorous analysis of some methods.

## Results

### Utility Stress Using USEPA 1994 Guidance Thresholds

The USEPA thresholds were compared to utility costs (assuming water demands of 60,000 gallons per year), to indicate the extent to which utilities exceeded those thresholds at median household income (MHI), which is the USEPA Residential Indicator. As discussed previously, this threshold is not intended for use in determining household affordability, but rather is one indicator of whether a utility is financially viable given planned capital costs plus operating costs.

At the statewide level, we have utility rate and costs information for over 90% of those households served by water utilities (nearly 2.5 million households), over 64% of all households served by sewer utilities (over 1.8 million households), and 61% of those households served by both water and sewer utilities (over 1.6 million households). Of the utilities for which cost information is available, **Table 6** provides a summary of utilities that do or do not exceed the thresholds.

**Table 6. Utility Comparison to USEPA Thresholds for Residential Indicator**

	<b>Utilities with Costs Exceeding USEPA Thresholds</b>	<b>Utilities with Costs Not Exceeding USEPA Thresholds</b>
<b>Water Utilities: &gt;2% of Median Household Income</b>	0	159
<b>Sewer Utilities: &gt;2% of Median Household Income*</b>	2	288
<b>Sewer Utilities: &gt;2.5% of Median Household Income*</b>	0	290

\*60 municipalities that cover sewer costs through property taxes are not included in this analysis.

Based on the initial analysis, no water utilities exceeded the 2% threshold. The only sewer utilities exceeding the 2% threshold were identified as Newark and Camden City,<sup>32</sup> where the ratio between MHI and the income necessary for rates to be exactly 2% of MHI is 0.998 and 0.87, respectively; these two utilities are on the border line or just beyond the 2% threshold. However, neither of those utilities exceeds the 2.5% threshold.

Based solely on the USEPA threshold, the result is that New Jersey would not be seen as having a significant affordability problem at the present time. One critical point is that the analysis is based on 2017 utility rates, and therefore does not address potential future rates. However, in addition to Newark and Camden City, there are only six other utilities that are below a ratio of 1.5, a level indicating that their rates could increase by 50% before crossing the USEPA threshold.

### Household Financial Stress Using USEPA 1994 Guidance Thresholds

More importantly, a major problem with the USEPA thresholds is that they do not assess household affordability, which can vary widely within a utility service area that in general seems to have no general affordability issue. Some utilities elsewhere have used the USEPA threshold to assess household

<sup>32</sup> However, updated information for Camden City emphasizes the complexity of analyzing rates, as the rates charged by Camden County MUA are 40% lower per household due to host city benefits, but the City also charges internal sewer costs through its drinking water rates; the portion devoted to sewer costs was not readily available.

affordability. While this use of the thresholds was not directly intended by USEPA, the agency does note that utilities can improve their financial viability by reducing the number of households that exceed the threshold. Therefore, we also calculated the number of households within each of the utility service areas that would have costs that exceed the USEPA thresholds.

Based on the available utility costs for water demands of 60,000 gallons per year, **Table 7** provides the statewide aggregate results.

*Table 7. Statewide Aggregate Information for Households*

	Households with Cost Estimates for Water Utilities	Households with Cost Estimates for Sewer Utilities	Households with Cost Estimates for Both Utilities
<b>Households Exceeding 2% HHI</b>	387,721	281,165	
<b>% of Total Households with Data</b>	15.7%	15.1%	
<b>Households Exceeding 2.5% HHI</b>		219,916	
<b>% of Total Households with Data</b>		11.8%	
<b>Households Exceeding 4.0% HHI</b>			267,263
<b>% of Total Households with Data</b>			16.3%
<b>Households Exceeding 4.5% HHI</b>			233,592
<b>% of Total Households with Data</b>			14.3%

As can be seen from **Table 7**, based on the initial analysis, the household results are strikingly different from the utility-level results. Nearly every water and sewer utility has at least some households that exceed the 2% threshold, even where the utility results are far below that threshold overall. In both cases, most systems have at least 5% of their households exceeding the threshold; the maximums are 40.5% for water utilities and 30.5% for sewer utilities. In addition, there are 60 municipalities where the inclusion of sewer costs within the property tax bills will increase household fiscal stresses regarding property taxes. This report does not include an analysis of the extent to which property taxes differ between municipalities that charge a sewer bill separately and the 60 that incorporate sewer costs into property taxes.

At the county level (**Table 8**), based on the initial analysis, every county has at least 5% of its households currently paying over 2% for water (except Morris at 4.5%), 2% for sewer, and 4% for both water and sewer (except Morris at 4.9%). The most burdened counties at the 4% combined level are Essex (26.1%), Hudson (22.1%) and Camden (21.7%), all of which are highly urbanized counties with older cities.

*Table 8. Percent of Households Paying More than USEPA Thresholds by County*

County	Total HHs (2016 ACS)	> 2.0% of income on water bill	> 2.0% of income on sewer bill	> 2.5% of income on sewer bill	> 4.0% of income on both bills	> 4.5% of income on both bills
Atlantic	101,083	19.5%	17.2%	13.1%	18.9%	16.2%
Bergen	337,069	12.0%	8.8%	6.9%	9.9%	8.5%
Burlington	164,623	13.1%	13.3%	10.1%	13.0%	11.3%
Camden	185,722	19.3%	22.7%	18.0%	21.7%	19.2%
Cape May	40,073	14.1%	10.2%	7.3%	8.8%	7.2%

Assessing the Affordability of Water and Sewer Utility Costs in New Jersey

County	Total HHs (2016 ACS)	> 2.0% of income on water bill	> 2.0% of income on sewer bill	> 2.5% of income on sewer bill	> 4.0% of income on both bills	> 4.5% of income on both bills
Cumberland	50,718	7.9%	No data*	No data	N/A**	N/A
Essex	279,480	19.7%	29.9%	24.5%	26.1%	23.3%
Gloucester	104,762	8.2%	11.8%	9.0%	9.6%	8.2%
Hudson	251,693	22.5%	21.3%	17.0%	22.1%	19.6%
Hunterdon	46,935	11.5%	No data	No data	N/A	N/A
Mercer	130,129	13.8%	9.7%	7.5%	12.2%	10.5%
Middlesex	283,279	12.2%	9.6%	7.2%	10.9%	9.3%
Monmouth	232,868	16.1%	10.5%	7.7%	12.9%	11.0%
Morris	179,734	4.5%	6.0%	4.5%	4.9%	4.2%
Ocean	222,609	15.0%	12.5%	9.0%	13.5%	11.3%
Passaic	161,534	21.8%	12.7%	9.9%	19.0%	16.8%
Salem	24,255	28.6%	No data	No data	N/A	N/A
Somerset	116,456	10.2%	8.0%	6.1%	9.2%	8.0%
Sussex	53,648	13.1%	No data	No data	N/A	N/A
Union	186,890	19.2%	8.1%	6.3%	13.7%	11.8%
Warren	41,454	17.5%	No data	No data	N/A	N/A

\* No rate information was collected for sewer utilities in the county

\*\* Not applicable, as no sewer cost information is available for the county

Not surprisingly, results are more diverse at the municipal level (**Table 9**). A few municipalities have no households exceeding the 4% combined threshold. However, based on the initial analysis, 21 municipalities have more than 25% of their households paying greater than 4% of household income on both water and sewer services, with eight having 30% or more of their households exceeding that threshold.

**Table 9. Percent of Households Paying More than USEPA Thresholds by Municipality**

Municipality	Total HHs (2016 ACS)	> 2.0% of income on water bill	> 2.0% of income on sewer bill	> 2.5% of income on sewer bill	> 4.0% of income on both bills	> 4.5% of income on both bills
Camden City	24,774	31.1%	54.4%	46.5%	44.1%	40.1%
Newark	94,158	30.2%	49.0%	40.8%	40.2%	36.3%
Lindenwold	7,107	39.9%	31.7%	22.2%	36.3%	31.8%
Atlantic City	15,407	16.0%	47.4%	38.3%	32.7%	29.2%
Pleasantville	6,723	37.1%	25.1%	18.4%	31.6%	27.3%
East Orange	24,858	22.2%	38.3%	30.8%	30.9%	27.2%
Union City	23,675	28.6%	33.0%	25.9%	30.4%	26.7%
Gloucester City	3,906	27.9%	32.2%	24.6%	30.0%	26.1%
Magnolia	1,631	27.6%	33.0%	27.7%	29.4%	27.7%
Berkeley Twp	19,978	39.1%	15.5%	10.7%	29.4%	24.6%
West New York	19,048	26.2%	30.1%	24.3%	28.3%	25.2%

Municipality	Total HHs (2016 ACS)	> 2.0% of income on water bill	> 2.0% of income on sewer bill	> 2.5% of income on sewer bill	> 4.0% of income on both bills	> 4.5% of income on both bills
Woodlynne	782	26.4%	26.6%	20.8%	26.5%	24.0%
Bellmawr	4,339	31.5%	20.1%	14.5%	26.3%	22.5%
Barrington	2,734	26.5%	26.1%	21.6%	26.3%	24.5%
Paterson	43,769	33.7%	17.2%	13.6%	26.0%	23.3%
Egg Harbor City	1,415	28.0%	23.9%	15.9%	25.9%	20.0%
Runnemede	3,108	27.5%	23.7%	17.2%	25.9%	23.3%
City of Orange	11,471	21.9%	29.0%	22.8%	25.5%	22.5%
Fairview	5,349	25.3%	25.1%	20.0%	25.2%	22.3%
Clementon	1,869	25.7%	24.6%	19.1%	25.1%	22.1%
Glassboro	6,134	28.2%	21.7%	17.1%	25.0%	22.2%

At the polygon level (the smallest area of analysis representing a unique combination of Census tract, water utility and wastewater utility), the highest results for water and sewer charges as a percent of median household income (MHI) were 3.8% and 5.4%, respectively, and for polygons with available utility costs for both water and sewer, the maximum rate was 8.7%. The median levels as a percent of median household income (MHI) for water, sewer and combined were much lower, at 0.5%, 0.6% and 1.2%.

The polygon results clearly show that when addressing median household income, most areas are well below the USEPA thresholds of 2% and 4% or 4.5% but some areas were far above the thresholds. However, the percentage of households in each polygon that exceeded the USEPA thresholds based on actual income, not median income, provides a very different story. Some polygons show very high concentrations of household exceeding the USEPA thresholds, with maximum levels for water, sewer and combined costs routinely around 70% to 80%; the median results were much lower, at 10.2, 10.9 and 12.5%, respectively. **Figure 4** shows the results for water bills, covering over 90% of those households with water utility service. As can be seen, many polygons (vertical axis) have a significant percentage of their households paying more than 2% of their household income on water bills (horizontal axis).

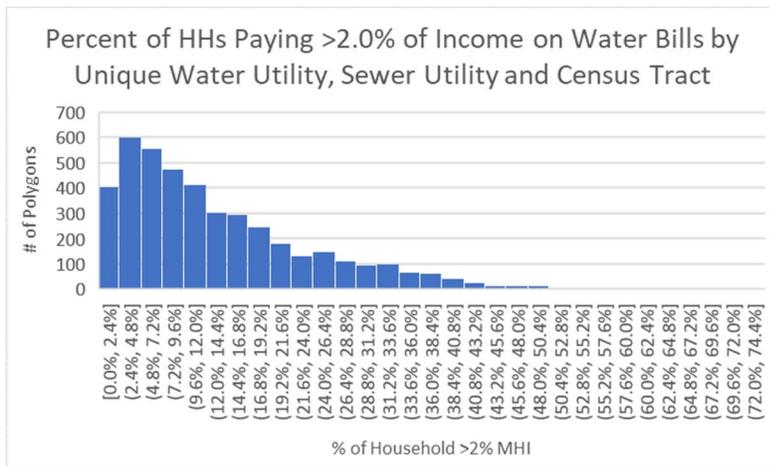
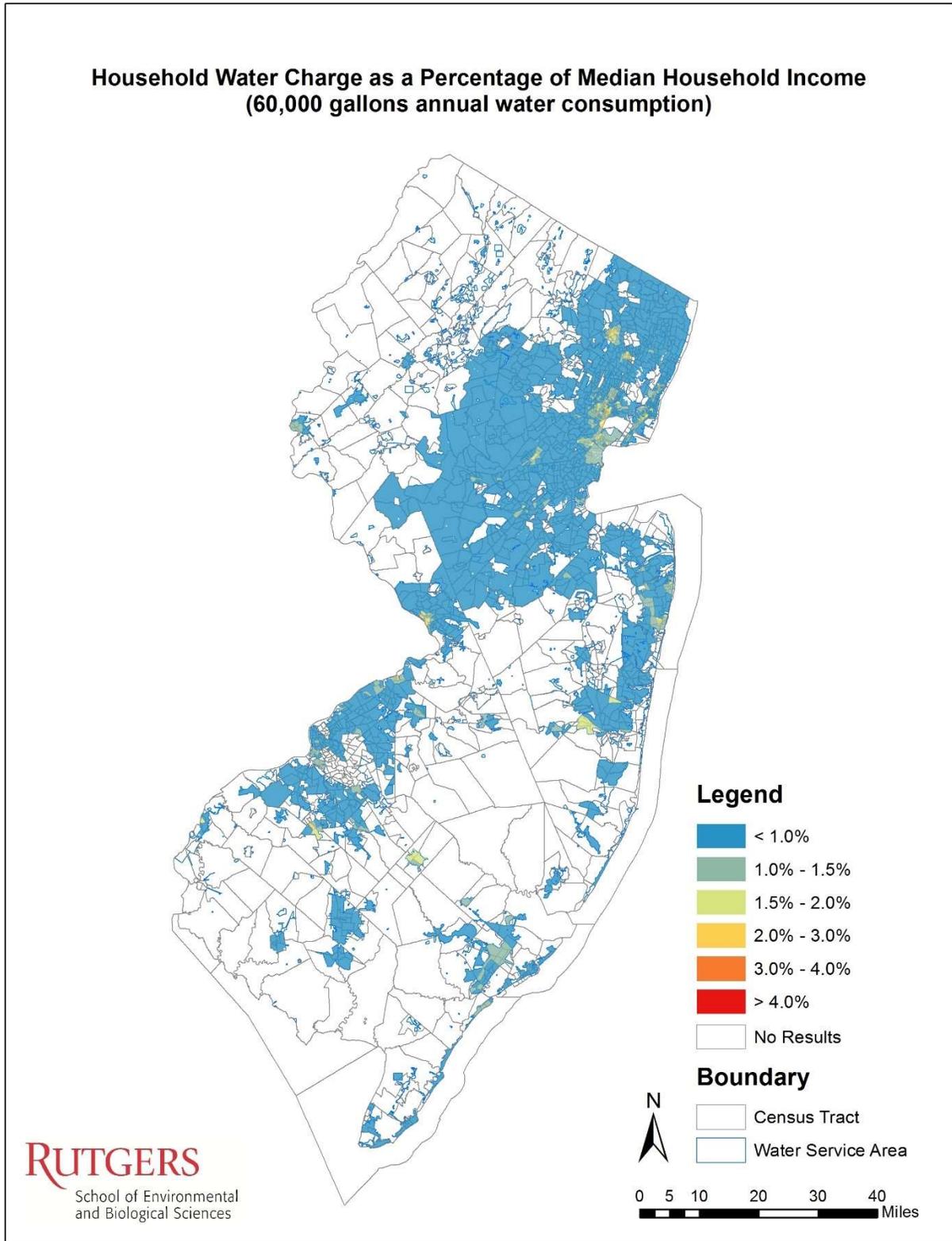
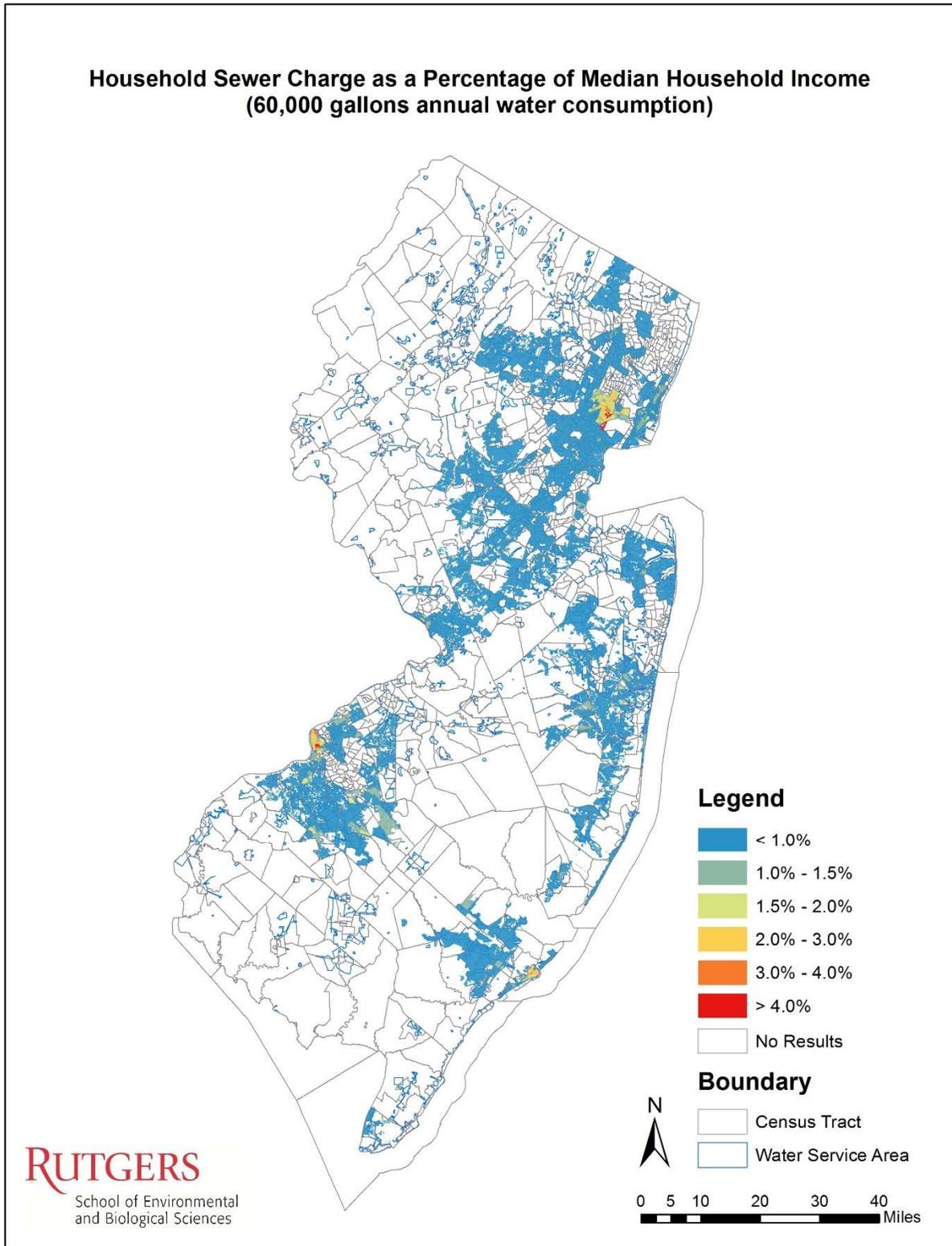


Figure 4: Affordability Curve for Water Utility Service

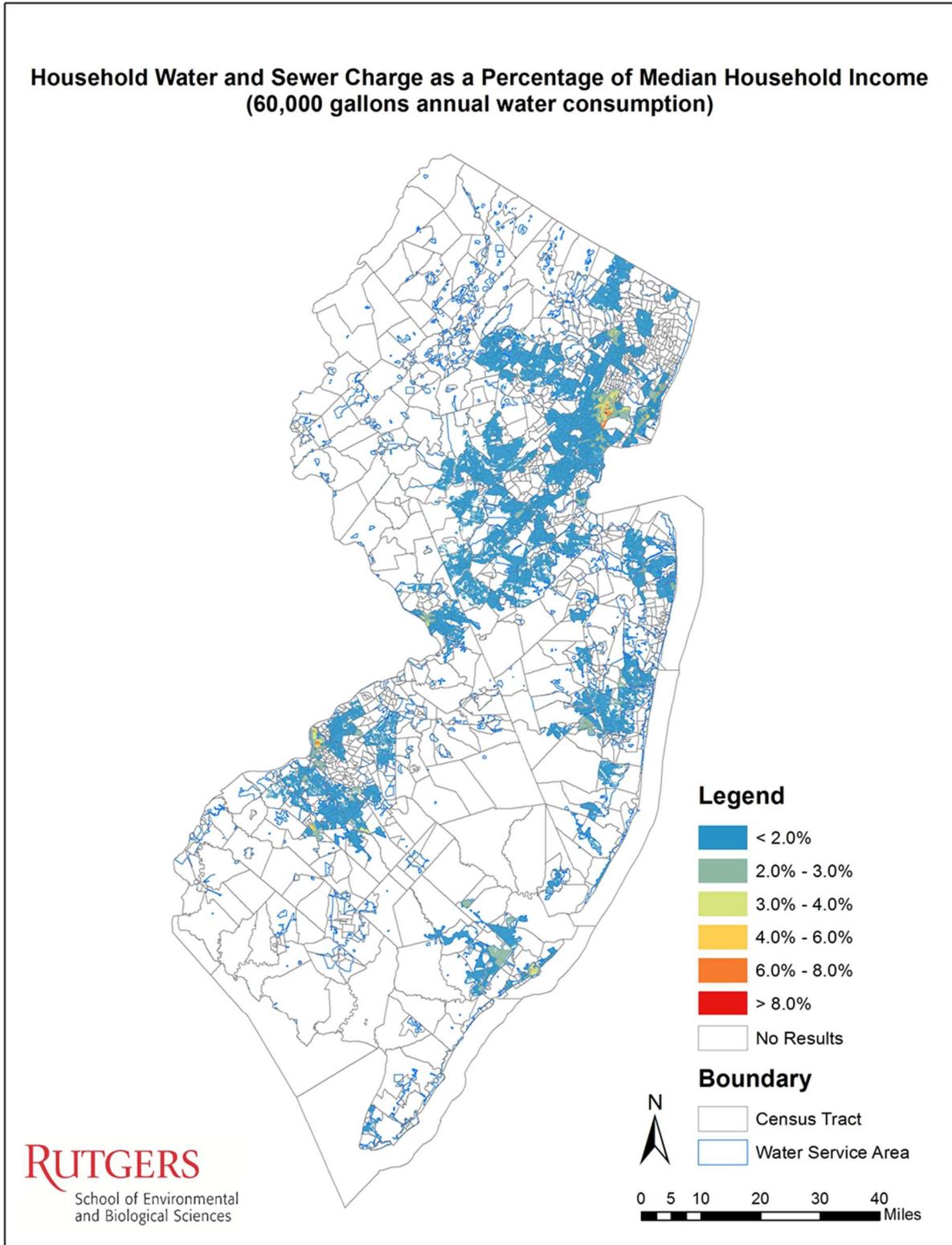
In both cases, and as show in **Figures 5 through 12**, the results clearly show the influence of concentrated areas of low-income households. Figures 5 through 7 present household utility costs (water, sewer and combined, respectively) as a percentage of median household income for the utility. Figures 8 through 12 present the percentage of households in each Census tract paying more than a specified percentage of their actual income (not the median income) for water (2%), sewer (2% and 2.5%) and combined (4% and 4.5%) utility services. See Appendix C for similar maps of the Newark and Camden areas, which provide a more detailed view.



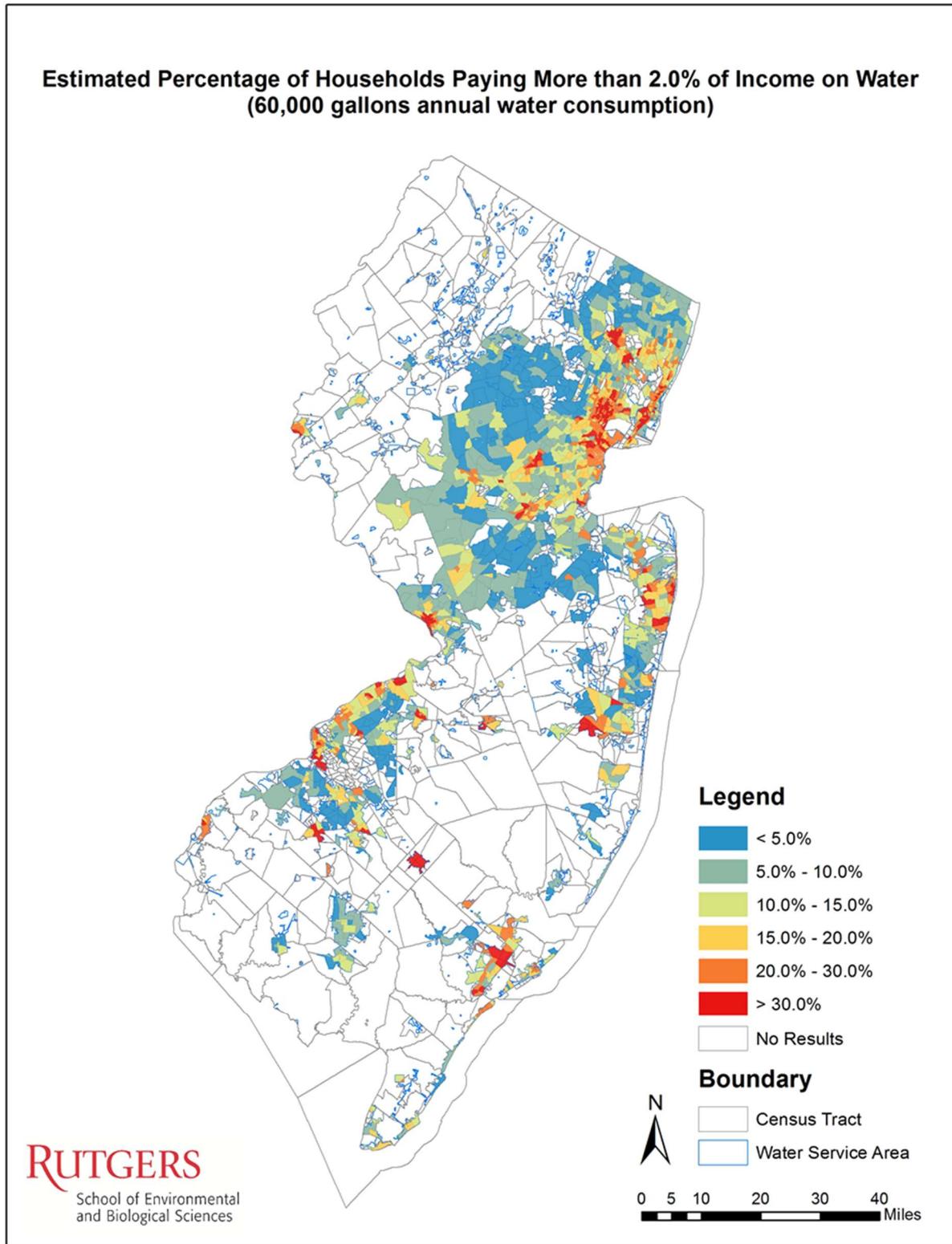
*Figure 5: Household Water Charge as a Percentage of Median Household Income (60,000 gallons annual water consumption)*



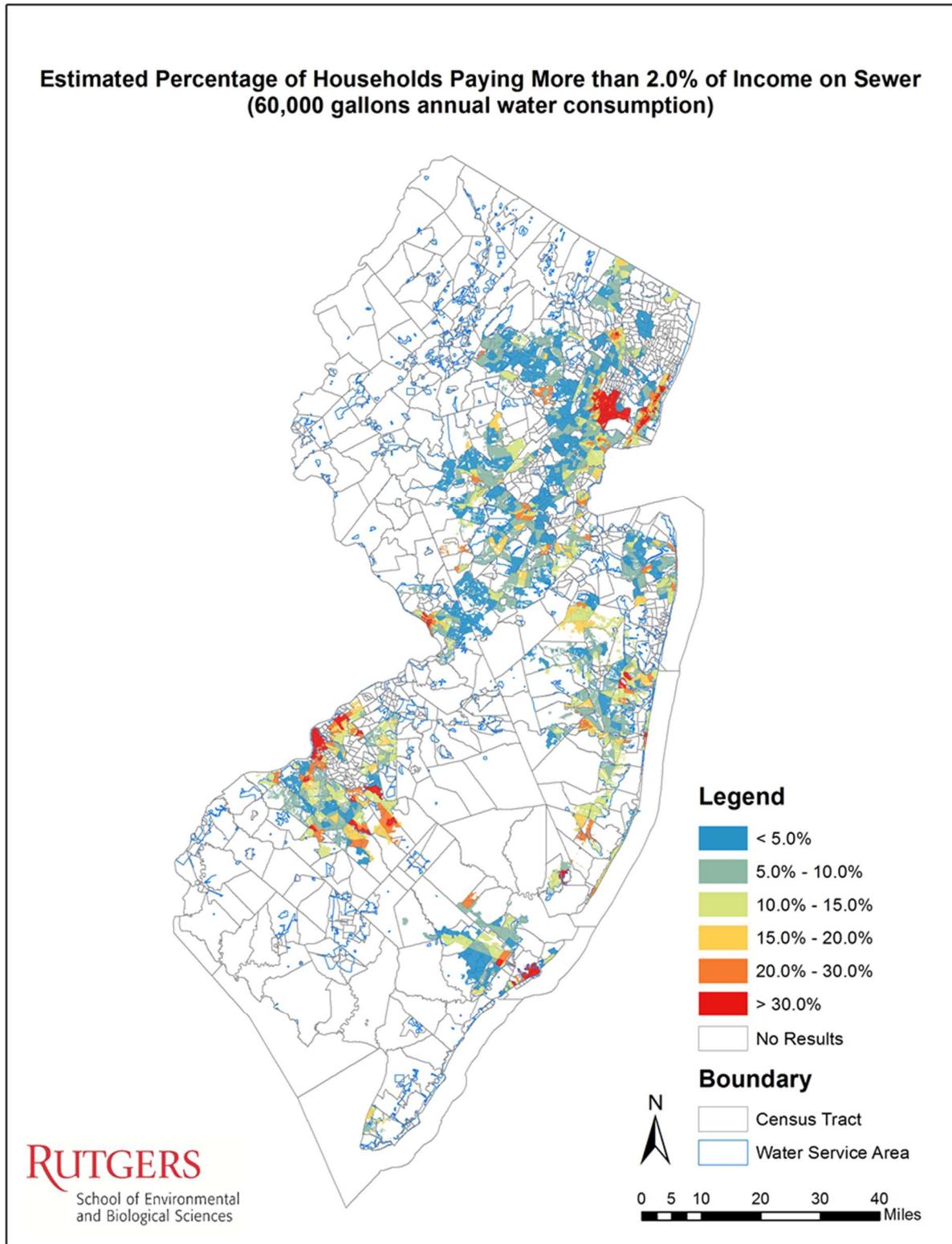
*Figure 6: Household Sewer Charge as a Percentage of Median Household Income (60,000 gallons annual water consumption)*



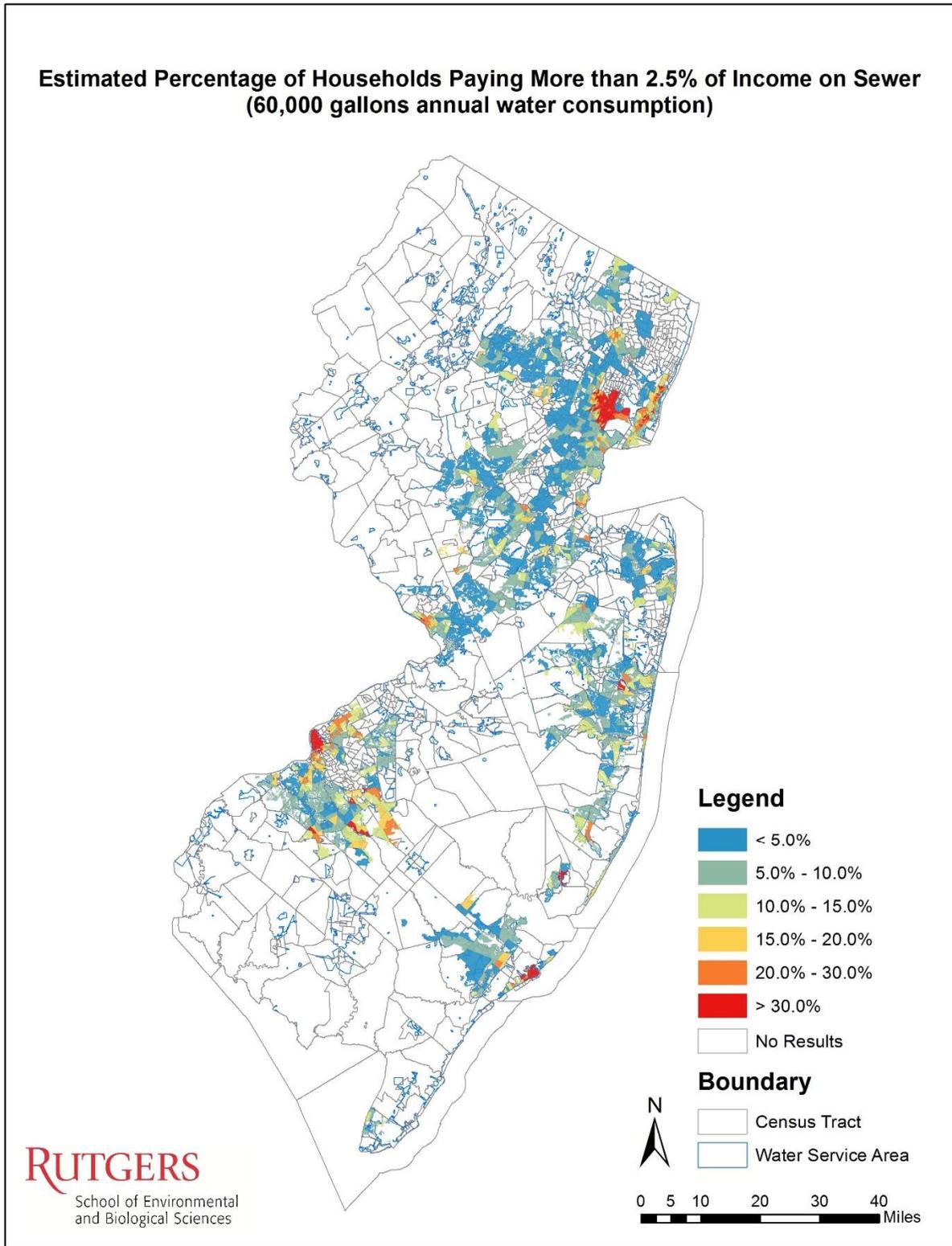
*Figure 7: Household Water and Sewer Charge as a Percentage of Median Household Income (60,000 gallons annual water consumption)*



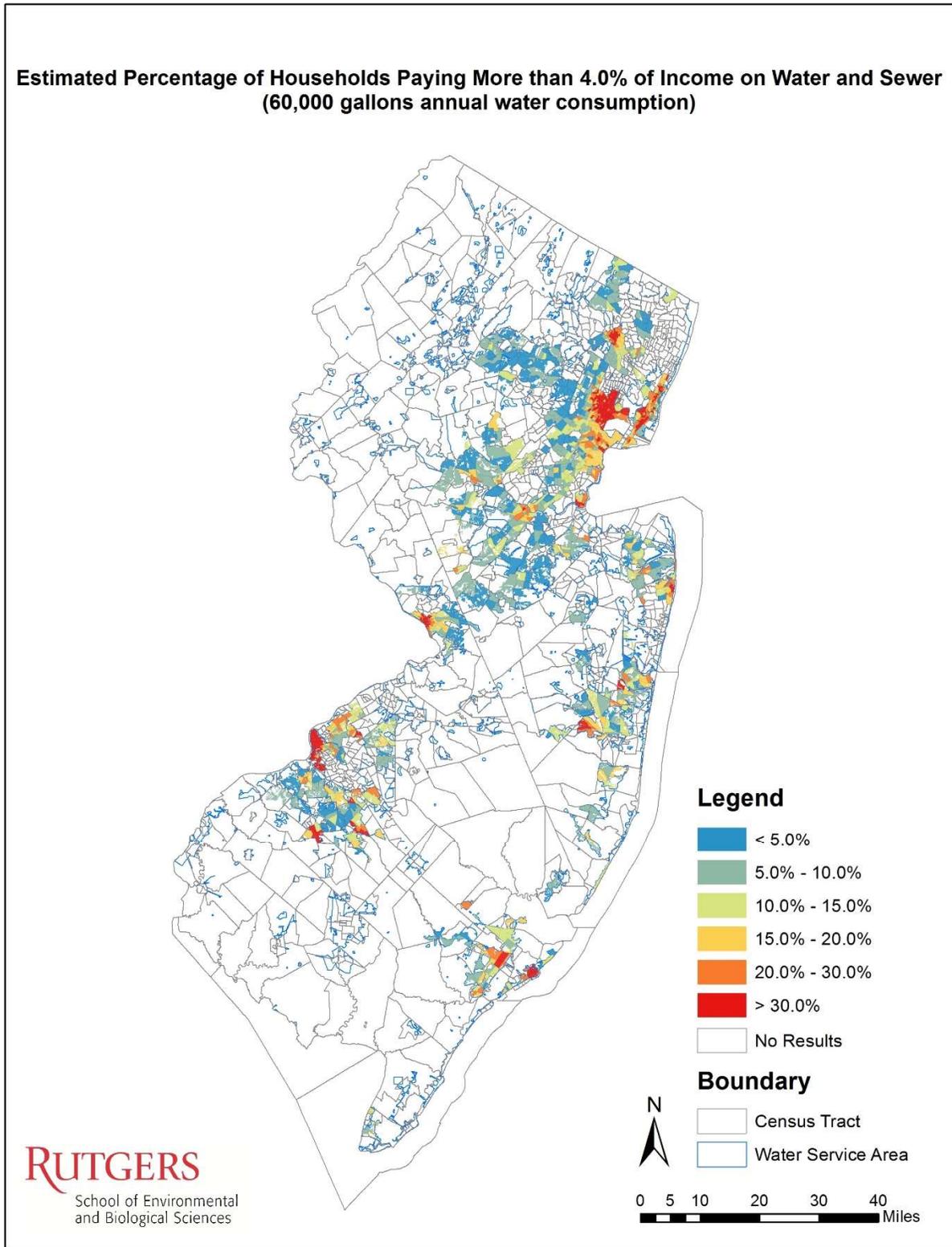
*Figure 8: Estimated Percentage of Households Paying More than 2.0% of Income on Water (60,000 gallons annual water consumption)*



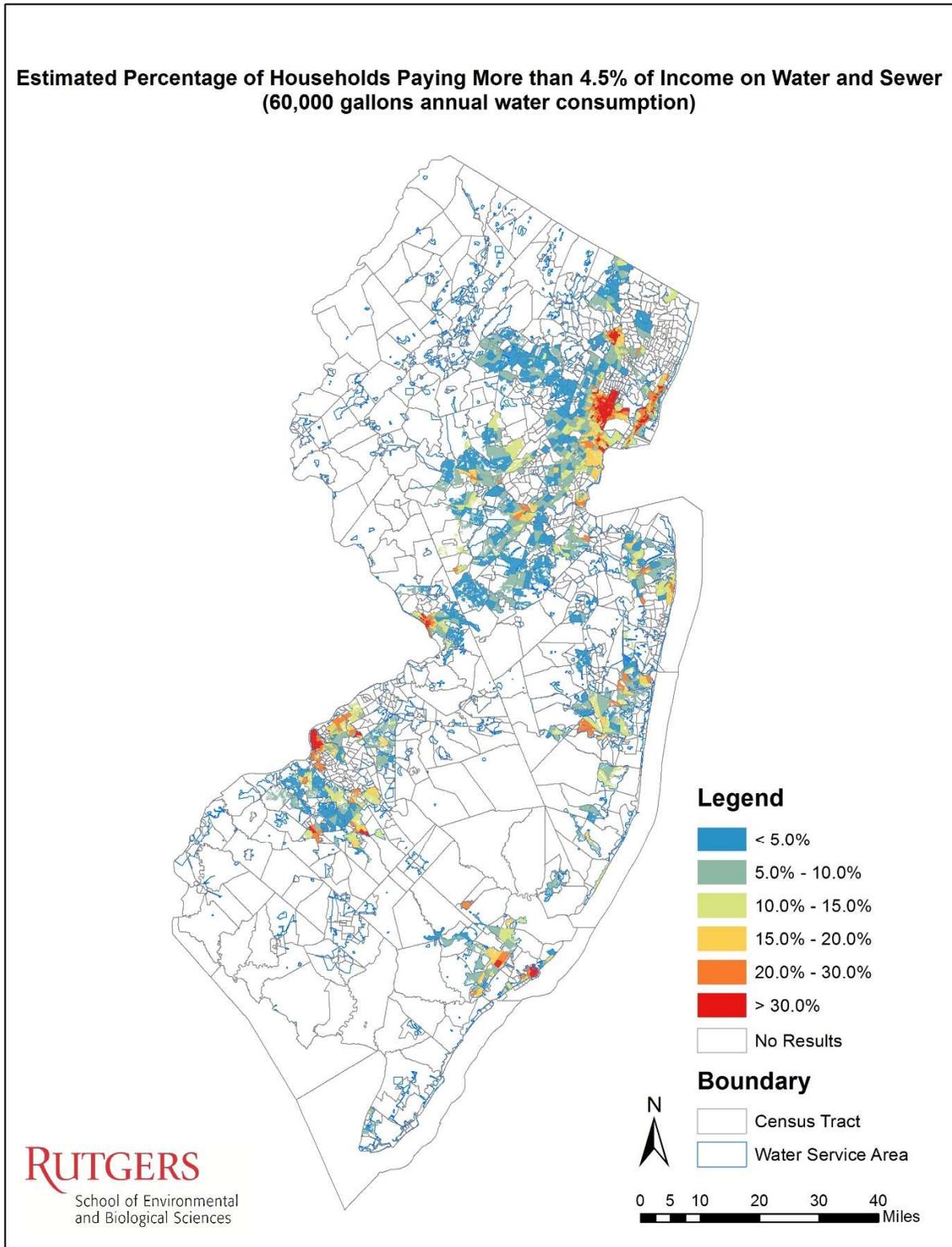
*Figure 9: Estimated Percentage of Households Paying More than 2.0% of Income on Sewer (60,000 gallons annual water consumption)*



**Figure 10: Estimated Percentage of Households Paying More than 2.5% of Income on Sewer (60,000 gallons annual water consumption)**



**Figure 11: Estimated Percentage of Households Paying More than 4.0% of Income on Water and Sewer (60,000 gallons annual water consumption)**



**Figure 12: Estimated Percentage of Households Paying More than 4.5% of Income on Water and Sewer (60,000 gallons annual water consumption)**

### Utility Costs Relative to Disposable Household Income

Teodoro (2018) suggests that combined sewer and water utility costs should be no more than 10% of disposable household income at the 20<sup>th</sup> percentile household income level, a metric he calls the Affordability Ratio. As a way of investigating the usefulness of this metric in New Jersey, sewer and water utility costs were compared individually to the estimated disposable household income levels for New Jersey as a whole, and for New York City and Philadelphia. To properly apply this method, the appropriate disposable household income would need to be derived for specific regions of New Jersey, but the statewide, New York City and Philadelphia values provide a sense of possible results for New Jersey utilities. We were not able to develop Affordability Ratios directly for the combined sewer and water utility costs, as the two utilities have different service areas in many cases. However, the median costs of sewer and water utilities are nearly the same, approximately \$400 per year. Therefore, a rough sense of whether total costs exceed the 10% threshold can be obtained by combining the median results for sewer and water utilities. The Affordability Ratio results are summarized in **Table 10**.

For both sewer and water utilities, the median results for NYC and Philadelphia are all above 5%, and therefore the combined median rates would exceed 10%. The New Jersey statewide results are roughly half of those for the two cities, reflecting its much higher disposable income level. The maximum results are much higher for both sewer and water utilities but much less so for the largest 37 water utilities, which provide service to 90% of all water customers.

Of 258 sewer utilities with rate information, five (NJ statewide case), 178 (NYC case) and 193 (Philadelphia case) exceed a 5% level. Of 170 water utilities with rate information, two (NJ statewide case), 101 (NYC case) and 115 (Philadelphia case) exceed a 5% level. Most of the largest 37 water utilities, which serve 80% of all water utility customers in New Jersey, exceed a 5% level in the NYC and Philadelphia comparison; the nine water utilities that do not exceed 5% are all municipal water departments or municipal utility authorities. However, none of the largest 37 water utilities exceed the 5% level in the NJ statewide case.

**Table 10. Affordability Ratio Estimates for NJ Sewer and Water Utilities**

	Maximum %	Minimum %	Median %	Average %
<b>Sewer Utilities</b>				
NJ Statewide	6.26%	0.20%	2.33%	2.48%
New York City	15.49%	0.50%	5.76%	6.13%
Philadelphia	17.11%	0.56%	6.36%	6.77%
<b>Water Utilities</b>				
NJ Statewide	5.39%	0.49%	2.34%	2.43%
New York City	13.34%	1.20%	5.79%	6.00%
Philadelphia	14.74%	1.33%	6.40%	6.63%
<b>Largest 37 Water Utilities</b>				
NJ Statewide	3.48%	0.86%	2.57%	2.45%
New York City	8.60%	2.12%	6.36%	6.06%
Philadelphia	9.51%	2.35%	7.02%	6.69%

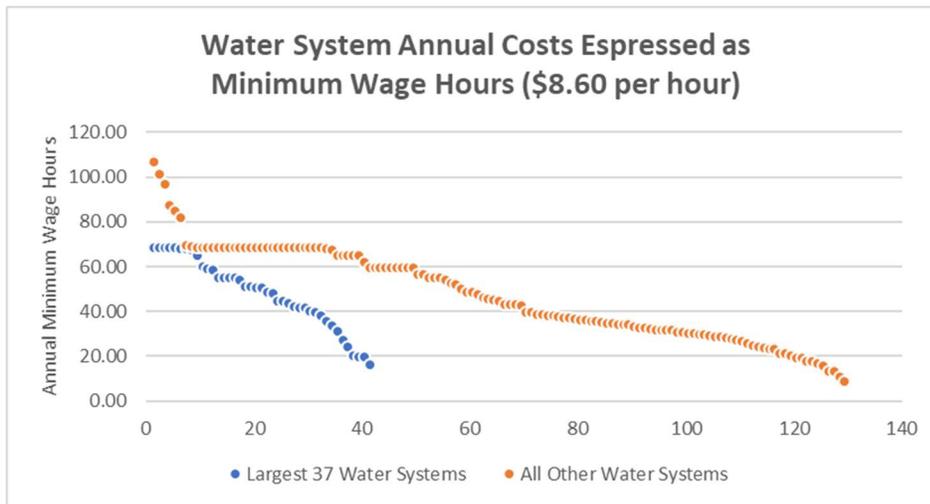
### Utility Costs Relative to Minimum Wage

Teodoro (2018) suggests that a household dependent on a minimum wage income should need to spend no more than the equivalent of eight (8) hours of minimum wage work on both water and sewer

utilities, or 96 hours per year. As an initial effort to assess where New Jersey utilities stand regarding this proposed metric, we evaluated water and sewer utility costs separately. Several results are important here, as shown in **Table 12**. First, the median costs for sewer and water utilities combined equals 93 minimum wage hours, nearly the threshold suggested by Teodoro. Second, the maximum household costs for both sewer and water exceed the 96 hours per year threshold. Third, the median costs for the largest 37 water utilities are somewhat higher than the median for all water utilities, but the maximum costs are far lower. **Figure 13** shows the relationship among the largest utilities versus all other utilities. The six outliers shown in orange (upper left of the graph) are all relatively small municipal utility departments, but no information is available on why their costs are so much higher.

**Table 11. NJ Minimum Wage Hours Necessary to Pay Annual Utility Costs**

Statistic	Sewer Utilities	Water Utilities	Largest 37 Water Utilities
Maximum	125.12	107.75	69.50
Minimum	4.07	9.73	17.16
Median	46.51	46.76	51.35
Average	49.50	48.48	48.93



**Figure 13: New Jersey Minimum Wage Hours Required to Pay Annual Water Utility Costs**

What if New Jersey’s minimum wage increased to \$15.00 per hour? Assuming that the change was instantaneous (something that is not currently proposed) and compared to 2017 rates, the changes are significant (**Table 13**), with a 42.7% reduction in all statistical measures. The medians for combined costs drop from over 93 hours to over 53 hours, well within the suggested threshold of 96 hours. While we recognize that sewer and water rates are likely to increase during any transition period to a \$15.00 minimum wage, in most cases the results would remain well with the 96-hour threshold.

**Table 12. \$15.00 Minimum Wage Hours Necessary to Pay Annual Utility Costs**

Statistic	Sewer Utilities	Water Utilities	Largest 37 Water Utilities
Maximum	71.73	61.78	39.85
Minimum	2.33	5.58	9.84
Median	26.67	26.81	29.44
Average	28.38	27.80	28.05

### Utility Costs Relative to Poverty Levels

As discussed above, existing programs use various poverty levels as thresholds for household assistance programs. Philadelphia caps total costs at 2.5% of income at the poverty line and 3% up to 150% of the poverty line. New Jersey provides financial assistance when individual energy bills (e.g., heating energy, non-heating electricity) exceed 3% each, and 6% total.

Sewer and water utility costs were compared to the national poverty level and 125%, 150% and 175% of that level. As shown in **Table 11**, the median levels are all below 2.5% of the thresholds, the Philadelphia rate for the poverty line. Some utilities, however, exceed that threshold (e.g., 26 sewer utilities, six water utilities), with progressively fewer such at higher incomes. For the most part, the 26 sewer utilities are either very small facilities or collection systems contributing to regional treatment facilities, including some major municipalities such as Newark, East Orange and Gloucester City; Camden is just below this threshold. The six water utilities are all relatively small municipal systems.

**Table 13. Sewer and Water Utility Costs Relative to Poverty Level Thresholds**

Statistic	Costs as % of National Poverty Level		Costs as % of 125% National Poverty Level		Costs as % of 150% National Poverty Level		Costs as % of 175% National Poverty Level	
	Sewer	Water	Sewer	Water	Sewer	Water	Sewer	Water
<b>Maximum</b>	4.42%	3.81%	3.54%	3.05%	2.95%	2.54%	2.53%	2.18%
<b>Minimum</b>	0.14%	0.34%	0.12%	0.27%	0.10%	0.23%	0.08%	0.20%
<b>Median</b>	1.64%	1.65%	1.31%	1.32%	1.10%	1.10%	0.94%	0.94%
<b>Average</b>	1.75%	1.71%	1.40%	1.37%	1.17%	1.14%	1.00%	0.98%

### Utility Costs Relative to United Way ALICE Thresholds

The Household Survival Budgets for ALICE households (Asset Limited, Income Constrained, Employed) provide a different way of looking at affordability. In this case, the Household Survival Budget is the income necessary for a household of four in each county to be achieving a modest lifestyle and no savings, given the cost of living for that county. The budgets assume that water and sewer utility costs are included in the fair market rent of a two-bedroom apartment for a family, which ranges from \$1025 to \$1458 per month (\$12,300 to \$17,496 per year). Given that the median sewer and water utility costs are each \$33 per month (\$400 per year), or \$66 per month total (\$800 per year), the combined median costs would comprise 6.4% to 4.5% of the housing component, or 1.45% to 0.99% of the total Household Survival Budget, depending on the county.

We compared sewer and water utility costs to the relevant ALICE Household Survival Budget for the county most closely associated with each utility. **Table 14** shows the results. As with prior analyses, a few water utilities have much higher costs than the others, resulting in a significantly greater maximum for all water utilities than for the 37 largest water utilities, but the median for the latter is somewhat higher. Sewer utilities have a lower maximum value and a comparable median value to results for all water utilities.

*Table 14. Sewer and Water Costs as a Percent of United Way ALICE Household Survival Budgets*

<b>Statistic</b>	<b>Sewer Utilities</b>	<b>Water Utilities</b>	<b>Largest 37 Water Utilities</b>
<b>Maximum</b>	1.34%	1.57%	1.06%
<b>Minimum</b>	0.05%	0.12%	0.21%
<b>Median</b>	0.60%	0.63%	0.75%
<b>Average</b>	0.64%	0.65%	0.68%

The next question is how to use this information in identifying households with unaffordable water and sewer costs. No threshold or approach using the ALICE budgets has previously been proposed. The ALICE budgets are thresholds for support of a specific, relatively limited quality of life for a household. To the extent that actual household incomes are less than the Household Survival Budget, household choices must be made as to which necessary household expenditures to cut; fixed or semi-fixed costs such as sewer and water (whether or not they are hidden in housing rental costs) will be an increasing burden.

Median sewer and water utility costs are roughly 1.2% to 1.3% of the Household Survival Budgets. One possible approach is to develop a sliding scale, where sewer and water utility costs are seen as increasingly unaffordable as actual income drops to specific percentages of the Household Survival Budgets. For example, if sewer and water utility cost represent 1.2% of the Household Survival Budget, a household at 75% and 50% of the Household Survival Budget would have sewer and water utility costs of 1.8% and 2.4% of the Household Survival Budget, respectively. Affordability programs could offset the increased cost burden (as a percent of the Household Survival Budget) from the 75% threshold and below, with increasing assistance as income declines, so that the sewer and water utility costs remain at no more than 1.8% of their household income.

## Discussion

Water and sewer utility costs have been rising faster than the Consumer Price Index (general rate of inflation) since the 1980s, and that trend is unlikely to stop given the need for massive reinvestment in the systems as they age. Therefore, affordability issues for water and sewer are likely to sharpen, not diminish, in the coming decades, taking their place with continuing concerns about energy and telecommunications utility costs. The policy question is how to address these needs.

New Jersey water and sewer utility costs have reached levels that pose financial hardships for some households, even though almost no utilities currently exceed the USEPA thresholds for the Residential Indicator portion of utility affordability analyses. The fundamental problem is that the USEPA thresholds were created to determine whether financial stress on the utility would prevent that utility from achieving compliance with the Safe Drinking Water Act and Clean Water Act, given the median household income within their service area. The USEPA thresholds were not created to determine whether individual households were financially stressed by water and sewer rates. No national consensus exists regarding affordability thresholds for utility customers. USEPA is in the very early stages of assessing their current method for possible revision, including whether thresholds for household-level affordability are appropriate for national guidance.<sup>33</sup>

The results reported here show a wide range of utility costs for individual water and sewer utilities around New Jersey. Combined with household income data from the Census Bureau, utilities that have few utility-level issues regarding affordability almost uniformly have some areas with significant household affordability concerns, using the USEPA thresholds and concepts from other states and the research literature.

Affordability for water and sewer utility costs is part of the broader question about quality of life for households of modest means or less. Ideally, no one portion of household costs would be addressed independent of broader household finances. However, the nature of utility costs is that they are addressed through programs associated with the specific utility sector. Therefore, New Jersey will need to confront and answer the question of how to mitigate affordability problems associated with water and sewer utility costs.

The analyses for this report show that many utilities have a relatively high median income that higher-income households could reasonably aid households with high utility cost burdens, without an excessive burden on the ratepayers. However, some utilities have such a high concentration of affordability problems that they will need support from outside the utility. In addition, the vast majority of water and sewer utilities are small to very small; the administrative costs of establishing affordability programs could exceed the total cash outlay to help the households. Inefficiencies at that level would and should not be tolerated, but the only options would be to either exempt small utilities or develop large-scale programs that benefit the customers of small utilities without need for utility involvement.

Ultimately, affordability is or will be a major political constraint for utilities that must raise additional revenue to meet federal and state standards and industry norms for treatment and infrastructure management. The more households that can't pay for existing rates, the more backlash will ensue regarding proposed rate increases. Conversely, affordability programs can also be a major tool to

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<sup>33</sup> Personal communication with the USEPA Water Infrastructure and Resiliency Finance Center, 2018.

ensure that ratepayers are not overburdened relative to their income, imparting a sense of fairness to the rate system that will encourage setting of appropriate overall rates, sufficient to meet regulatory and system management needs; lower-income customers will know that they can receive support.

### Hotspots of Affordability Issues

While utility costs have reached or exceeded 2% of median household income for only two sewer utilities (Newark and Camden City), and none for water utilities, portions of nearly all utility service areas have pockets of low-income households that clearly do have affordability issues, regardless of the measurement approach. Using the USEPA 2% thresholds, more than 15% of New Jersey households would spend more than 2% of household income on each of water and sewer costs, and 4% for combined water and sewer utility costs, assuming that these households pay utility costs directly. Even if the 2% threshold is not found to be the best approach, the analysis is clear that most utilities have cost-burdened households, and for some utilities these households represent over 30% of all households. However, this finding must be evaluated in light of the high proportion of households in multi-family rental properties, which may not receive a direct bill. All counties are affected, with Camden and Essex (water and sewer) and Salem (water only) showing the greatest concerns. As shown in **Figures 5 through 12**, the highest proportions of cost-burdened households are concentrated in older urban areas, but they also exist in many other portions of the state.

### Research Needs

There are several important research issues that would benefit discussion and development of affordability programs:

- **Household Utility Assistance through Housing Programs:** The analyses of this report provide a sense of the total households that would experience affordability issues if they pay directly for the full costs of water and sewer utilities. However, some households at the lowest income levels receive housing assistance that either pays for water and sewer utilities or caps those costs. Therefore, some affordability needs have already been addressed through other subsidy programs, but that portion is not known. Research to understand the nature of available programs is being undertaken separately by the Natural Resources Defense Council (NRDC).
- **Household Utility Assistance through Utility and Other Programs:** Investor-owned utilities regulated by the NJ Board of Public Utilities may include funding for limited household financial assistance programs within their rate structure, and some have done so. Various programs provide financial assistance for housing (e.g., Section 8 of the U.S. Housing Act) that include utility costs. In addition, the rate structure for all utilities affects household affordability.<sup>34</sup> For example, utilities that rely heavily on fixed charges may have a regressive effect on low-income households that use less water, as conservation practices will have very limited impact on utility costs. Therefore, rate design decisions are an important component of household affordability impacts. Further research is needed on the extent to which existing assistance programs and rate designs mitigate household financial stress. Such research will help Jersey Water Works and others understand affordability issues that remain after all assistance programs are applied.

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<sup>34</sup> See, for example, Greg Clumpner's article "Social Justice and Water Rates: Impacts of Rate Design on Low-Income Customers", in the Journal of the American Water Works Association, July 2018, pp 48-52.

- **Households in Multi-family Housing:** The utility rates and annual costs for this report focused on residential customers, which equates to single-family units (attached or detached), where the households are directly billed by the utility. Research is needed to determine whether and the extent to which the annual costs of water and sewer utility services for multi-family housing differ from normal residential rates. Rutgers will collect rate information for multi-family housing from a selection of utilities with high concentrations of such housing. NRDC has expressed an interest in evaluating this information relative to their broader study.
- **Implications of Utility Costs for Rental Housing:** Many households do not pay water and sewer utility bills directly. Instead, the costs are included within the rents paid for housing. While it can be legitimately assumed that increased utility costs will be paid through the rents, a brief search found no available information on the elasticity of rental rates in response to increased utility costs. Where rental rates are constrained by market forces, landlords will be forced to reduce other expenses or to accept lower profit margins, as they cannot legally avoid payment. Further research is needed to understand whether increasing utility costs may shift rental property costs to the point where they become unaffordable at specific income levels.
- **Revenue Elasticity Relative to Utility Rate Increases:** The literature indicates that some utilities have seen an increase in nonpayment and late payment (arrears) as utility rates increase. Water demands may also decrease (in addition to demand reductions through ongoing conservation and water efficiency improvements),<sup>35</sup> offsetting some of the intended revenue gain from increased rates. No information was available from New Jersey utilities generally to indicate the extent to which these phenomena exist. One major utility that recently adopted a rate increase simultaneously adopted programs to improve payments and customer service; the combination resulted in higher payment rates, not lower, but it isn't possible to determine how each change affected the rate.<sup>36</sup> Affordability programs should reduce the rate of nonpayment or late payment, and so understanding the relationship between rates and arrearages is important.
- **Analysis of Rate Designs:** Evaluate the rate designs to determine the extent to which utilities, and especially higher-cost utilities, exacerbate affordability issues through rates designs that are regressive (i.e., charge a higher net amount per thousand gallons for low-volume users than for higher-volume users).
- **Net Cost Estimates for Affordability Program Scenarios:** Affordability programs will only be implemented if their costs are seen as affordable to the program sponsor, whether a utility or government. These programs can incur increased costs (e.g., administration, subsidies) but also can achieve increased revenue (e.g., partial payments where a customer previously provided no payment, reduced shut-off costs). In turn, the program costs must be acceptable to those who will provide the revenue necessary to subsidize lower-income households; usually, the revenue will come from other utility customers or taxpayers. Therefore, decision-makers will need to understand the relative costs of affordability program scenarios. As part of this research effort,

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<sup>35</sup> For example, see The Johnson Foundation at Wingspread and Alliance for Water Efficiency. 2012. Declining Water Sales and Utility Revenues: A Framework for Understanding and Adapting. National Water Rates Summit.

<sup>36</sup> Henning, Richard. 19 June 2018. Personal communication.

it would be valuable to understand the relationship between rate schedules, costs, shut-off rates, and lost revenues due to nonpayment.

### Policy Implications

There is no “perfect answer” regarding the thresholds for affordability. As in most policy debates, the focus will be on how to ensure that those most in need can be helped without making the program costs so high as to destroy public support for the system. The Low-Income Household Energy Assistance Program (LIHEAP) is a case in point, where most energy customers are likely not aware of their financial support for other households.

Evidence is clear from other areas of the country that increasing utility cost burdens will drive those of least means to stop paying utility bills. The result is that rates are pushed higher, resulting in more non-payments. Utilities that either directly support or benefit from robust household assistance programs have increased total revenue, because cost-burdened customers are able to pay what they can, instead of not paying at all on what they can’t afford. Affordability programs can also reduce administrative costs involved in seeking payment, threatening service loss, etc.

Some utilities have customer assistance programs that provide help for temporary situations, essentially for emergency conditions. These programs are not sufficient to address long-term affordability issues.

New Jersey will need to address the affordability issue for water and sewer costs. Two major options could be considered; portions of both could be useful.

1. **Utility Approach:** First, utilities should operate their systems in a manner that achieves the lowest feasible lifecycle costs (i.e., the lowest costs over a long period, not lower current costs through deferral of necessary expenses such as capital projects). Second, utilities should examine and design their rate schedules to maximize equity considerations. Third, new legislation could allow or require individual utilities to routinely reduce the bills for low-income households, to create utility-specific affordability programs. This approach requires a change in legislation, as currently there are only a few exceptions to the statutory requirements that all customers are charged uniformly relative to their customer class (e.g., residential) and usage. Guidance and clear standards would be needed for the utilities. As noted above, the administrative costs of establishing these programs would be excessive for the hundreds of small utilities, and so some portion of the customer population would not be addressed as these utilities will not adopt a voluntary program due to costs. In addition, some utilities will not be able to raise rates sufficiently to fund an effective program, due to a very low median household income within their service areas. Legislation has been proposed that would partially address these issues, but at this time no legislative proposal provides a complete response.
2. **Statewide Approach:** New Jersey could develop a statewide program similar to that for energy, where a small surcharge on all bills funds a statewide affordability program so that individual utilities do not need to establish their own programs. One advantage to a statewide program is that only one affordability approach is needed, rather than potentially hundreds. Another advantage is that individual utilities would not need to take on a function for which they are unprepared, and which is well outside of their current expertise. Finally, a statewide program could piggy-back on the existing energy assistance program, reducing administrative costs.

Addressing affordability at these levels will require a more complete compilation of utility rate schedules than was possible for this report. There currently is no state requirement that all utility post their rate schedules in a general-access site.<sup>37</sup> Many utilities only provide billing information to customers, and do not post their rate schedule at all. Some go so far, upon telephone inquiry, of only providing the rate schedule if an OPRA (Open Public Records Act) request is filed in writing. Utility rates should be public information, readily accessible to all. A state databased linking rate schedules to service areas would be most useful.

Another policy implication is regarding state funding support for water and sewer utilities. Low-interest loans and grants are often provided, couched in part in arguments that the funding lowers the costs for ratepayers relative to market financing of capital projects. Financial support of this sort for utilities helps reduced costs for all ratepayers, even though many will have ample ability to pay. As affordability increases as a problem and a constraint on appropriate rate-setting, New Jersey could focus financial support on affordability. Doing so will improve the financial viability of the utility, which will receive more revenue from stressed households, and will greatly reduce the impact of higher rates on those least able to afford them.

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<sup>37</sup> NJDEP regulations at N.J.A.C. 7:19-6.5(a)4 requires most water systems to “File water rate structures which provide incentives for water conservation with the Department [of Environmental Protection] and the Board of Public Utilities, as appropriate.” However, there is no schedule for submittal, and this information is not compiled and made available to the public.

## Conclusions

New Jersey is facing major capital project costs for water and sewer infrastructure over the next two to three decades, likely in the tens of billions of dollars for treatment plants, water distribution and sewage collection systems, and combined sewer overflow controls. Rates have been rising faster than inflation for decades and will continue to do so. The result is that poor households and those of modest means will increasingly be stressed financially by increasing water and sewer rates. While almost no New Jersey utilities currently exceed USEPA's thresholds for utility-level affordability, many households already face utility costs that stress their finances.

These household stresses can lead to lower utility revenues, as households fall behind on payments, and the household stresses should be expected to increase the potential for loss of housing. Our research clearly shows that affordability problems are not limited to a few areas, but rather exist in a wide array of utilities. In turn, these financial stresses will exacerbate political opposition to necessary rate increases that address aging and failing infrastructure and improve treatment levels in compliance with state and federal standards for important drinking water and ambient water quality problems.

For these reasons, New Jersey needs to address the affordability issue before it becomes even more critical. No national consensus exists on what level of household financial stress should be considered excessive, but other programs and ideas from the literature provide a starting point for discussion. In the final analysis, New Jersey's answer will involve a combination of analysis with policy decisions on what constitutes an intolerable burden on households, and what program costs are considered reasonable. This report provides an initial basis for discussion of these issues.

## About the Project Team

### Daniel J. Van Abs Ph.D. PP, AICP

Dan is an Associate Professor of Practice for Water, Society & Environment at Rutgers University's School of Environmental and Biological Sciences, where he focuses on planning and management policy for water infrastructure, water supply, wastewater and watershed protection. Previously, he was senior director for planning and science with New Jersey's Highlands Water Protection and Planning Council, and was director of watershed protection with the New Jersey Water Supply Authority. He served with the New Jersey Department of Environmental Protection for 12 years, six as manager for statewide water resources planning; and as technical director of the Passaic River Coalition for four years. Dan holds a Ph.D. in Environmental Science from SUNY-College of Environmental Science and Forestry. He is a licensed Professional Planner in New Jersey and former chairman of the New Jersey Clean Water Council. Dan is co-editor with Karen O'Neill of the June 2016 Rutgers University Press book *Taking Chances: The Coast After Sandy*.

Dan developed the project approach, supervised collection and evaluation of water and sewer rate information, developed affordability assessments for several of the methods, and prepared all parts of the report except Appendix A.

### Tim Evans, Research Director, New Jersey Future

Tim is responsible for the original research and data analysis that support New Jersey Future's policy development. He regularly documents his research results in a variety of products, including full-length research reports and the *Future Facts* electronic newsletter. He also ensures that all of New Jersey Future's products and media communications are accurate and defensible from a quantitative standpoint. Tim frequently provides data and advice to colleague organizations, serving as an informal research consultant to the smart growth community at large. His analysis and commentary have been featured by a wide range of state and national media outlets.

Tim holds a B.S. in mathematics from Ursinus College, an M.S. in statistics from the University of Virginia, and a master's in city and regional planning from the Bloustein School of Planning and Public Policy at Rutgers University. Prior to joining New Jersey Future, Tim worked for six years as a mathematical statistician for the Bureau of the Census in Washington D.C.

Tim developed the analytical model for and assessed the household water and sewer costs relative to various household income metrics (median, income cohorts).

### Chris Sturm, Managing Director for Policy and Water, New Jersey Future

Chris served as project manager for this research study. She helped to shape the research questions and approach, edit this report, and keep the project moving. Among other roles, she provides staff leadership for all New Jersey Future staff who support the Jersey Water Works Steering Committee and topic committees.

The authors wish to thank the New Jersey Future interns from Rutgers University who acquired and analyzed the water and sewer utility costs for this project:

- Zachary Adams
- Emily Nanneman
- Sean O'Rourke
- April Rastaetter
- Zhaohan Yan (including work as an Aresty Research Scholar with Professor Van Abs)

Jiayi Ding, MCRP, of Rutgers University provided GIS services for this project, which were the foundation for the analysis of utility service areas relative to census tracts, and for mapping the project results used in this report.

## Jersey Water Works

Jersey Water Works is a collaborative effort of [many diverse organizations and individuals](#) who embrace the common purpose of transforming New Jersey's inadequate water infrastructure by investing in sustainable, cost-effective solutions that provide communities with clean water and waterways; healthier, safer neighborhoods; local jobs; flood and climate resilience; and economic growth. [Jersey Water Works' shared goals](#) are end states the collaborative aims to help achieve over the next three to five years. The [2018 Work Plan](#) is executed by the collaborative's committees. The projects will advance best practices, better stakeholder engagement, and affordability for all ratepayers, among other goals. Jersey Water Works includes hundreds of members: water and sewer utilities, governments, businesses, non-governmental organizations, consultants, academics, individuals and others.

## New Jersey Future

Founded in 1987, New Jersey Future is a nonprofit, nonpartisan organization that promotes sensible growth, redevelopment and infrastructure investments to foster vibrant cities and towns, protect natural lands and waterways, enhance transportation choices, provide access to safe, affordable and aging-friendly neighborhoods and fuel a strong economy. The organization does this through original research, innovative policy development, coalition-building, advocacy, and hands-on strategic assistance. New Jersey Future provides the backbone staff and serves as fiscal agent for Jersey Water Works.

## Appendix A – Spreadsheet Development

### Geography and Data Availability

This appendix provides detail about the methodology used in constructing the spreadsheet for developing comparisons of utility costs (based on an annual water usage of 60,000 gallons per household) with household incomes. Household income distributions are available at the census tract level from the American Community Survey (ACS). Per-household utility costs were collected from individual water and sewer utilities, whose service areas do not necessarily respect municipal or tract boundaries, nor do they respect one another (that is, a single water utility service area can incorporate parts of multiple sewer service areas, and vice versa). Direct comparisons of these data items must be done at a unit of geography over which the values of the data items do not vary.

In particular, we are interested in estimating, at various levels of geography, the number and percentage of households for which utility costs exceed certain threshold percentages as a percent of household income. Since one of the comparisons involves the total utility bill (water and sewer combined), we must perform the calculations of the number of such households at a level where the water and sewer charges remain constant.

To produce a basic unit of geography over which comparisons can be made, a GIS analysis was performed, in which the following GIS layers were intersected:

- Census tracts
- Water service areas (PWSID)
- Sewer service areas (NJPDES)

The polygons that result from this intersection are the largest unit of geography over which the values of all three key variables – household incomes (from the census tract layer), per-household water charges (from the water service area layer), and per-household sewer charges (from the sewer service area layer) – remain constant. These polygons represent the geographic building blocks for all further analysis; the counts of households exceeding the affordability thresholds can be cumulated from the polygon level to any higher level of geography simply by summing the polygons by the value of the identifier for that geography (municipality, county, state, utility service area).

In reality, not every polygon output record created by the intersection process had a unique combination of the three parent variables, but polygons with the same values of all three variables can conceptually be thought of as dissolvable into larger polygons where the combination of tract x PWSID x NJPDES serves as a unique identifier. We will hereafter use “polygon” to refer to each unique combination of tract x PWSID x NJPDES, with the acknowledgement that there were in reality some instances where multiple distinct GIS polygons actually had the same values of all three of the intersection variables.

### Creating Polygon-Level Income Distributions

In addition to identifying a polygon’s values of each of the three parent GIS layers, the data record for each polygon created by the intersection process also contained several other variables pertaining to

each of the parent layers (e.g. facility names, service area land areas), plus two variables that pertain to the individual polygon itself:

- the area (in square footage) of the polygon; and
- an estimated 2010 population of the polygon, derived by Rutgers through dasymetric analysis of the Census data and residential land use categories in the 2012 Land Use/Land Cover mapping by the NJDEP; within a tract, population was apportioned to the constituent polygons based on how much residential development was located in each polygon as observed on the land development layer

Knowing which census tract a polygon is contained in allows us to link the polygon to any Census Bureau data item that is available at the tract level. But because our basic analysis is at the polygon level, we need to have some method of apportioning a given census tract's people, households, or housing units (the three basic tabulation variables used in Census Bureau demographic data) among all of the tract x PWSID x NJPDES polygons that comprise the tract. The key GIS output variable in the polygon record that allows us to do this is the estimated 2010 population of the polygon.

If we take a polygon's estimated 2010 population as a fraction of the total 2010 population of the polygon's host census tract, this gives us a weighting factor that serves as a reasonable estimate of what fraction of the tract this polygon represents, in terms of any variable that is expressed as a count of people, households, or housing units. For example, if a given polygon's estimated 2010 population is 20 percent of its host tract's total population, we then assume that the polygon contains 20 percent of the tract total of everything else. And for data items that are presented in terms of percentages or summary statistics (like a median or an average) rather than raw counts, we make the similar assumption that the percentages or summary values for a polygon are identical to the values for the host tract. In short, we are assuming that each polygon mimics the profile and behavior of its host census tract on all tract-level data items for which we want to produce polygon-level estimates.

We also assume that the polygon's share of its host tract remains constant over time, so that we can use the polygon's weighting factor to create polygon-level estimates for data items published in later years. In particular, because our water and sewer cost data is from 2017, we used the most recent income data available, from the 2012-2016 five-year ACS, to make the comparison as current as possible. In applying a polygon's weighting factor, which was constructed using 2010 Census data, to its host tract's 2016 population or household counts in order to create polygon-level estimates for 2016, we are assuming that whatever fraction of its host tract's population the polygon accounted for in 2010, it accounts for that same fraction of the tract's population and households in 2016. In other words, we are effectively assuming that a tract's population growth (or loss) occurred uniformly throughout the tract, that all parts of the tract gained (or lost) population and households at the same rate.

The polygon weighting factors were applied to tract-level household income distributions to create approximate 2016 income distributions at the polygon level, with the number of households falling into each standard income range at the tract level multiplied by the weighting factor to produce counts of households by income range for the polygon.

### **Estimating Median Household Income for Utility Service Areas**

Polygon-level income distributions were used to produce approximate income distributions for each water and sewer service area, by cumulating the distributions (that is, by summing the household counts for each income range) over all polygons contained in the utility service area. (The weighting factors often produced fractional numbers of households in each income range at the polygon level; when polygon estimates were cumulated to the utility service level, the totals were simply rounded to the nearest whole number.) Estimates of median household income for each utility service area were then derived by finding the approximate midpoint of the utility area's approximated income distribution. This was accomplished through the following steps:

- Determine which income range contains the middle household in the distribution (the median is defined as the point having half the distribution below it and half above it):
  - Create cumulative household counts for each income range, beginning with the lowest range, by adding the number of households in that range to the total number of households already tallied in all lower income ranges
  - Identify the income range for which the cumulative household count first exceeds half the number of households in the entire utility service area; this is the range that contains the median value
- Compute the fraction of that income range's households that need to be added to the cumulative household count for the preceding range in order to hit exactly half the households in the utility service area
- Multiply that fraction by the width of the income range (the difference between the upper and lower endpoints of the range), and add that dollar amount to the lower endpoint of the range. The implicit assumption (not actually accurate, but close enough to produce a reasonable estimate) is that households are distributed uniformly within the income range, so that whatever portion of the households in the range must be added to the running total before hitting the middle household (i.e. half the number of households in the entire utility service area), adding the same portion of the width of the income range to the range's lower endpoint will yield a good approximation of the utility service area's middle income.

### **Estimating Number of Households Having Utility Costs Exceeding Prescribed Affordability Percentages**

A similar technique was used in estimating what percent of the households in a given geographic area (state, county, municipality, or utility service area) are paying more than a given percentage of their income on utility costs. This was done by estimating the number of such households at the polygon level, using the approximated polygon-level income distribution and the appropriate utility charges, and summing the resulting household counts over all polygons in the geographic area of interest. At the polygon level, the number of households facing utility affordability issues was estimated as follows:

- Use the per-household cost data from the polygon's host utility(ies) and the affordability thresholds (2% for water; 2% and 2.5% for sewer; 4% and 4.5% for water and sewer combined) to determine a set of five minimum income points (one for each percentage being evaluated) below which a household would be paying more than that threshold percentage of its income on utility bill(s) and would therefore be considered to be paying unaffordable utility costs.

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These minimum incomes are simply the utility charge (water, sewer, or the sum of the two) multiplied by the inverse of the threshold percent. So the minimum incomes are:

- 50 x the per-household water charge
- 50 x the per-household sewer charge [for the 2% cutoff]
- 40 x the per-household sewer charge [for the 2.5% cutoff]
- 25 x combined water and sewer per-household charges [for the 4% cutoff]
- 22.222 x combined water and sewer per-household charges [for the 4.5% cutoff]
- For each of these minimum income points, determine which income range in the polygon's approximate income distribution contains the minimum affordability income
- Sum up the household counts for all income ranges below the range containing the minimum affordability income
- In the range containing the minimum affordability income, compute the fraction of the width of that range (the difference between the upper and lower endpoints of the range) that falls below the minimum affordability income
- Multiply this fraction by the number of households in the income range containing the minimum affordability income
- Add this household count to the sum of the household counts over all lower income ranges

These polygon-level counts of households paying unaffordable utility bills (water, sewer, or combined) can now be summed to produce estimates at higher levels of geography.

## Appendix B – Utility Rates and Household Costs

A listing and information regarding the drinking water and sewer utilities of New Jersey were provided by the New Jersey Department of Environmental Protection. Each type of utility was sorted by priority.

For drinking water utilities, the priorities were established by total capacity to deliver water, with the largest utilities of 5 million gallons per day (MGD) capacity or greater being high priority, utilities with greater than 2 MGD being medium priority, utilities with greater than 0.333 MGD capacity being low priority, and all smaller utilities being not a priority. Rate information was compiled by the Rutgers team for all high priority and most moderate priority utilities. Rate information for low priority utilities was compiled for a random selection of utilities, and as available using investor-owned rate schedules. The drinking water utilities rates variously included fixed charges, volumetric charges or both, and in the case of investor-owned utilities often included purchased water agreement charges and DSIC (Distribution System Investment Charges) components as well. Therefore, household water costs per volume demand for many systems are not proportional to demand; as demand volumes drop, the fixed charges remain the same and become a larger and larger portion of the total cost. Household costs were determined for 60,000, 45,000, 30,000 and 15,000 gallons of annual demand.

For sewer utilities, high priority was placed on systems with Combined Sewer Overflows (CSOs), the largest non-regional systems, and all collection systems that flow to regional treatment plants. The last5 category provided the greatest challenges, as regional systems can serve dozens of municipalities. Therefore, high priority applied to over 300 systems. Sewer rates were less readily available than drinking water utility rates, overall. In some cases, both the municipal collection systems and the regional treatment plant utility charge independent rates, some municipalities bundled the regional and municipal costs into a single rate schedule, and in other cases all residential sewer costs are paid through the general municipal budget using property taxes. Every effort was made to gather rate information for all high priority systems. As with drinking water utilities, sewer utility rates variously included fixed charges, volumetric charges, or both. (Very few sewer utilities are owned by investor-owned utilities.) Volumetric charges are more difficult for sewer utilities that do not have access to water demand data. Therefore, household sewer costs per volume demand for many systems are not proportional to demand; as demand volumes drop, the fixed charges remain the same and become a larger and larger portion of the total cost. Household costs were determined for 60,000, 45,000, 30,000 and 15,000 gallons of annual demand.

The following tables show the utilities for which rate information was collected, the rate components, and the estimated household costs at 60,000, 45,000, 30,000 and 15,000 gallons per year. In each case, every effort was made to properly construe the rate components, but there is some potential for inaccurate interpretations as some rate schedules were difficult to evaluate.

While the project team attempted to ensure correct utility cost information, new information is being collected continuously. Any corrected 2017 cost estimates identified through August 2018 are reflected in Appendix B, but the methodology analyses are based on the initial cost estimates (through February 2018) due to time and budget limitations. **Any necessary corrections** should be provided to Daniel J. Van Abs, at [vanabs@sebs.rutgers.edu](mailto:vanabs@sebs.rutgers.edu). New rate schedules (e.g., for missing utilities or for changes since the 2017 rates) may also be provided, as they will be useful for future affordability assessments using the consensus methodology to be developed.

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**Table 15. Drinking Water Utility Rates and Estimated Household Costs**

PWSID #	County	Name	Base Charge (quarterly, smallest residential meter size)	Volume Charge (15K gallons per quarter)	Purchased Water Adjustment Clause Charge (Annual)	Distribution System Improvement Charge (DSIC) (Annual)	Energy & Treatment Recovery Clause	Additional Charges	Total Cost (60K gallons per year)	Total Cost (45K gallons per year)	Total Cost (30K gallons per year)	Total Cost (15K gallons per year)
2004002	Union	<b>New Jersey American Water Company - Raritan System</b>										
		Water Service Area 1	\$40.80	\$92.98	\$27.24	\$35.28			\$597.65	\$497.86	\$398.06	\$298.27
		Water Service Area 2	\$40.80	\$92.25	\$27.24	\$35.28			\$594.71	\$495.65	\$396.59	\$297.54
0238001	Bergen	Suez - Haworth	\$34.50	\$86.18					\$482.72	\$396.54	\$310.36	\$224.18
1605002	Passaic	<b>Passaic Valley Water Commission</b>	\$69.09	\$41.31					\$441.60	\$400.29	\$358.98	\$317.67
0714001	Essex	Newark Water Department	\$30.90	\$61.96					\$371.44	\$309.48	\$247.52	\$185.56
1345001	Monmouth	<b>New Jersey American Water Company - Coastal North</b> Water Service Area 1	\$40.80	\$93.00	\$27.24	\$35.28			\$597.71	\$497.90	\$398.09	\$298.29
1225001	Middlesex	Middlesex Water Company	\$45.30	\$83.64					\$515.76	\$432.12	\$348.48	\$264.84
0906001	Hudson	<b>Jersey City MUA - SUEZ</b>	\$34.50	\$86.18					\$482.71	\$396.53	\$310.35	\$224.18
0712001	Essex	New Jersey American Water Company - Short Hills	\$12.50	\$93.80					\$425.20	\$331.40	\$237.60	\$143.80
0327001	Burlington	<b>New Jersey American Water Company - Western Division</b>										
		Water Service Area 1	\$40.80	\$93.00	\$27.24	\$35.28			\$597.71	\$497.90	\$398.09	\$298.29
		Water Service Area 3	\$40.80	\$90.80	\$27.24	\$35.28			\$588.92	\$491.31	\$393.70	\$296.09
1111001	Mercer	Trenton Water Works	\$46.24	\$42.43					\$354.68	\$312.25	\$269.82	\$227.39
0119002	Atlantic	<b>New Jersey American Water Company - Atlantic</b> Water Service Area 1	\$40.80	\$93.00	\$27.24	\$35.28			\$597.71	\$497.90	\$398.09	\$298.29
1507005	Ocean	Suez - Toms River	\$34.50	\$106.91					\$565.65	\$458.74	\$351.83	\$244.91
0102001	Atlantic	<b>Atlantic City MUA - Class R-1 - 1-2 Dwelling Units</b>	\$45.00						\$180.00	\$180.00	\$180.00	\$180.00
1214001	Middlesex	New Brunswick Water Department		\$91.62					\$366.46	\$274.85	\$183.23	\$91.62
1506001	Ocean	<b>Brick Township MUA</b>	\$22.63	\$51.75					\$297.52	\$245.77	\$194.02	\$142.27
2004001	Union	Liberty Water Company	\$40.80	\$90.05					\$523.40	\$433.35	\$343.30	\$253.25
0251001	Bergen	<b>Ridgewood Water Department</b>	\$25.57	\$70.35					\$383.68	\$313.33	\$242.98	\$172.63

Assessing the Affordability of Water and Sewer Utility Costs in New Jersey

PWSID #	County	Name	Base Charge (quarterly, smallest residential meter size)	Volume Charge (15K gallons per quarter)	Purchased Water Adjustment Clause Charge (Annual)	Distribution System Improvement Charge (DSIC) (Annual)	Energy & Treatment Recovery Clause	Additional Charges	Total Cost (60K gallons per year)	Total Cost (45K gallons per year)	Total Cost (30K gallons per year)	Total Cost (15K gallons per year)
0408001	Camden	Camden City Water Department <sup>38</sup>		\$45.25					\$181.00	\$135.75	\$90.50	\$45.25
0614003	<b>Cumberland</b>	<b>Vineland City Water and Sewer Utility</b>	\$29.88	\$13.62			\$2.25		\$176.25	\$162.63	\$149.01	\$135.39
1209002	Middlesex	Old Bridge Township MUA	\$70.20	\$48.15					\$473.40	\$425.25	\$377.10	\$328.95
1424001	<b>Morris</b>	<b>Southeast Morris County MUA</b>	\$19.91	\$58.40					\$313.24	\$254.84	\$196.44	\$138.04
0901001	Hudson	Bayonne City Water Department - SUEZ	\$34.50	\$86.18					\$482.71	\$396.53	\$310.35	\$224.18
1204001	<b>Middlesex</b>	<b>East Brunswick Water Utility</b>	\$0.00	\$54.00					\$216.00	\$162.00	\$108.00	\$54.00
0907001	Hudson	Kearny Town Water Department - North Jersey District Water Supply Commission	\$20.00	\$90.84					\$443.36	\$352.52	\$261.68	\$170.84
0705001	<b>Essex</b>	<b>East Orange Water Commission</b>		\$84.02					\$336.10	\$252.07	\$168.05	\$84.02
1614001	Passaic	Wayne Township Division of Water	\$22.00	\$82.95					\$419.80	\$336.85	\$253.90	\$170.95
1808001	<b>Somerset</b>	<b>Franklin Township Department Public Works</b>	\$50.00	\$47.50					\$390.00	\$342.50	\$295.00	\$247.50
0424001	Camden	Merchantville Pennsauken Water Commission	\$24.25	\$45.12					\$277.48	\$232.36	\$187.24	\$142.12
1213002	<b>Middlesex</b>	<b>Monroe Township Utility Department</b>										
		Resident A	\$13.28	\$26.85					\$160.52	\$133.67	\$106.82	\$79.97
		Resident B - w/o electronic radio transmitter	\$38.28	\$26.85					\$260.52	\$233.67	\$206.82	\$179.97
0514001	Cape May	Wildwood City Water Department	\$24.85	\$37.65					\$250.00	\$212.35	\$174.70	\$137.05
1221004	<b>Middlesex</b>	<b>South Brunswick Township Water Company</b>	\$15.03	\$45.15					\$240.72	\$195.57	\$150.42	\$105.27
1219001	Middlesex	Sayreville Borough Water Department	\$25.15	\$81.91					\$428.23	\$346.32	\$264.42	\$182.51
1429001	<b>Morris</b>	<b>Parsippany - Troy Hills</b>	\$23.25	\$13.60				\$0.15	\$147.55	\$133.95	\$120.35	\$106.75
0702001	Essex	Bloomfield Water Department	\$29.36	\$98.33					\$510.74	\$412.41	\$314.08	\$215.75
1339001	<b>Monmouth</b>	<b>Shorelands Water Company</b>	\$42.00	\$71.61					\$454.44	\$382.83	\$311.22	\$239.61
1328002	Monmouth	Marlboro Township MUA	\$32.00	\$52.35					\$337.40	\$285.05	\$232.70	\$180.35

<sup>38</sup> This rate includes the city portion of sewer costs – Camden County MUA charges customers directly for its costs.

Assessing the Affordability of Water and Sewer Utility Costs in New Jersey

PWSID #	County	Name	Base Charge (quarterly, smallest residential meter size)	Volume Charge (15K gallons per quarter)	Purchased Water Adjustment Clause Charge (Annual)	Distribution System Improvement Charge (DSIC) (Annual)	Energy & Treatment Recovery Clause	Additional Charges	Total Cost (60K gallons per year)	Total Cost (45K gallons per year)	Total Cost (30K gallons per year)	Total Cost (15K gallons per year)
1205001	Middlesex	<b>New Jersey American Water Company - Edison</b>										
		Water Service Area 1	\$40.80	\$93.00	\$27.24	\$35.28		\$597.71	\$497.90	\$398.09	\$298.29	
		Water Service Area 2	\$40.80	\$92.25	\$27.24	\$35.28		\$594.71	\$495.65	\$396.59	\$297.54	
1316001	Monmouth	Freehold Township Water Department	\$26.94	\$9.12				\$144.24	\$135.12	\$126.00	\$116.88	
0323001	Burlington	New Jersey American Water Company - Mount Holly	\$40.80	\$92.85	\$27.24	\$35.28		\$597.12	\$497.46	\$397.80	\$298.14	
0818004	Gloucester	Washington Township	\$22.00	\$8.50				\$122.00	\$113.50	\$105.00	\$96.50	
0324001	Burlington	Mount Laurel Township <sup>39</sup>	\$0	\$46.35				\$185.40	\$139.05	\$92.70	\$46.35	
1103001	Mercer	Aqua New Jersey - Hamilton Square	\$42.99	\$87.07				\$520.24	\$433.17	\$346.10	\$259.03	
1326001	Monmouth	Gordons Corner Water Company	\$14.06	\$77.25	\$2.70			\$367.94	\$290.02	\$212.09	\$134.17	
1215001	Middlesex	North Brunswick Water Department - NJAWC	\$34.80	\$52.70				\$350.00	\$297.30	\$244.60	\$191.90	
0713001	Essex	Montclair Water Department	\$33.00	\$33.17				\$264.68	\$231.51	\$198.34	\$165.17	
1511001	Ocean	Jackson Township MUA	\$32.00	\$37.75				\$279.00	\$241.25	\$203.50	\$165.75	
0415002	Camden	Aqua New Jersey - Blackwood System	\$14.33	\$87.00				\$405.32	\$318.32	\$231.32	\$144.32	
2013001	Union	Suez - Rahway	\$34.50	\$86.18				\$482.71	\$396.53	\$310.35	\$224.18	
0508001	Cape May	New Jersey American Water Company - Ocean City	\$40.80	\$92.85	\$27.24	\$35.28		\$597.12	\$497.46	\$397.80	\$298.14	
0338001	Burlington	Willingboro MUA	\$56.50	\$15.20				\$286.80	\$271.60	\$256.40	\$241.20	
1216001	Middlesex	Perth Amboy Department of Municipal Utilities	\$22.29	\$89.23				\$446.09	\$356.86	\$267.62	\$178.39	
0313001	Burlington	Evesham Township	\$12.00	\$27.75				\$159.00	\$131.25	\$103.50	\$75.75	
0710001	Essex	Livingston Township Water Division	\$15.75	\$14.92				\$122.68	\$107.76	\$92.84	\$77.92	
0217001	Bergen	Fair Lawn Water Department	\$20.00	\$84.00				\$416.00	\$332.00	\$248.00	\$164.00	
1514002	Ocean	Lakewood Township MUA	\$44.75	\$16.65				\$245.60	\$228.95	\$212.30	\$195.65	
0322001	Burlington	Moorestown Water Department	\$9.00	\$45.00				\$216.00	\$171.00	\$126.00	\$81.00	

<sup>39</sup> Where a utility is highlighted in yellow, the costs have been modified since the July 2018 draft report.

Assessing the Affordability of Water and Sewer Utility Costs in New Jersey

PWSID #	County	Name	Base Charge (quarterly, smallest residential meter size)	Volume Charge (15K gallons per quarter)	Purchased Water Adjustment Clause Charge (Annual)	Distribution System Improvement Charge (DSIC) (Annual)	Energy & Treatment Recovery Clause	Additional Charges	Total Cost (60K gallons per year)	Total Cost (45K gallons per year)	Total Cost (30K gallons per year)	Total Cost (15K gallons per year)
0610001	Cumberland	Millville Water Department	\$30.00	\$17.50					\$190.00	\$172.50	\$155.00	\$137.50
0905001	<b>Hudson</b>	<b>Hoboken Water Services -SUEZ</b>	\$34.50	\$86.18					\$482.71	\$396.53	\$310.35	\$224.18
0233001	Bergen	Mahwah Water Department	\$0.00	\$67.98					\$271.91	\$203.93	\$135.95	\$67.98
1326004	Monmouth	Suez - Matchaponix System	\$34.50	\$86.18					\$482.71	\$396.53	\$310.35	\$224.18
0811002	Gloucester	Monroe Township MUA	\$0.00	\$95.00					\$380.00	\$285.00	\$190.00	\$95.00
2119001	Warren	Aqua New Jersey - Phillipsburg	\$42.99	\$87.07					\$520.24	\$433.17	\$346.10	\$259.03
0802001	Gloucester	Deptford Township MUA	\$0.00	\$59.25					\$237.00	\$177.75	\$118.50	\$59.25
1533001	Ocean	Barnegat Township Water and Sewer Utilities	\$0.00	\$43.00					\$172.00	\$129.00	\$86.00	\$43.00
1101002	Mercer	East Windsor MUA	\$20.06	\$32.85					\$211.65	\$178.80	\$145.95	\$113.10
0706001	Essex	Essex Fells Borough	\$0.00	\$78.75					\$315.00	\$236.25	\$157.50	\$78.75
0719001	Essex	South Orange Water Department	\$0.00	\$77.70					\$310.80	\$233.10	\$155.40	\$77.70
0820001	Gloucester	West Deptford Township Water Department	\$0.00	\$67.50					\$270.00	\$202.50	\$135.00	\$67.50
0436007	<b>Camden</b>	<b>Winslow Township</b>	\$0	\$105.00					\$420.00	\$420.00	\$420.00	\$420.00
1518005	Ocean	<b>Manchester Township Water Utility</b>										
		Eastern Service Area	\$11.60	\$31.50					\$172.40	\$140.90	\$109.40	\$77.90
		Western Service Area	\$25.57	\$41.10					\$266.68	\$225.58	\$184.48	\$143.38
0717001	Essex	Orange Water Department	\$0.00	\$79.67					\$318.67	\$239.00	\$159.34	\$79.67
1352003	Monmouth	Wall Township Water Department	\$0.00	\$94.34					\$377.36	\$283.02	\$188.68	\$94.34
0601001	Cumberland	Bridgeton City Water Department	\$0.00	\$25.00					\$100.00	\$75.00	\$50.00	\$25.00
0247001	Bergen	Park Ridge Water Department	\$14.00	\$57.90					\$287.60	\$229.70	\$171.80	\$113.90
0701001	Essex	Belleville Township Water Department	\$24.50	\$59.00					\$333.98	\$137.36	\$117.68	\$98.00
0716001	Essex	Nutley Water Department	\$0.00	\$85.01					\$340.04	\$255.03	\$170.02	\$85.01
0103001	Atlantic	Brigantine Water Department	\$0.00	\$70.00					\$280.00	\$210.00	\$140.00	\$70.00
1421003	Morris	Montville Township MUA	\$0.00	\$69.75					\$279.00	\$209.25	\$139.50	\$69.75
0112001	Atlantic	Hamilton Township MUA	\$0.00	\$57.75					\$231.00	\$173.25	\$115.50	\$57.75
0806001	<b>Gloucester</b>	<b>Glassboro Water Department</b>	\$0	\$82.10					\$328.40	\$256.40	\$194.00	\$194.00

## Assessing the Affordability of Water and Sewer Utility Costs in New Jersey

PWSID #	County	Name	Base Charge (quarterly, smallest residential meter size)	Volume Charge (15K gallons per quarter)	Purchased Water Adjustment Clause Charge (Annual)	Distribution System Improvement Charge (DSIC) (Annual)	Energy & Treatment Recovery Clause	Additional Charges	Total Cost (60K gallons per year)	Total Cost (45K gallons per year)	Total Cost (30K gallons per year)	Total Cost (15K gallons per year)
0221001	Bergen	Garfield City Water Department	\$0.00	\$45.92					\$183.66	\$137.75	\$91.83	\$45.92
1340001	Monmouth	Red Bank Water Department	\$44.00	\$106.65					\$602.60	\$495.95	\$389.30	\$282.65
1604001	Passaic	Hawthorne Borough Water Dept	\$0.00	\$79.74					\$318.96	\$239.22	\$159.48	\$79.74
1530004	Ocean	Stafford Township MUA - Beach	\$61.00	\$15.80					\$307.20	\$291.40	\$275.60	\$259.80
0232001	Bergen	Lyndhurst Water Department	\$19.00	\$76.20					\$380.79	\$304.59	\$228.40	\$152.20
1512001	Ocean	Lacey Township MUA	\$34.76	\$80.70					\$461.84	\$381.14	\$300.44	\$219.74
2108001	Warren	Hackettstown MUA w/Diamond Hill	\$21.00	\$34.50					\$222.00	\$187.50	\$153.00	\$118.50
1409001	Morris	Dover Water Commission	\$17.69	\$64.20					\$327.57	\$263.37	\$199.17	\$134.96
0116001	Atlantic	Margate City Water Department	\$0.00	\$97.50					\$390.00	\$292.50	\$195.00	\$97.50
0502001	Cape May	Cape May Water and Sewer	\$0.00	\$118.75					\$475.00	\$356.25	\$237.50	\$118.75
1516001	Ocean	Little Egg Harbor MUA	\$0.00	\$52.00					\$208.00	\$156.00	\$104.00	\$52.00
1524001	Ocean	Point Pleasant Water Department <sup>40</sup>	\$67.00	\$117.75					\$739.00	\$621.25	\$503.50	\$385.75
0505002	Cape May	Lower Township MUA	\$0.00	\$80.53					\$322.12	\$241.59	\$161.06	\$80.53
1410001	Morris	East Hanover Township Water Dept	\$25.00	\$22.50					\$190.00	\$167.50	\$145.00	\$122.50
0113001	Atlantic	Hammonton Water Department	\$0.00	\$95.66					\$382.66	\$286.99	\$191.33	\$95.66
0303001	Burlington	Bordentown Water Department	\$86.12	\$44.40					\$522.08	\$477.68	\$433.28	\$388.88
0501001	Cape May	Avalon Water and Sewerage Utilities	\$0.00	\$60.25					\$241.00	\$180.75	\$120.50	\$60.25
0220001	Bergen	Suez NJ-Franklin Lakes	\$34.50	\$86.18					\$482.71	\$396.53	\$310.35	\$224.18
1431001	Morris	Pequannock Township Water Dept	\$5.00	\$60.00					\$260.00	\$200.00	\$140.00	\$80.00
1417001	Morris	Madison Water Department	\$20.29	\$0.62					\$83.65	\$83.03	\$82.41	\$81.78
1432003	Morris	Randolph Township Water Division	\$20.00	\$56.25					\$305.00	\$248.75	\$192.50	\$136.25
1517001	Ocean	Long Beach Township - Brant Beach	\$0.00	\$0.00					\$152.00	\$152.00	\$152.00	\$152.00
1408001	Morris	Denville Township Water Department	\$0.00	\$83.55					\$334.20	\$250.65	\$167.10	\$83.55
1612001	Passaic	Totowa Water Department	\$0.00	\$75.90					\$303.60	\$227.70	\$151.80	\$75.90
0405001	Camden	Berlin Water Department	\$0.00	\$51.50					\$206.00	\$154.50	\$103.00	\$51.50

<sup>40</sup> This rate reflects a combined water and sewer bill from Point Pleasant Borough. No separation of rates exists.

Assessing the Affordability of Water and Sewer Utility Costs in New Jersey

PWSID #	County	Name	Base Charge (quarterly, smallest residential meter size)	Volume Charge (15K gallons per quarter)	Purchased Water Adjustment Clause Charge (Annual)	Distribution System Improvement Charge (DSIC) (Annual)	Energy & Treatment Recovery Clause	Additional Charges	Total Cost (60K gallons per year)	Total Cost (45K gallons per year)	Total Cost (30K gallons per year)	Total Cost (15K gallons per year)
0808001	Gloucester	New Jersey American Water Company - Harrison System	\$40.80	\$90.80	\$27.24	\$35.28			\$588.92	\$491.31	\$393.70	\$296.09
0412001	Camden	Collingswood Water Department	\$27.00	\$60.16					\$348.62	\$288.47	\$228.31	\$168.16
0242001	Bergen	Oakland Water Department	\$0.00	\$73.40					\$293.60	\$220.20	\$146.80	\$73.40
0803001	Gloucester	East Greenwich Township Water Dept	\$0.00	\$99.75					\$399.00	\$299.25	\$199.50	\$99.75
0720001	Essex	Verona Water Department	\$0.00	\$65.85					\$263.40	\$197.55	\$131.70	\$65.85
0707001	Essex	Fairfield Township Water Department		\$59.00					\$303.48	\$244.48	\$185.48	\$126.48
1605001	Passaic	New Jersey American Water Company - Little Falls	\$40.80	\$93.00	\$27.24	\$35.28			\$597.71	\$497.90	\$398.09	\$298.29
0809002	Gloucester	New Jersey American Water Company - Logan System	\$40.80	\$93.00	\$27.24	\$35.28			\$597.71	\$497.90	\$398.09	\$298.29
0809001	Gloucester	New Jersey American Water Company - Bridgeport System	\$40.80	\$67.48	\$27.24	\$35.28			\$495.65	\$421.36	\$347.06	\$272.77
0509001	Cape May	Sea Isle City Water Dept	\$0.00	\$82.00					\$328.00	\$246.00	\$164.00	\$82.00
0315001	Burlington	Florence Township		\$86.77					\$347.08	\$260.31	\$173.54	\$86.77
1518004	Ocean	Manchester Township Water Utilities - Western	\$25.57	\$41.10					\$266.68	\$225.58	\$184.48	\$143.38
0810004	Gloucester	Mantua Township MUA	\$0.00	\$75.10					\$300.40	\$225.30	\$150.20	\$75.10
2121001	Warren	New Jersey American Water Company - Washington	\$40.80	\$93.00	\$27.24	\$35.28			\$597.71	\$497.90	\$398.09	\$298.29
0417001	Camden	New Jersey American Water (Haddonfield)	\$12.50	\$94.22					\$426.88	\$332.66	\$238.44	\$144.22
0231001	Bergen	Lodi Water Department	\$24.00	\$48.00					\$288.00	\$240.00	\$192.00	\$144.00
0248001	Bergen	Borough of Ramsey Board of Public Works	\$0.00	\$85.65					\$342.60	\$256.95	\$171.30	\$85.65
0904001	Hudson	Harrison Town Water Department	\$0.00	\$190.09					\$760.37	\$570.28	\$380.19	\$190.09
1435002	Morris	Rockaway Township Water Dept	\$0.00	\$99.07					\$396.30	\$297.22	\$198.15	\$99.07
1439001	Morris	Wharton Water Department	\$0.00	\$69.98					\$279.93	\$209.95	\$139.96	\$69.98
1403001	Morris	Butler Water Department	\$41.75	\$109.85					\$606.40	\$496.55	\$386.70	\$276.85
1207001	Middlesex	Highland Park Borough Water and Sewer Department	\$45.00	\$133.03					\$712.11	\$579.09	\$446.06	\$313.03
0824001	Gloucester	Aqua New Jersey - Woolwich System	\$54.72	\$87.07					\$567.16	\$480.09	\$393.02	\$305.95

Assessing the Affordability of Water and Sewer Utility Costs in New Jersey

PWSID #	County	Name	Base Charge (quarterly, smallest residential meter size)	Volume Charge (15K gallons per quarter)	Purchased Water Adjustment Clause Charge (Annual)	Distribution System Improvement Charge (DSIC) (Annual)	Energy & Treatment Recovery Clause	Additional Charges	Total Cost (60K gallons per year)	Total Cost (45K gallons per year)	Total Cost (30K gallons per year)	Total Cost (15K gallons per year)
0822001	Gloucester	Woodbury City Water Department	\$0.00	\$78.65					\$314.60	\$235.95	\$157.30	\$78.65
1707001	Salem	New Jersey American Water Company - Pennsgrove	\$40.80	\$67.48	\$27.24	\$35.28			\$495.65	\$421.36	\$347.06	\$272.77
1616001	Passaic	Woodland Park Water Department										
		inside city	\$0.00	\$110.07					\$440.28	\$330.21	\$220.14	\$110.07
		outside city	\$0.00	\$220.05					\$880.20	\$660.15	\$440.10	\$220.05
0305001	Burlington	Burlington City Water Department	\$70.13	\$140.25				\$841.50	\$701.25	\$561.00	\$420.75	
0428002	Camden	Pine Hill Borough MUA	\$17.50	\$46.50				\$256.00	\$209.50	\$163.00	\$116.50	
1505002	Ocean	Aqua New Jersey Eastern Division	\$42.99	\$87.07				\$520.24	\$433.17	\$346.10	\$259.03	
0329004	Burlington	Pemberton Township	\$0	\$70.50				\$282.00	\$214.50	\$156.00	\$156.00	
0104003	Atlantic	Buena Borough MUA	\$0.00	\$63.50				\$254.00	\$190.50	\$127.00	\$63.50	
1350001	Monmouth	New Jersey American Water Company - Union Beach	\$40.80	\$93.00	\$27.24	\$35.28			\$597.71	\$497.90	\$398.09	\$298.29
0107001	Atlantic	Egg Harbor City	\$60.00	\$75.00					\$540.00	\$465.00	\$390.00	\$315.00
0318002	Burlington	New Jersey American Water Company - Homestead	\$40.80	\$93.00	\$27.24	\$35.28			\$597.71	\$497.90	\$398.09	\$298.29
1906002	Sussex	Franklin Public Water	\$0.00	\$97.50					\$390.00	\$292.50	\$195.00	\$97.50
1523003	Ocean	New Jersey American Water Company - New Egypt	\$40.80	\$93.00	\$27.24	\$35.28			\$597.71	\$497.90	\$398.09	\$298.29
1911001	Sussex	Aqua New Jersey - Walkill	\$42.99	\$51.15					\$376.57	\$325.41	\$274.26	\$223.11
1004001	Hunterdon	Aqua New Jersey - Califon	\$42.99	\$87.07					\$520.24	\$433.17	\$346.10	\$259.03
1011001	Hunterdon	New Jersey American Water Company - Frenchtown	\$40.80	\$93.00	\$27.24	\$35.28			\$597.71	\$497.90	\$398.09	\$298.29
1907002	Sussex	Aqua New Jersey - Bear Brook	\$42.99	\$87.07					\$520.24	\$433.17	\$346.10	\$259.03
1015003	Hunterdon	Aqua New Jersey - Riegel Ridge	\$42.99	\$87.07					\$520.24	\$433.17	\$346.10	\$259.03
1922008	Sussex	Aqua New Jersey - Vernon	\$42.99	\$87.07					\$520.24	\$433.17	\$346.10	\$259.03
0333004	Burlington	New Jersey American Water Company - Vincentown	\$39.80	\$93.00	\$27.24	\$35.28			\$593.71	\$493.90	\$394.09	\$294.29
1427009	Morris	New Jersey American Water Company - West Jersey	\$40.80	\$93.00	\$27.24	\$35.28			\$597.71	\$497.90	\$398.09	\$298.29
1019001	Hunterdon	Aqua New Jersey - Bunnvale	\$42.99	\$87.07					\$520.24	\$433.17	\$346.10	\$259.03

Assessing the Affordability of Water and Sewer Utility Costs in New Jersey

PWSID #	County	Name	Base Charge (quarterly, smallest residential meter size)	Volume Charge (15K gallons per quarter)	Purchased Water Adjustment Clause Charge (Annual)	Distribution System Improvement Charge (DSIC) (Annual)	Energy & Treatment Recovery Clause	Additional Charges	Total Cost (60K gallons per year)	Total Cost (45K gallons per year)	Total Cost (30K gallons per year)	Total Cost (15K gallons per year)
1908001	Sussex	Aqua - Tranquility Springs	\$54.72	\$87.07					\$567.16	\$480.09	\$393.02	\$305.95
2120002	Warren	Aqua New Jersey - Warren Glen	\$54.72	\$87.07					\$567.16	\$480.09	\$393.02	\$305.95
1438001	Morris	Aqua - Cliffside Park	\$135.00	\$0.00					\$540.00	\$540.00	\$540.00	\$540.00
1015004	Hunterdon	Aqua New Jersey - Fox Hill	\$54.72	\$87.07					\$567.16	\$480.09	\$393.02	\$305.95
0326001	Burlington	Aqua New Jersey - California Village 1	\$54.72	\$87.07					\$567.16	\$480.09	\$393.02	\$305.95

Assessing the Affordability of Water and Sewer Utility Costs in New Jersey

**Table 16. Sewer Water Utility Rates and Estimated Household Costs**

NJPDES Permit Number	Facility Name	Municipality	Base Charge (quarterly, single family residential)	Volume Charge (15K gallons per quarter)	Total Annual Cost (60K)	Total Annual Cost (45K)	Total Annual Cost (30K)	Total Annual Cost (15K)
NJ0024473	ATLANTIC COUNTY UTILITIES AUTH WWTF	Absecon City		\$84.86	\$339.43	\$254.57	\$169.72	\$84.86
NJ0024473	ATLANTIC COUNTY UTILITIES AUTH WWTF	Atlantic City		\$126.86	\$507.43	\$380.57	\$253.72	\$126.86
NJ0024473	ATLANTIC COUNTY UTILITIES AUTH WWTF	Brigantine City		\$79.29	\$317.14	\$237.86	\$158.57	\$79.29
NJ0024473	ATLANTIC COUNTY UTILITIES AUTH WWTF	Egg Harbor City		\$138.22	\$552.88	\$414.66	\$276.44	\$138.22
NJ0024473	ATLANTIC COUNTY UTILITIES AUTH WWTF	Egg Harbor Township		\$71.14	\$284.57	\$213.43	\$142.29	\$71.14
NJ0024473	ATLANTIC COUNTY UTILITIES AUTH WWTF	Galloway Township		\$82.50	\$330.00	\$247.50	\$165.00	\$82.50
NJ0024473	ATLANTIC COUNTY UTILITIES AUTH WWTF	Hamilton Township		\$64.93	\$259.71	\$194.78	\$129.86	\$64.93
NJ0024473	ATLANTIC COUNTY UTILITIES AUTH WWTF	Linwood City		\$64.29	\$257.14	\$192.86	\$128.57	\$64.29
NJ0024473	ATLANTIC COUNTY UTILITIES AUTH WWTF	Longport Borough		\$66.43	\$265.71	\$199.28	\$132.86	\$66.43
NJ0024473	ATLANTIC COUNTY UTILITIES AUTH WWTF	Margate City		\$80.36	\$321.43	\$241.07	\$160.72	\$80.36
NJ0024473	ATLANTIC COUNTY UTILITIES AUTH WWTF	Northfield		\$77.14	\$308.57	\$231.43	\$154.29	\$77.14
NJ0024473	ATLANTIC COUNTY UTILITIES AUTH WWTF	Pleasantville		\$107.14	\$428.57	\$321.43	\$214.29	\$107.14
NJ0024473	ATLANTIC COUNTY UTILITIES AUTH WWTF	Somers Point		\$79.29	\$317.14	\$237.86	\$158.57	\$79.29
NJ0024473	ATLANTIC COUNTY UTILITIES AUTH WWTF	Ventnor City		\$118.01	\$472.03	\$354.02	\$236.02	\$118.01
NJ0020028	BERGEN CNTY UTILITIES AUTHORITY (BCUA)	Bergenfield Borough			AVT	AVT	AVT	AVT
NJ0020028	BERGEN CNTY UTILITIES AUTHORITY (BCUA)	Bogota Borough			AVT	AVT	AVT	AVT
NJ0020028	BERGEN CNTY UTILITIES AUTHORITY (BCUA)	Carlstadt Borough			AVT	AVT	AVT	AVT
NJ0020028	BERGEN CNTY UTILITIES AUTHORITY (BCUA)	Cliffside Park Borough			AVT	AVT	AVT	AVT
NJ0020028	BERGEN CNTY UTILITIES AUTHORITY (BCUA)	Closter Borough			AVT	AVT	AVT	AVT
NJ0020028	BERGEN CNTY UTILITIES AUTHORITY (BCUA)	Cresskill Borough			AVT	AVT	AVT	AVT
NJ0020028	BERGEN CNTY UTILITIES AUTHORITY (BCUA)	Dumont Borough			AVT	AVT	AVT	AVT
NJ0020028	BERGEN CNTY UTILITIES AUTHORITY (BCUA)	East Rutherford Borough	\$8.75		\$35.00	\$35.00	\$35.00	\$35.00
NJ0020028	BERGEN CNTY UTILITIES AUTHORITY (BCUA)	Emerson Borough			AVT	AVT	AVT	AVT
NJ0020028	BERGEN CNTY UTILITIES AUTHORITY (BCUA)	Englewood			AVT	AVT	AVT	AVT
NJ0020028	BERGEN CNTY UTILITIES AUTHORITY (BCUA)	Englewood Cliffs Borough			AVT	AVT	AVT	AVT
NJ0020028	BERGEN CNTY UTILITIES AUTHORITY (BCUA)	Fairview Borough	\$120.00		\$480.00	\$480.00	\$480.00	\$480.00
NJ0020028	BERGEN CNTY UTILITIES AUTHORITY (BCUA)	Fort Lee Borough			AVT	AVT	AVT	AVT
NJ0020028	BERGEN CNTY UTILITIES AUTHORITY (BCUA)	Hackensack			AVT	AVT	AVT	AVT
NJ0020028	BERGEN CNTY UTILITIES AUTHORITY (BCUA)	Harrington Park Borough			NA	NA	NA	NA

Assessing the Affordability of Water and Sewer Utility Costs in New Jersey

NJPDES Permit Number	Facility Name	Municipality	Base Charge (quarterly, single family residential)	Volume Charge (15K gallons per quarter)	Total Annual Cost (60K)	Total Annual Cost (45K)	Total Annual Cost (30K)	Total Annual Cost (15K)
NJ0020028	BERGEN CNTY UTILITIES AUTHORITY (BCUA)	Hasbrouck Heights Borough			AVT	AVT	AVT	AVT
NJ0020028	BERGEN CNTY UTILITIES AUTHORITY (BCUA)	Haworth Borough			NA	NA	NA	NA
NJ0020028	BERGEN CNTY UTILITIES AUTHORITY (BCUA)	Hillsdale Borough			AVT	AVT	AVT	AVT
NJ0020028	BERGEN CNTY UTILITIES AUTHORITY (BCUA)	Leonia Borough			NA	NA	NA	NA
NJ0020028	BERGEN CNTY UTILITIES AUTHORITY (BCUA)	Little Ferry Borough			AVT	AVT	AVT	AVT
NJ0020028	BERGEN CNTY UTILITIES AUTHORITY (BCUA)	Lyndhurst Township			AVT	AVT	AVT	AVT
NJ0020028	BERGEN CNTY UTILITIES AUTHORITY (BCUA)	Maywood Borough			AVT	AVT	AVT	AVT
NJ0020028	BERGEN CNTY UTILITIES AUTHORITY (BCUA)	Montvale Borough			AVT	AVT	AVT	AVT
NJ0020028	BERGEN CNTY UTILITIES AUTHORITY (BCUA)	New Milford Borough			AVT	AVT	AVT	AVT
NJ0020028	BERGEN CNTY UTILITIES AUTHORITY (BCUA)	Northvale Borough			AVT	AVT	AVT	AVT
NJ0020028	BERGEN CNTY UTILITIES AUTHORITY (BCUA)	Old Tappan Borough	\$162.50		\$650.00	\$650.00	\$650.00	\$650.00
NJ0020028	BERGEN CNTY UTILITIES AUTHORITY (BCUA)	Oradell Borough			AVT	AVT	AVT	AVT
NJ0020028	BERGEN CNTY UTILITIES AUTHORITY (BCUA)	Paramus Borough	\$55.00		\$220.00	\$220.00	\$220.00	\$220.00
NJ0020028	BERGEN CNTY UTILITIES AUTHORITY (BCUA)	Park Ridge Borough			AVT	AVT	AVT	AVT
NJ0020028	BERGEN CNTY UTILITIES AUTHORITY (BCUA)	Ridgefield Park Village			AVT	AVT	AVT	AVT
NJ0020028	BERGEN CNTY UTILITIES AUTHORITY (BCUA)	Teaneck Borough			AVT	AVT	AVT	AVT
NJ0020028	BERGEN CNTY UTILITIES AUTHORITY (BCUA)	Washington Township			AVT	AVT	AVT	AVT
NJ0020028	BERGEN CNTY UTILITIES AUTHORITY (BCUA)	Wood-Ridge Borough-WR portion			AVT	AVT	AVT	AVT
NJ0020028	BERGEN CNTY UTILITIES AUTHORITY (BCUA)	Wood-Ridge Borough-Edgewater portion	\$40.00		\$160.00	\$160.00	\$160.00	\$160.00
NJ0020028	BERGEN COUNTY UTILITIES AUTHORITY	Edgewater Boro			AVT	AVT	AVT	AVT
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Audubon Borough	\$118.00		\$472.00	\$472.00	\$472.00	\$472.00
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Audubon Park Borough	\$88.00		\$352.00	\$352.00	\$352.00	\$352.00
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Barrington Borough	\$146.00		\$584.00	\$584.00	\$584.00	\$584.00
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Bellmawr Borough	\$103.50		\$414.00	\$414.00	\$414.00	\$414.00
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Berlin Borough	\$150.00		\$600.00	\$600.00	\$600.00	\$600.00
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Berlin Township	\$183.00		\$732.00	\$732.00	\$732.00	\$732.00
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Brooklawn Borough	\$145.00		\$580.00	\$580.00	\$580.00	\$580.00

Assessing the Affordability of Water and Sewer Utility Costs in New Jersey

NJPDES Permit Number	Facility Name	Municipality	Base Charge (quarterly, single family residential)	Volume Charge (15K gallons per quarter)	Total Annual Cost (60K)	Total Annual Cost (45K)	Total Annual Cost (30K)	Total Annual Cost (15K)
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Camden City <sup>41</sup>	\$105.80	\$44.11	\$599.66	\$555.54	\$511.43	\$467.31
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Cherry Hill Township	\$111.75		\$447.00	\$447.00	\$447.00	\$447.00
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Chesilhurst Borough	\$188.00		\$752.00	\$752.00	\$752.00	\$752.00
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Clementon Borough	\$143.00		\$572.00	\$572.00	\$572.00	\$572.00
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Collingswood Borough	\$151.75		\$607.00	\$607.00	\$607.00	\$607.00
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Gibbsboro Borough	\$135.50		\$542.00	\$542.00	\$542.00	\$542.00
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Gloucester City	\$168.40		\$673.60	\$673.60	\$673.60	\$673.60
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Gloucester Township	\$88.00		\$352.00	\$352.00	\$352.00	\$352.00
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Haddon Heights Borough	\$95.50		\$382.00	\$382.00	\$382.00	\$382.00
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Haddon Township	\$131.75		\$527.00	\$527.00	\$527.00	\$527.00
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Haddonfield Borough	\$88.00	\$45.25	\$533.00	\$482.15	\$432.70	\$392.35
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Hi-Nella Borough	\$88.00		\$352.00	\$352.00	\$352.00	\$352.00
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Laurel Springs Borough	\$131.75		\$527.00	\$527.00	\$527.00	\$527.00
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Lindenwold Borough	\$121.75		\$487.00	\$487.00	\$487.00	\$487.00
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Magnolia Borough	\$188.00		\$752.00	\$752.00	\$752.00	\$752.00
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Merchantville Borough	\$148.00		\$592.00	\$592.00	\$592.00	\$592.00
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Mount Ephraim Borough	\$88.00		\$352.00	\$352.00	\$352.00	\$352.00
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Oaklyn Borough	\$88.00		\$352.00	\$352.00	\$352.00	\$352.00
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Pennsauken Township	\$139.50		\$558.00	\$558.00	\$558.00	\$558.00
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Pine Hill Borough	\$138.00		\$552.00	\$552.00	\$552.00	\$552.00
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Runnemede Borough	\$129.00		\$516.00	\$516.00	\$516.00	\$516.00
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Somerdale Borough	\$98.00		\$392.00	\$392.00	\$392.00	\$392.00
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Stratford Borough	\$113.00		\$452.00	\$452.00	\$452.00	\$452.00
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Tavistock Borough	\$88.00		\$352.00	\$352.00	\$352.00	\$352.00
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Voorhees Township	\$128.00		\$512.00	\$512.00	\$512.00	\$512.00
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Waterford Township	\$130.50		\$522.00	\$522.00	\$522.00	\$522.00
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Winslow Township	\$188.00		\$752.00	\$752.00	\$752.00	\$752.00
NJ0026182	CAMDEN COUNTY MUA-DELAWARE #1 WPCF	Woodlynne Borough	\$88.00		\$352.00	\$352.00	\$352.00	\$352.00

<sup>41</sup> The municipal portion of sewer costs is addressed through water rates – Camden County MUA charges customers directly for its costs.

Assessing the Affordability of Water and Sewer Utility Costs in New Jersey

NJPDES Permit Number	Facility Name	Municipality	Base Charge (quarterly, single family residential)	Volume Charge (15K gallons per quarter)	Total Annual Cost (60K)	Total Annual Cost (45K)	Total Annual Cost (30K)	Total Annual Cost (15K)
NJ0024759	EWING-LAWRENCE SA WTP	Hopewell Township	\$80.58	\$9.20	\$359.12	\$331.52	\$322.32	\$322.32
NJ0024686	GLOUCESTER CNTY UTIL AUTH	Clayton Borough	\$108.00		\$432.00	\$432.00	\$432.00	\$432.00
NJ0024686	GLOUCESTER CNTY UTIL AUTH	Deptford Township	\$102.00		\$408.00	\$408.00	\$408.00	\$408.00
NJ0024686	GLOUCESTER CNTY UTIL AUTH	East Greenwich Township	\$75.00	\$46.50	\$486.00	\$439.50	\$393.00	\$346.50
NJ0024686	GLOUCESTER CNTY UTIL AUTH	Glassboro Borough	\$115.00		\$460.00	\$460.00	\$460.00	\$460.00
NJ0024686	GLOUCESTER CNTY UTIL AUTH	Mantua Township	\$92.00		\$368.00	\$368.00	\$368.00	\$368.00
NJ0024686	GLOUCESTER CNTY UTIL AUTH	Monroe Township	\$117.57		\$470.28	\$470.28	\$470.28	\$470.28
NJ0024686	GLOUCESTER CNTY UTIL AUTH	National Park Borough	\$100.00		\$400.00	\$400.00	\$400.00	\$400.00
NJ0024686	GLOUCESTER CNTY UTIL AUTH	Paulsboro Borough	\$83.50		\$334.00	\$334.00	\$334.00	\$334.00
NJ0024686	GLOUCESTER CNTY UTIL AUTH	Pitman Borough	\$56.00	\$45.99	\$407.96	\$256.85	\$224.00	\$224.00
NJ0024686	GLOUCESTER CNTY UTIL AUTH	Washington Township	\$68.50	\$27.75	\$385.00	\$357.25	\$329.50	\$301.75
NJ0024686	GLOUCESTER CNTY UTIL AUTH	Wenonah Borough	\$110.00		\$440.00	\$440.00	\$440.00	\$440.00
NJ0024686	GLOUCESTER CNTY UTIL AUTH	West Deptford Township	\$145.00		\$80.40	\$80.40	\$80.40	\$80.40
NJ0024686	GLOUCESTER CNTY UTIL AUTH	Westville Borough	\$120.00		\$480.00	\$480.00	\$480.00	\$480.00
NJ0024686	GLOUCESTER CNTY UTIL AUTH	Woodbury	\$139.50		\$558.00	\$558.00	\$558.00	\$558.00
NJ0024686	GLOUCESTER CNTY UTIL AUTH	Woodbury Heights Borough	\$160.00		\$640.00	\$640.00	\$640.00	\$640.00
NJ0026301	HAMILTON TWP WPCF	Hamilton Township	\$76.50		\$306.00	\$306.00	\$306.00	\$306.00
NJ0026301	HAMILTON TWP WPCF	Robbinsville Township	\$85.00		\$340.00	\$340.00	\$340.00	\$340.00
NJ0024741	JOINT MEETING OF ESSEX/UNION COUNTIES	City of Orange Township	\$37.74		\$150.96	\$150.96	\$150.96	\$150.96
NJ0024741	JOINT MEETING OF ESSEX/UNION COUNTIES	East Orange	\$76.70		\$306.80	\$306.80	\$306.80	\$306.80
NJ0024741	JOINT MEETING OF ESSEX/UNION COUNTIES	Elizabeth City	\$3.82	\$69.44	\$293.04	\$223.60	\$154.16	\$84.72
NJ0024741	JOINT MEETING OF ESSEX/UNION COUNTIES	Hillside Township		\$58.50	\$234.00	\$175.50	\$117.00	\$58.50
NJ0024741	JOINT MEETING OF ESSEX/UNION COUNTIES	Irvington Township		\$58.50	\$234.00	\$175.50	\$117.00	\$58.50
NJ0024741	JOINT MEETING OF ESSEX/UNION COUNTIES	Maplewood Township	\$46.00		\$184.00	\$184.00	\$184.00	\$184.00
NJ0024741	JOINT MEETING OF ESSEX/UNION COUNTIES	Millburn Township		\$58.50	\$234.00	\$175.50	\$117.00	\$58.50
NJ0024741	JOINT MEETING OF ESSEX/UNION COUNTIES	Newark City	\$150.48		\$601.92	\$601.92	\$601.92	\$601.92
NJ0024741	JOINT MEETING OF ESSEX/UNION COUNTIES	Roselle Park Borough		\$58.50	\$234.00	\$175.50	\$117.00	\$58.50
NJ0024741	JOINT MEETING OF ESSEX/UNION COUNTIES	South Orange Village Twp	\$65.00		\$260.00	\$260.00	\$260.00	\$260.00
NJ0024741	JOINT MEETING OF ESSEX/UNION COUNTIES	Summit City		\$58.50	\$234.00	\$175.50	\$117.00	\$58.50
NJ0024741	JOINT MEETING OF ESSEX/UNION COUNTIES	Union Township		\$58.50	\$234.00	\$175.50	\$117.00	\$58.50

Assessing the Affordability of Water and Sewer Utility Costs in New Jersey

NJPDES Permit Number	Facility Name	Municipality	Base Charge (quarterly, single family residential)	Volume Charge (15K gallons per quarter)	Total Annual Cost (60K)	Total Annual Cost (45K)	Total Annual Cost (30K)	Total Annual Cost (15K)
NJ0024741	JOINT MEETING OF ESSEX/UNION COUNTIES	West Orange Township	\$87.50		\$350.00	\$350.00	\$350.00	\$350.00
NJ0024953	LINDEN ROSELLE SA	Linden City		\$70.78	\$283.14	\$212.35	\$141.57	\$70.78
NJ0024953	LINDEN ROSELLE SA	Roselle Borough		\$70.78	\$283.14	\$212.35	\$141.57	\$70.78
NJ0020141	MIDDLESEX CNTY UA	Bound Brook Borough	\$13.88	\$81.00	\$379.50	\$298.50	\$217.50	\$136.50
NJ0020141	MIDDLESEX CNTY UA	Carteret Borough	\$84.50	\$7.06	\$366.22	\$340.75	\$338.00	\$338.00
NJ0020141	MIDDLESEX CNTY UA	Cranbury Township	\$77.17	\$111.45	\$754.48	\$643.03	\$531.58	\$420.13
NJ0020141	MIDDLESEX CNTY UA	Dunellen Borough	\$87.00		\$348.00	\$348.00	\$348.00	\$348.00
NJ0020141	MIDDLESEX CNTY UA	East Brunswick Township			\$188.75	\$0.00	\$0.00	\$0.00
NJ0020141	MIDDLESEX CNTY UA	Edison Township		\$50.42	\$201.68	\$151.26	\$100.84	\$50.42
NJ0020141	MIDDLESEX CNTY UA	Fanwood Borough	\$50.00		\$200.00	\$200.00	\$200.00	\$200.00
NJ0020141	MIDDLESEX CNTY UA	Franklin Township	\$75.75		\$303.00	\$303.00	\$303.00	\$303.00
NJ0020141	MIDDLESEX CNTY UA	Green Brook Township	\$137.50		\$550.00	\$550.00	\$550.00	\$550.00
NJ0020141	MIDDLESEX CNTY UA	Helmetta Borough	\$76.25	\$55.50	\$527.00	\$471.50	\$416.00	\$360.50
NJ0020141	MIDDLESEX CNTY UA	Highland Park Borough		\$55.87	\$223.46	\$167.60	\$111.73	71.64
NJ0020141	MIDDLESEX CNTY UA	Jamesburg Borough	\$77.00		\$308.00	\$308.00	\$308.00	\$308.00
NJ0020141	MIDDLESEX CNTY UA	Middlesex Borough			AVT	AVT	AVT	AVT
NJ0020141	MIDDLESEX CNTY UA	Milltown Borough	\$51.65	\$43.05	\$378.80	\$335.75	\$292.70	\$249.65
NJ0020141	MIDDLESEX CNTY UA	Monroe Township	\$64.75	\$16.85	\$326.40	\$259.00	\$259.00	\$259.00
NJ0020141	MIDDLESEX CNTY UA	New Brunswick City	\$60.41		\$241.64	\$241.64	\$241.64	\$241.64
NJ0020141	MIDDLESEX CNTY UA	North Brunswick Township	\$0.00	\$94.07	\$376.28	\$269.81	\$171.34	\$85.67
NJ0020141	MIDDLESEX CNTY UA	North Plainfield Borough	\$97.69		\$390.76	\$390.76	\$390.76	\$390.76
NJ0020141	MIDDLESEX CNTY UA	Old Bridge Township	\$142.77		\$571.08	\$571.08	\$571.08	\$571.08
NJ0020141	MIDDLESEX CNTY UA	Perth Amboy City	\$22.29	\$66.98	\$357.09	\$267.86	\$178.63	\$89.40
NJ0020141	MIDDLESEX CNTY UA	South Amboy City	\$27.89	\$66.98	\$379.49	\$312.51	\$245.53	\$178.54
NJ0020141	MIDDLESEX CNTY UA	South Brunswick Township	\$80.97	\$33.70	\$458.68	\$357.58	\$323.88	\$323.88
NJ0020141	MIDDLESEX CNTY UA	Spotswood Borough	\$76.25	\$55.50	\$527.00	\$471.50	\$416.00	\$360.50
NJ0025356	MIDDLETOWN SA (TOMSA)	Atlantic Highlands Borough	\$174.90		\$699.60	\$620.40	\$620.40	\$440.00
NJ0025356	MIDDLETOWN SA (TOMSA)	Highlands Borough	\$140.00		\$560.00	\$560.00	\$560.00	\$560.00
NJ0025356	MIDDLETOWN SA (TOMSA)	Middletown Twp	\$75.00		\$300.00	\$300.00	\$300.00	\$300.00
NJ0026085	NORTH HUDSON SA-ADAMS STREET WTP	Hoboken City	\$57.36	\$84.42	\$567.12	\$426.42	\$285.72	\$229.44

Assessing the Affordability of Water and Sewer Utility Costs in New Jersey

NJPDES Permit Number	Facility Name	Municipality	Base Charge (quarterly, single family residential)	Volume Charge (15K gallons per quarter)	Total Annual Cost (60K)	Total Annual Cost (45K)	Total Annual Cost (30K)	Total Annual Cost (15K)
NJ0026085	NORTH HUDSON SA-ADAMS STREET WTP	Union City	\$57.36	\$84.42	\$567.12	\$426.42	\$285.72	\$229.44
NJ0026085	NORTH HUDSON SA-ADAMS STREET WTP	Weehawken Township	\$57.36	\$84.42	\$567.12	\$426.42	\$285.72	\$229.44
NJ0025321	NORTH HUDSON SEWERAGE AUTHORITY	West New York Township	\$57.36	\$84.42	\$567.12	\$426.42	\$285.72	\$229.44
NJ0024813	NORTHWEST BERGEN CNTY UA	Allendale Borough			AVT	AVT	AVT	AVT
NJ0024813	NORTHWEST BERGEN CNTY UA	Franklin Lakes Borough	\$115.50		\$462.00	\$462.00	\$462.00	\$462.00
NJ0024813	NORTHWEST BERGEN CNTY UA	Ho-Ho-Kus Borough			AVT	AVT	AVT	AVT
NJ0024813	NORTHWEST BERGEN CNTY UA	Mahwah Township	\$88.00	\$47.55	\$542.21	\$369.52	\$352.13	\$352.00
NJ0024813	NORTHWEST BERGEN CNTY UA	Midland Park Borough			AVT	AVT	AVT	AVT
NJ0024813	NORTHWEST BERGEN CNTY UA	Ramsey Borough	\$113.63	\$22.50	\$544.52	\$454.52	\$454.52	\$454.52
NJ0024813	NORTHWEST BERGEN CNTY UA	Waldwick Borough			AVT	AVT	AVT	AVT
NJ0024813	NORTHWEST BERGEN CNTY UA	Wyckoff Township	\$117.50		\$470.00	\$470.00	\$470.00	\$470.00
NJ0029408	OCEAN COUNTY UA-Central WPCF	Berkeley Twp	\$86.00		\$344.00	\$344.00	\$344.00	\$344.00
NJ0029408	OCEAN COUNTY UA-Central WPCF	Barneгат Township	\$104.00		\$416.00	\$416.00	\$416.00	\$416.00
NJ0029408	OCEAN COUNTY UA-Central WPCF	Beachwood Borough	\$106.00		\$424.00	\$424.00	\$424.00	\$424.00
NJ0029408	OCEAN COUNTY UA-Central WPCF	Berkeley Township	\$86.00		\$344.00	\$344.00	\$344.00	\$344.00
NJ0029408	OCEAN COUNTY UA-Central WPCF	Island Heights Borough	\$105.00	\$28.00	\$532.00	\$479.50	\$427.00	\$420.00
NJ0029408	OCEAN COUNTY UA-Central WPCF	Lacey Township	\$86.50	\$17.40	\$415.60	\$398.20	\$380.80	\$363.40
NJ0029408	OCEAN COUNTY UA-Central WPCF	Lakehurst Borough	\$104.33	\$16.86	\$484.76	\$417.32	\$417.32	\$417.32
NJ0029408	OCEAN COUNTY UA-Central WPCF	Lavallette Borough	\$69.00	\$42.50	\$446.00	\$382.25	\$318.50	\$276.00
NJ0029408	OCEAN COUNTY UA-Central WPCF	Manchester Township-East	\$82.00		\$328.00	\$328.00	\$328.00	\$328.00
NJ0029408	OCEAN COUNTY UA-Central WPCF	Manchester Township-West	\$51.08		\$204.32	\$204.32	\$204.32	\$204.32
NJ0029408	OCEAN COUNTY UA-Central WPCF	Mantoloking Borough	\$52.49		\$209.94	\$209.94	\$209.94	\$209.94
NJ0029408	OCEAN COUNTY UA-Central WPCF	Ocean Gate Borough	\$100.00		\$400.00	\$400.00	\$400.00	\$400.00
NJ0029408	OCEAN COUNTY UA-Central WPCF	Ocean Township	\$42.80	\$60.00	\$411.20	\$351.20	\$291.20	\$231.20
NJ0029408	OCEAN COUNTY UA-Central WPCF	Pine Beach Borough	\$100.00		\$400.00	\$400.00	\$400.00	\$400.00
NJ0029408	OCEAN COUNTY UA-Central WPCF	Seaside Heights Borough		\$180.00	\$720.00	\$540.00	\$360.00	\$180.00
NJ0029408	OCEAN COUNTY UA-Central WPCF	Seaside Park Borough	\$140.00		\$560.00	\$560.00	\$560.00	\$560.00
NJ0029408	OCEAN COUNTY UA-Central WPCF	South Toms River Borough	\$100.00		\$400.00	\$400.00	\$400.00	\$400.00
NJ0029408	OCEAN COUNTY UA-Central WPCF	Toms River Township	\$66.50		\$266.00	\$266.00	\$266.00	\$266.00
NJ0028142	OCEAN COUNTY UA- Northern WPCF	Bay Head Borough	\$99.75		\$399.00	\$399.00	\$399.00	\$399.00

Assessing the Affordability of Water and Sewer Utility Costs in New Jersey

NJPDES Permit Number	Facility Name	Municipality	Base Charge (quarterly, single family residential)	Volume Charge (15K gallons per quarter)	Total Annual Cost (60K)	Total Annual Cost (45K)	Total Annual Cost (30K)	Total Annual Cost (15K)
NJ0028142	OCEAN COUNTY UA- Northern WPCF	Brick Township	\$60.50	\$63.15	\$494.60	\$431.45	\$368.30	\$305.15
NJ0028142	OCEAN COUNTY UA- Northern WPCF	Freehold Borough	\$44.69	\$68.83	\$454.09	\$339.37	\$224.65	\$178.76
NJ0028142	OCEAN COUNTY UA- Northern WPCF	Freehold Township	\$121.69	\$10.10	\$527.16	\$496.86	\$486.76	\$486.76
NJ0028142	OCEAN COUNTY UA- Northern WPCF	Howell Township	\$124.00		\$496.00	\$496.00	\$496.00	\$496.00
NJ0028142	OCEAN COUNTY UA- Northern WPCF	Jackson Township	\$27.00	\$75.00	\$408.00	\$333.00	\$258.00	\$183.00
NJ0028142	OCEAN COUNTY UA- Northern WPCF	Lakewood Township	\$80.55		\$322.20	\$322.20	\$322.20	\$322.20
NJ0028142	OCEAN COUNTY UA- Northern WPCF	Point Pleasant Beach Boro	\$60.60	\$32.19	\$371.16	\$338.97	\$306.78	\$274.59
NJ0028142	OCEAN COUNTY UA- Northern WPCF	Point Pleasant Borough <sup>42</sup>	\$67.00	\$117.75	\$739.00	\$621.25	\$503.50	\$385.75
NJ0028142	OCEAN COUNTY UA- Northern WPCF	Wall Township	\$105.72	\$17.28	\$492.00	\$434.40	\$463.20	\$422.88
NJ0026018	OCEAN COUNTY UA-Southern WPCF	Barnegat Light Borough	\$88.75		\$355.00	\$355.00	\$355.00	\$355.00
NJ0026018	OCEAN COUNTY UA-Southern WPCF	Beach Haven Borough	\$112.00	\$60.00	\$688.00	\$628.00	\$568.00	\$508.00
NJ0026018	OCEAN COUNTY UA-Southern WPCF	Harvey Cedars Borough	\$70.00	\$24.00	\$376.00	\$352.00	\$328.00	\$304.00
NJ0026018	OCEAN COUNTY UA-Southern WPCF	Little Egg Harbor Township	\$96.00		\$384.00	\$384.00	\$384.00	\$384.00
NJ0026018	OCEAN COUNTY UA-Southern WPCF	Long Beach Township	\$132.75		\$531.00	\$531.00	\$531.00	\$531.00
NJ0026018	OCEAN COUNTY UA-Southern WPCF	Ship Bottom Borough	\$100.00	\$15.80	\$463.20	\$447.40	\$431.60	\$415.80
NJ0026018	OCEAN COUNTY UA-Southern WPCF	Stafford Township	\$139.00	\$10.50	\$598.00	\$556.00	\$556.00	\$556.00
NJ0026018	OCEAN COUNTY UA-Southern WPCF	Surf City Borough	\$132.50		\$530.00	\$530.00	\$530.00	\$530.00
NJ0026018	OCEAN COUNTY UA-Southern WPCF	Tuckerton Borough	\$240.16		\$960.64	\$960.64	\$960.64	\$960.64
NJ0024970	PARSIPPANY TROY HILLS	Denville Township	\$106.00		\$424.00	\$424.00	\$424.00	\$424.00
NJ0024970	PARSIPPANY TROY HILLS	East Hanover Township	\$87.60		\$350.40	\$350.40	\$350.40	\$350.40
NJ0024970	PARSIPPANY TROY HILLS	Montville Township	\$90.25		\$361.00	\$361.00	\$361.00	\$361.00
NJ0024970	PARSIPPANY TROY HILLS	Mountain Lakes Borough	\$63.60		\$254.40	\$254.40	\$254.40	\$254.40
NJ0024970	PARSIPPANY TROY HILLS	Parsippany-Troy Hills	\$51.00	\$2.19	\$212.76	\$210.57	\$208.38	\$206.19
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	Bayonne		\$96.85	\$387.41	\$290.56	\$193.70	\$96.85
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	Belleville Township			AVT	AVT	AVT	AVT
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	Bloomfield Township			AVT	AVT	AVT	AVT
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	City of Orange Township		\$110.25	\$441.00	\$330.75	\$220.50	\$110.25
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	Clifton City	\$40.00	\$27.80	\$271.20	\$243.40	\$160.00	\$160.00

<sup>42</sup> This rate reflects a combined water and sewer bill from Point Pleasant Borough. No separation of rates exists.

Assessing the Affordability of Water and Sewer Utility Costs in New Jersey

NJPDES Permit Number	Facility Name	Municipality	Base Charge (quarterly, single family residential)	Volume Charge (15K gallons per quarter)	Total Annual Cost (60K)	Total Annual Cost (45K)	Total Annual Cost (30K)	Total Annual Cost (15K)
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	East Newark Borough		\$58.20	\$232.80	\$174.60	\$116.40	\$116.00
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	East Orange City	\$76.70	\$85.70	\$649.60	\$563.90	\$478.20	\$392.50
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	East Rutherford Borough	\$8.75		\$35.00	\$35.00	\$35.00	\$35.00
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	Elizabeth City	\$3.82	\$69.44	\$293.04	\$223.60	\$154.16	\$84.72
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	Fair Lawn Borough			AVT	AVT	AVT	AVT
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	Garfield City	\$50.00		\$200.00	\$200.00	\$200.00	\$200.00
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	Glen Ridge Borough			AVT	AVT	AVT	AVT
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	Glen Rock Borough			AVT	AVT	AVT	AVT
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	Guttenberg Town		\$146.10	\$584.40	\$438.30	\$292.20	\$146.10
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	Haledon Borough			AVT	AVT	AVT	AVT
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	Harrison Town	\$16.00		\$64.00	\$64.00	\$64.00	\$64.00
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	Hawthorne Borough			AVT	AVT	AVT	AVT
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	Jersey City		\$111.15	\$444.60	\$333.45	\$222.30	\$111.15
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	Kearny Town			AVT	AVT	AVT	AVT
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	Little Falls Township			AVT	AVT	AVT	AVT
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	Lodi Borough	\$40.00		\$160.00	\$160.00	\$160.00	\$160.00
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	Lyndhurst Township			AVT	AVT	AVT	AVT
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	Montclair Township	\$46.75	\$41.20	\$351.80	\$310.60	\$269.40	\$228.20
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	Newark City	\$165.48		\$661.92	\$661.92	\$661.92	\$661.92
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	North Arlington Borough			AVT	AVT	AVT	AVT
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	North Bergen Twp		\$111.00	\$444.00	\$333.00	\$222.00	\$111.00
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	North Haledon Borough			AVT	AVT	AVT	AVT
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	Nutley Township			AVT	AVT	AVT	AVT
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	Passaic City			AVT	AVT	AVT	AVT
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	Paterson City	\$56.00		\$224.00	\$224.00	\$224.00	\$224.00
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	Prospect Park Borough			AVT	AVT	AVT	AVT
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	Rutherford Borough			AVT	AVT	AVT	AVT
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	Saddle Brook Township			AVT	AVT	AVT	AVT
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	South Hackensack Township			AVT	AVT	AVT	AVT
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	Totowa Borough	\$23.32	\$42.88	\$264.80	\$221.92	\$179.04	\$136.16

Assessing the Affordability of Water and Sewer Utility Costs in New Jersey

NJPDES Permit Number	Facility Name	Municipality	Base Charge (quarterly, single family residential)	Volume Charge (15K gallons per quarter)	Total Annual Cost (60K)	Total Annual Cost (45K)	Total Annual Cost (30K)	Total Annual Cost (15K)
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	Union City	\$57.36	\$84.42	\$567.12	\$426.42	\$285.72	\$229.44
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	Wallington Borough			AVT	AVT	AVT	AVT
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	Wood-Ridge Borough			AVT	AVT	AVT	AVT
NJ0021016	PASSAIC VALLEY SEWERAGE COMM	Woodland Park Borough			AVT	AVT	AVT	AVT
NJ0024643	RAHWAY VALLEY SEWERAGE AUTH	Clark Township	\$70.00		\$280.00	\$280.00	\$280.00	\$280.00
NJ0024643	RAHWAY VALLEY SEWERAGE AUTH	Cranford Township	\$35.00		\$140.00	\$140.00	\$140.00	\$140.00
NJ0024643	RAHWAY VALLEY SEWERAGE AUTH	Fanwood Borough			AVT	AVT	AVT	AVT
NJ0024643	RAHWAY VALLEY SEWERAGE AUTH	Garwood Borough			AVT	AVT	AVT	AVT
NJ0024643	RAHWAY VALLEY SEWERAGE AUTH	Mountainside Borough	\$111.25		\$445.00	\$445.00	\$445.00	\$445.00
NJ0024643	RAHWAY VALLEY SEWERAGE AUTH	Rahway City	\$72.50		\$290.00	\$290.00	\$290.00	\$290.00
NJ0024643	RAHWAY VALLEY SEWERAGE AUTH	Roselle Park Borough		\$58.50	\$234.00	\$175.50	\$117.00	\$58.50
NJ0024643	RAHWAY VALLEY SEWERAGE AUTH	Scotch Plains Township			AVT	AVT	AVT	AVT
NJ0024643	RAHWAY VALLEY SEWERAGE AUTH	Springfield Township	\$62.50		\$250.00	\$250.00	\$250.00	\$250.00
NJ0024643	RAHWAY VALLEY SEWERAGE AUTH	Westfield Town	\$41.25		\$165.00	\$165.00	\$165.00	\$165.00
NJ0024643	RAHWAY VALLEY SEWERAGE AUTH	Woodbridge Township		\$108.15	\$432.60	\$324.45	\$216.30	\$108.15
NJ0022349	ROCKAWAY VALLEY REG SA	Boonton Town	\$78.30		\$313.20	\$313.20	\$313.20	\$313.20
NJ0022349	ROCKAWAY VALLEY REG SA	Boonton Township	\$102.00		\$408.00	\$408.00	\$408.00	\$408.00
NJ0022349	ROCKAWAY VALLEY REG SA	Denville Township	\$106.00		\$424.00	\$424.00	\$424.00	\$424.00
NJ0022349	ROCKAWAY VALLEY REG SA	Dover Town		\$64.36	\$257.44	\$193.08	\$128.72	\$64.36
NJ0022349	ROCKAWAY VALLEY REG SA	Mine Hill Township	\$210.00		\$840.00	\$840.00	\$840.00	\$840.00
NJ0022349	ROCKAWAY VALLEY REG SA	Randolph Township	\$88.00		\$352.00	\$352.00	\$352.00	\$352.00
NJ0022349	ROCKAWAY VALLEY REG SA	Rockaway Borough	\$50.00		\$200.00	\$200.00	\$200.00	\$200.00
NJ0022349	ROCKAWAY VALLEY REG SA	Rockaway Township	\$72.25		\$289.00	\$289.00	\$289.00	\$289.00
NJ0022349	ROCKAWAY VALLEY REG SA	Victory Gardens Borough	\$47.50		\$190.00	\$190.00	\$190.00	\$190.00
NJ0022349	ROCKAWAY VALLEY REG SA	Wharton Borough	\$76.00		\$304.00	\$304.00	\$304.00	\$304.00
NJ0024864	SOMERSET RARITAN VALLEY SA	Branchburg Township	\$49.88		\$199.50	\$199.50	\$199.50	\$199.50
NJ0024864	SOMERSET RARITAN VALLEY SA	Bridgewater Township	\$99.75		\$399.00	\$399.00	\$399.00	\$399.00
NJ0024864	SOMERSET RARITAN VALLEY SA	Green Brook Township	\$137.50		\$550.00	\$550.00	\$550.00	\$550.00
NJ0024864	SOMERSET RARITAN VALLEY SA	Hillsborough Township	\$105.00		\$420.00	\$420.00	\$420.00	\$420.00
NJ0024864	SOMERSET RARITAN VALLEY SA	Manville Borough	\$50.00	\$52.65	\$410.60	\$357.95	\$305.30	\$252.65

Assessing the Affordability of Water and Sewer Utility Costs in New Jersey

NJPDES Permit Number	Facility Name	Municipality	Base Charge (quarterly, single family residential)	Volume Charge (15K gallons per quarter)	Total Annual Cost (60K)	Total Annual Cost (45K)	Total Annual Cost (30K)	Total Annual Cost (15K)
NJ0024864	SOMERSET RARITAN VALLEY SA	Raritan Borough			AVT	AVT	AVT	AVT
NJ0024864	SOMERSET RARITAN VALLEY SA	Somerville Borough		\$125.33	\$501.30	\$375.98	\$250.65	\$125.33
NJ0024864	SOMERSET RARITAN VALLEY SA	Warren Township		\$141.78	\$567.12	\$425.34	\$283.56	\$141.78
NJ0031119	STONY BROOK RSA- RIVER ROAD STP	Princeton		\$132.02	\$528.06	\$396.05	\$264.03	\$132.02
NJ0031119	STONY BROOK RSA- RIVER ROAD STP	South Brunswick Township	\$132.83		\$531.32	\$531.32	\$531.32	\$531.32
NJ0031119	STONY BROOK RSA- RIVER ROAD STP	West Windsor Township		\$31.04	\$124.18	\$93.13	\$62.09	\$31.04
NJ0020923	TRENTON SEWER UTILITY	Trenton City		\$63.16	\$252.66	\$189.49	\$126.33	\$63.16
NJ0026735	TWO RIVERS WATER RECLAMATION AUTH	Eatontown Borough			AVT	AVT	AVT	AVT
NJ0026735	TWO RIVERS WATER RECLAMATION AUTH	Fair Haven Borough	\$90.00		\$360.00	\$360.00	\$360.00	\$360.00
NJ0026735	TWO RIVERS WATER RECLAMATION AUTH	Little Silver Borough	\$90.00		\$360.00	\$360.00	\$360.00	\$360.00
NJ0026735	TWO RIVERS WATER RECLAMATION AUTH	Monmouth Beach Borough	\$90.00		\$360.00	\$360.00	\$360.00	\$360.00
NJ0026735	TWO RIVERS WATER RECLAMATION AUTH	Oceanport Borough	\$90.00		\$360.00	\$360.00	\$360.00	\$360.00
NJ0026735	TWO RIVERS WATER RECLAMATION AUTH	Red Bank Borough		\$133.31	\$533.25	\$399.94	\$266.63	\$133.31
NJ0026735	TWO RIVERS WATER RECLAMATION AUTH	Rumson Borough	\$100.00		\$400.00	\$400.00	\$400.00	\$400.00
NJ0026735	TWO RIVERS WATER RECLAMATION AUTH	Sea Bright Borough		\$149.85	\$599.40	\$449.55	\$299.70	\$149.85
NJ0026735	TWO RIVERS WATER RECLAMATION AUTH	Shrewsbury Borough	\$90.00		\$360.00	\$360.00	\$360.00	\$360.00
NJ0026735	TWO RIVERS WATER RECLAMATION AUTH	Shrewsbury Township			AVT	AVT	AVT	AVT
NJ0026735	TWO RIVERS WATER RECLAMATION AUTH	Tinton Falls Borough	\$94.75		\$379.00	\$379.00	\$379.00	\$379.00
NJ0026735	TWO RIVERS WATER RECLAMATION AUTH	West Long Branch Borough	\$90.00		\$360.00	\$360.00	\$360.00	\$360.00
NJ0028009	WAYNE TWP-MOUNTAIN VIEW STP	Wayne Township	\$99.00		\$396.00	\$396.00	\$396.00	\$396.00
NJ0053009	WILDWOOD/LOWER REGION WTF	North Wildwood City	\$98.00		\$392.00	\$392.00	\$392.00	\$392.00
NJ0053010	WILDWOOD/LOWER REGION WTF	West Wildwood Borough	\$167.00		\$668.00	\$668.00	\$668.00	\$668.00
NJ0053011	WILDWOOD/LOWER REGION WTF	Wildwood City	\$98.00		\$392.00	\$392.00	\$392.00	\$392.00
NJ0053012	WILDWOOD/LOWER REGION WTF	Wildwood Crest Borough	\$87.53		\$350.12	\$350.12	\$350.12	\$350.12
NJ0027961	BERKELEY HEIGHTS WPCF	Berkeley Heights Twp			AVT	AVT	AVT	AVT
NJ0024678	BORDENTOWN SA BLACK'S CREEK STP	Bordentown Twp	\$86.12	\$44.40	\$522.08	\$477.68	\$433.28	\$388.88
NJ0023787	EAST WINDSOR WPCP	East Windsor Twp	\$81.70		\$326.80	\$326.80	\$326.80	\$326.80
NJ0024902	HANOVER SEWERAGE AUTHORITY WTP	Hanover Twp	\$58.50	\$86.55	\$234.00	\$493.65	\$407.10	\$320.55
NJ0024511	LIVINGSTON WATER POLL CONTROL FACILITY	Livingston Twp	\$25.80	\$41.89	\$270.77	\$228.88	\$186.98	\$145.09

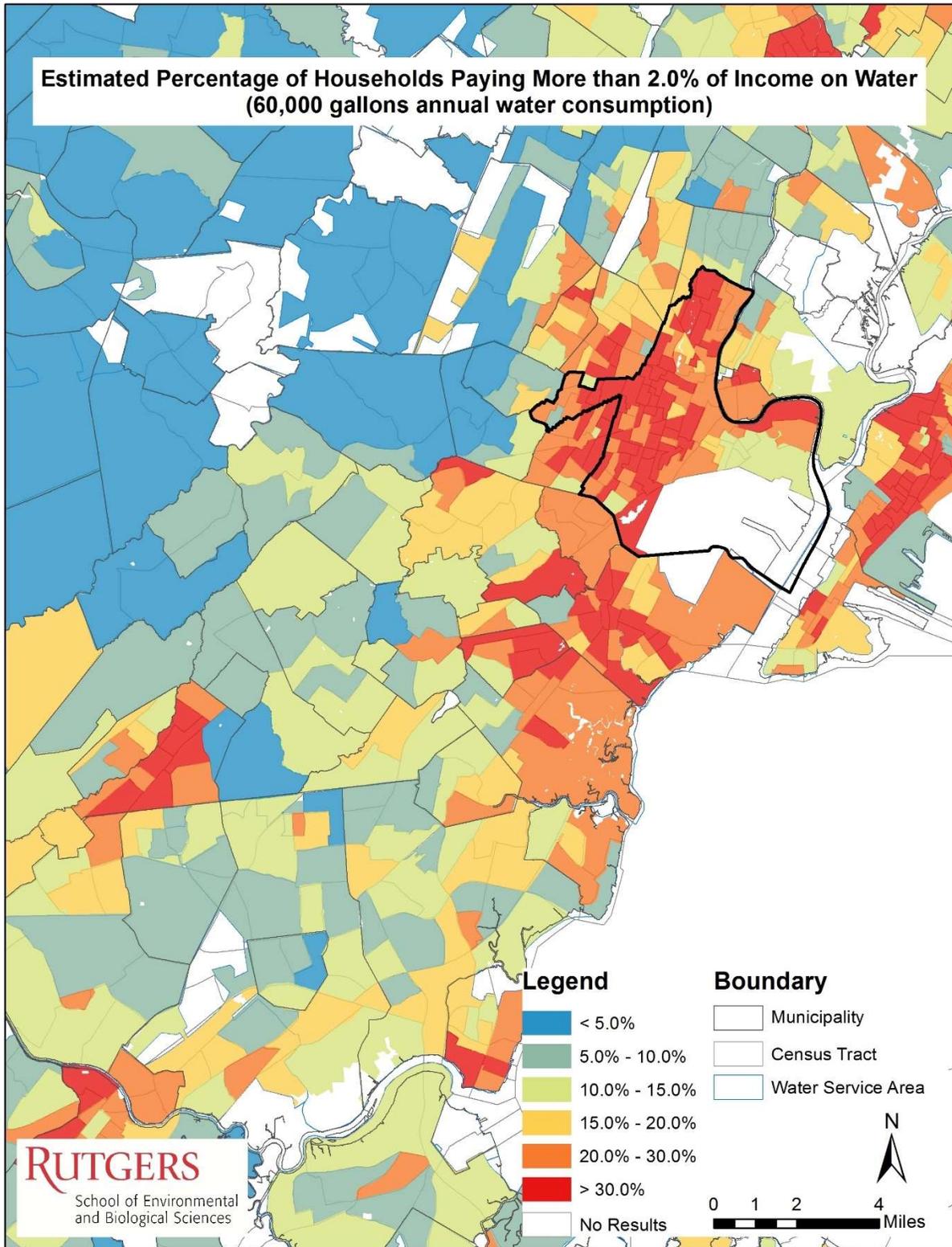
Assessing the Affordability of Water and Sewer Utility Costs in New Jersey

NJPDES Permit Number	Facility Name	Municipality	Base Charge (quarterly, single family residential)	Volume Charge (15K gallons per quarter)	Total Annual Cost (60K)	Total Annual Cost (45K)	Total Annual Cost (30K)	Total Annual Cost (15K)
NJ0024783	LONG BRANCH SEWERAGE AUTHORITY	Long Branch City	\$84.00		\$336.00	\$336.00	\$336.00	\$336.00
NJ0023809	LOWER TOWNSHIP MUA	Lower Twp	\$80.00		\$320.00	\$320.00	\$320.00	\$320.00
NJ0024911	MORRIS TOWNSHIP-BUTTERWORTH WPCF	Morris Twp	\$141.25		\$565.00	\$565.00	\$565.00	\$565.00
NJ0025178	MOUNT LAUREL HARTFORD RD WPCF	Mount Laurel Twp	\$0	\$0	\$387.00	\$290.25	\$193.50	\$96.75
NJ0024791	RIDGEWOOD VILLAGE WPC FACILITY	Glen Rock Boro	\$100.00		\$400.00	\$400.00	\$400.00	\$400.00
NJ0024791	RIDGEWOOD VILLAGE WPC FACILITY	Ridgewood Village			AVT	AVT	AVT	AVT
NJ0025038	SECAUCUS MUA	Secaucus Town		\$72.15	\$288.60	\$216.45	\$144.30	\$72.15
NJ0029386	TWO BRIDGES WW TREATMENT PLANT	Lincoln Park Boro	\$150.00		\$600.00	\$600.00	\$600.00	\$600.00
NJ0024490	VERONA TWP WTP	Verona Twp	\$87.50		\$350.00	\$350.00	\$350.00	\$350.00
NJ0022845	BERNARDS TWP-HARRISON BROOK STP	Bernards Twp	\$120.00		\$480.00	\$480.00	\$480.00	\$480.00
NJ0025330	CEDAR GROVE STP	Cedar Grove Twp	\$90.00		\$360.00	\$360.00	\$360.00	\$360.00
NJ0024007	CINNAMINSON SA	Cinnaminson Twp	\$148.00	\$33.00	\$724.00	\$691.00	\$658.00	\$625.00
NJ0024031	ELMWOOD WTP	Evesham Twp		\$120.00	\$480.00	\$360.00	\$240.00	\$120.00
NJ0033995	ENVIRONMENTAL DISPOSAL CORP	Bedminster Twp	\$75.00	\$94.24	\$676.98	\$582.73	\$488.49	\$394.24
NJ0025518	FLORHAM PARK WPCF	Florham Park Boro	\$173.00		\$692.00	\$692.00	\$692.00	\$692.00
NJ0030333	GREENWICH TOWNSHIP STP	Greenwich Twp	\$93.75		\$375.00	\$375.00	\$375.00	\$375.00
NJ0069167	MAPLE SHADE TWP PARK AVE WWTP	Maple Shade Twp		\$130.50	\$522.00	\$391.50	\$261.00	\$130.50
NJ0021636	NEW PROVIDENCE WWTP	New Providence Boro			AVT	AVT	AVT	AVT
NJ0026905	MONTGOMERY TWP STAGE II TP	Montgomery Twp	\$66.50	\$202.50	\$1,076.00	\$873.50	\$671.00	\$468.50
NJ0069523	MONTGOMERY TWP-CHERRY VALLEY STP	Montgomery Twp	\$66.50	\$202.50	\$1,076.00	\$873.50	\$671.00	\$468.50
NJ0067733	MONTGOMERY TWP-OXBRIDGE WWTP	Montgomery Twp	\$66.50	\$202.50	\$1,076.00	\$873.50	\$671.00	\$468.50
NJ0060038	MONTGOMERY TWP-PIKE BROOK STP	Montgomery Twp	\$66.50	\$202.50	\$1,076.00	\$873.50	\$671.00	\$468.50
NJ0022497	WARREN STAGE IV STP	Warren Twp	\$141.78		\$567.12	\$567.12	\$567.12	\$567.12
NJ0022489	WARREN TWP SEWER AUTH STAGE I-II STP	Warren Twp	\$141.78		\$567.12	\$567.12	\$567.12	\$567.12
NJ0050369	WARREN TWP-STAGE V STP	Warren Twp	\$141.78		\$567.12	\$567.12	\$567.12	\$567.12

AVT = Ad Valorem Tax (aka municipal property tax)

## Appendix C – Affordability Maps for Newark and Camden Areas

The following maps are derived from Figures 8 through 12 in the section [Utility Costs Relative to USEPA 1994 Guidance Thresholds](#), focused on the Newark and Camden metropolitan areas. These maps provide a useful understanding of how variable the affordability results can be within individual utility service areas. Please note that the Camden analyses were based on rate information available as of February 2018. Further analysis indicates that the Camden County Utilities Authority portion of the sewer utilities costs are lower than used here, but that Camden City charges sewer utility costs through its water rate schedule, resulting in an unknown modification (though lower) to both sewer and water costs for the city.



**Figure 14: Newark Area: Estimated Percentage of Households Paying More than 2.0% of Income on Water (60,000 gallons annual water consumption)**

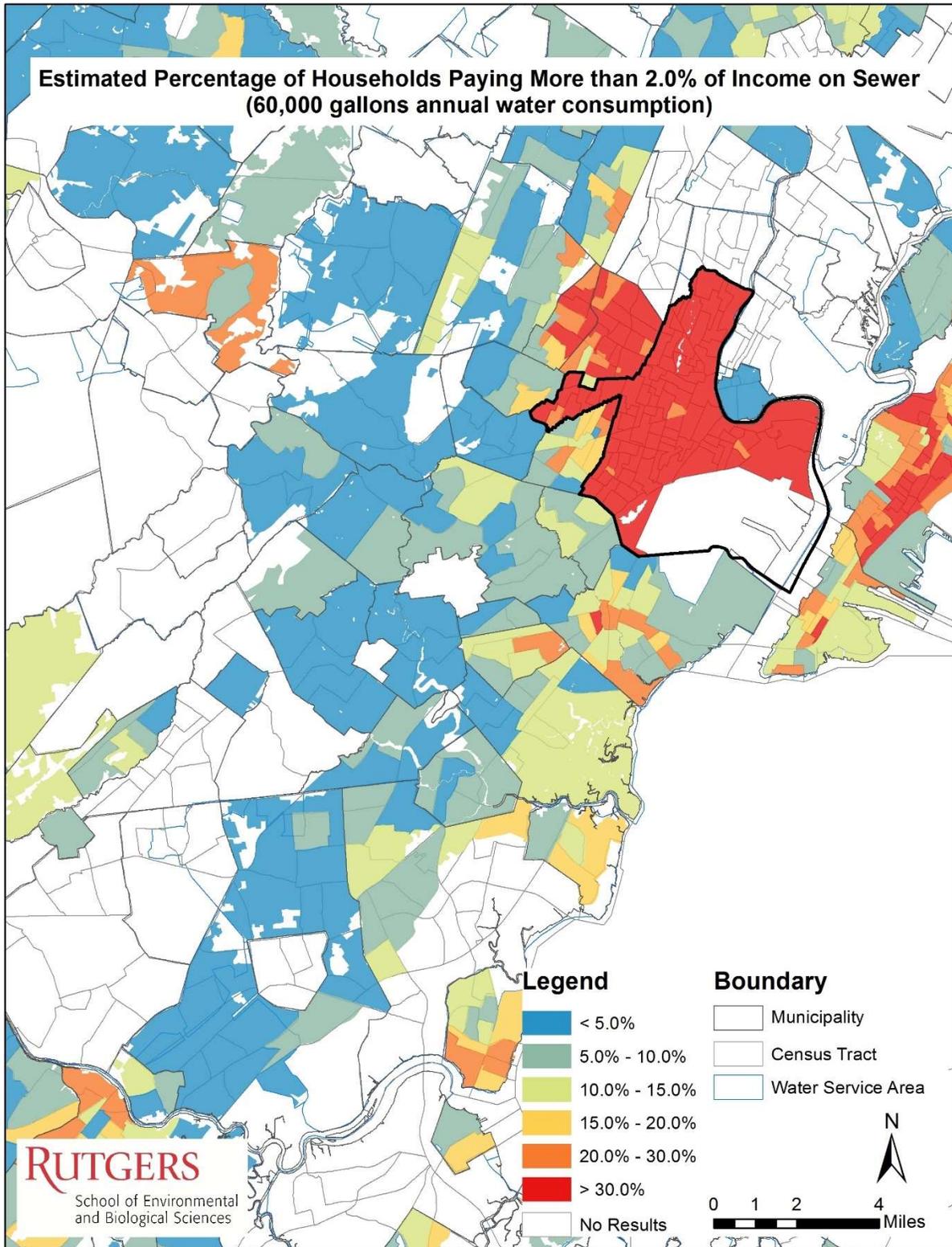
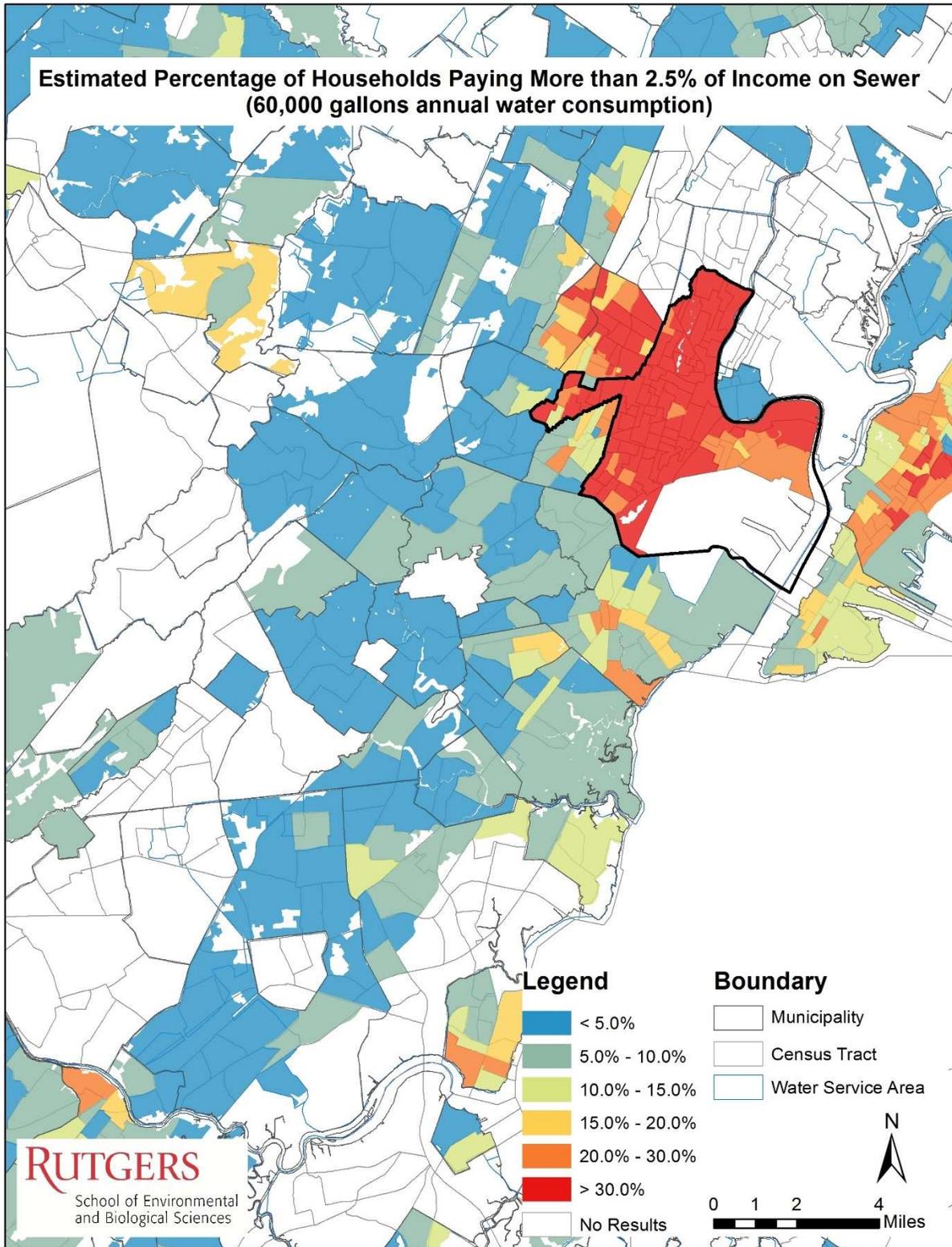


Figure 15: Newark Area: Estimated Percentage of Households Paying More than 2.0% of Income on Sewer (60,000 gallons annual water consumption)



**Figure 16: Newark Area: Estimated Percentage of Households Paying More than 2.5% of Income on Sewer (60,000 gallons annual water consumption)**

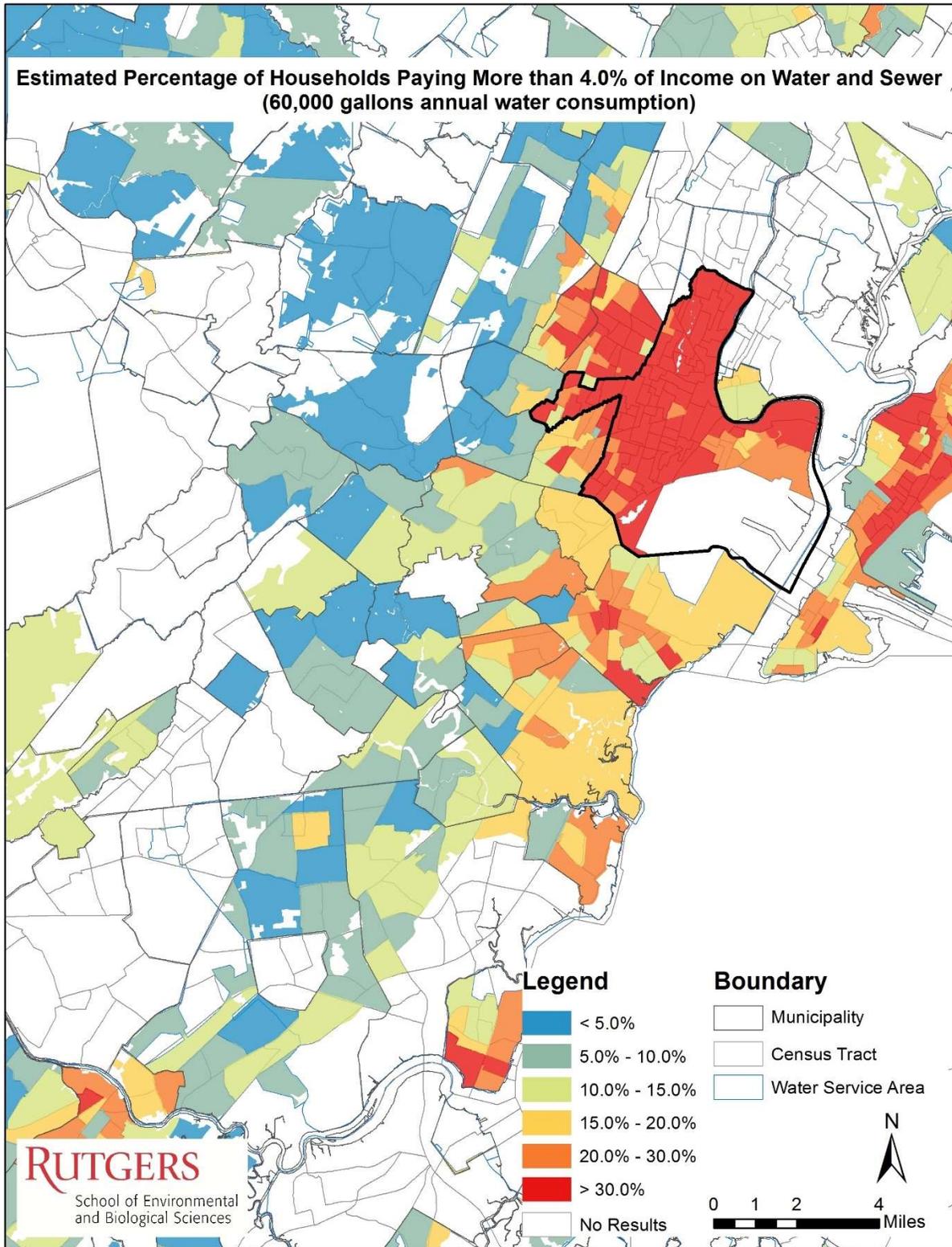


Figure 17: Newark Area: Estimated Percentage of Households Paying More than 4.0% of Income on Water and Sewer (60,000 gallons annual water consumption)

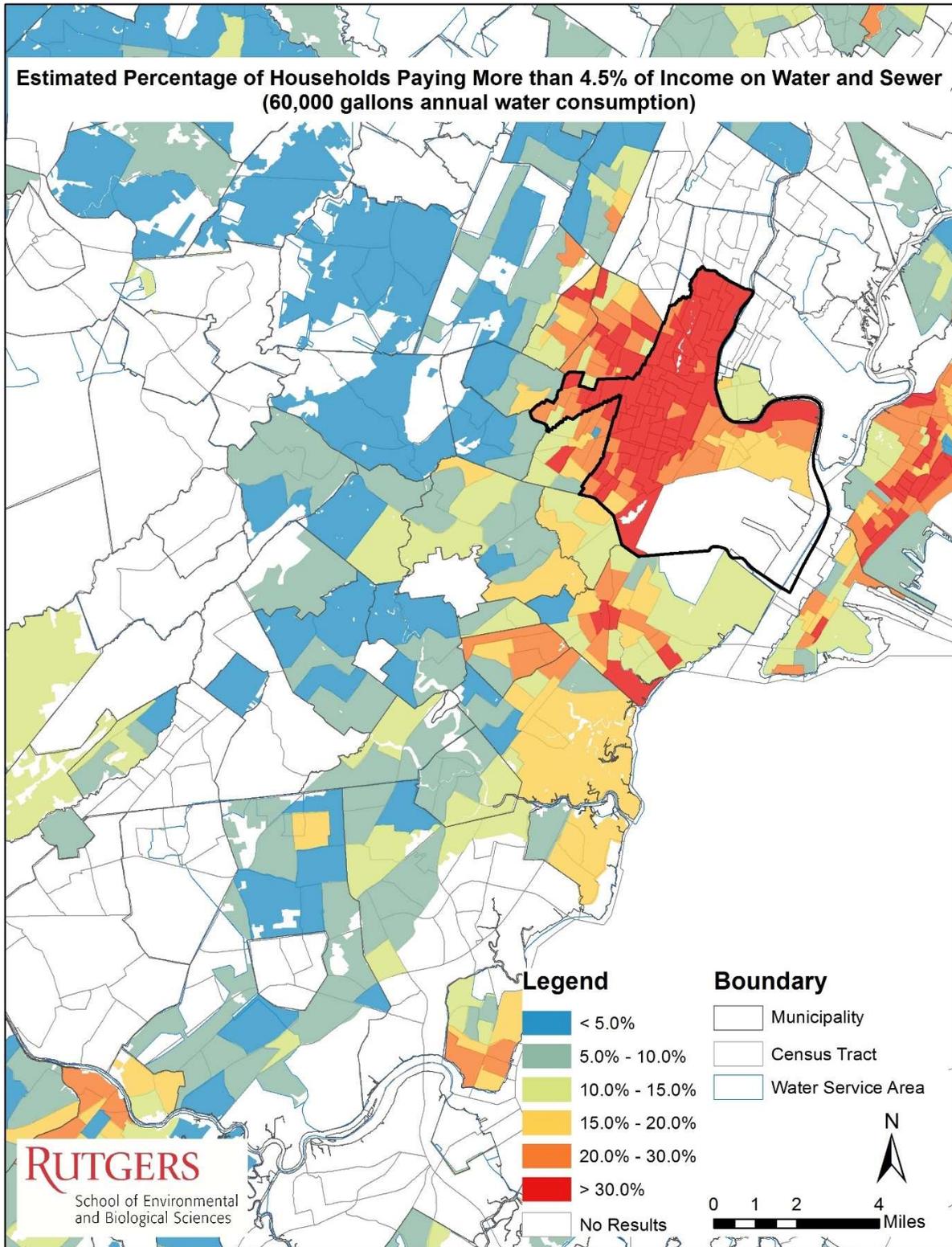
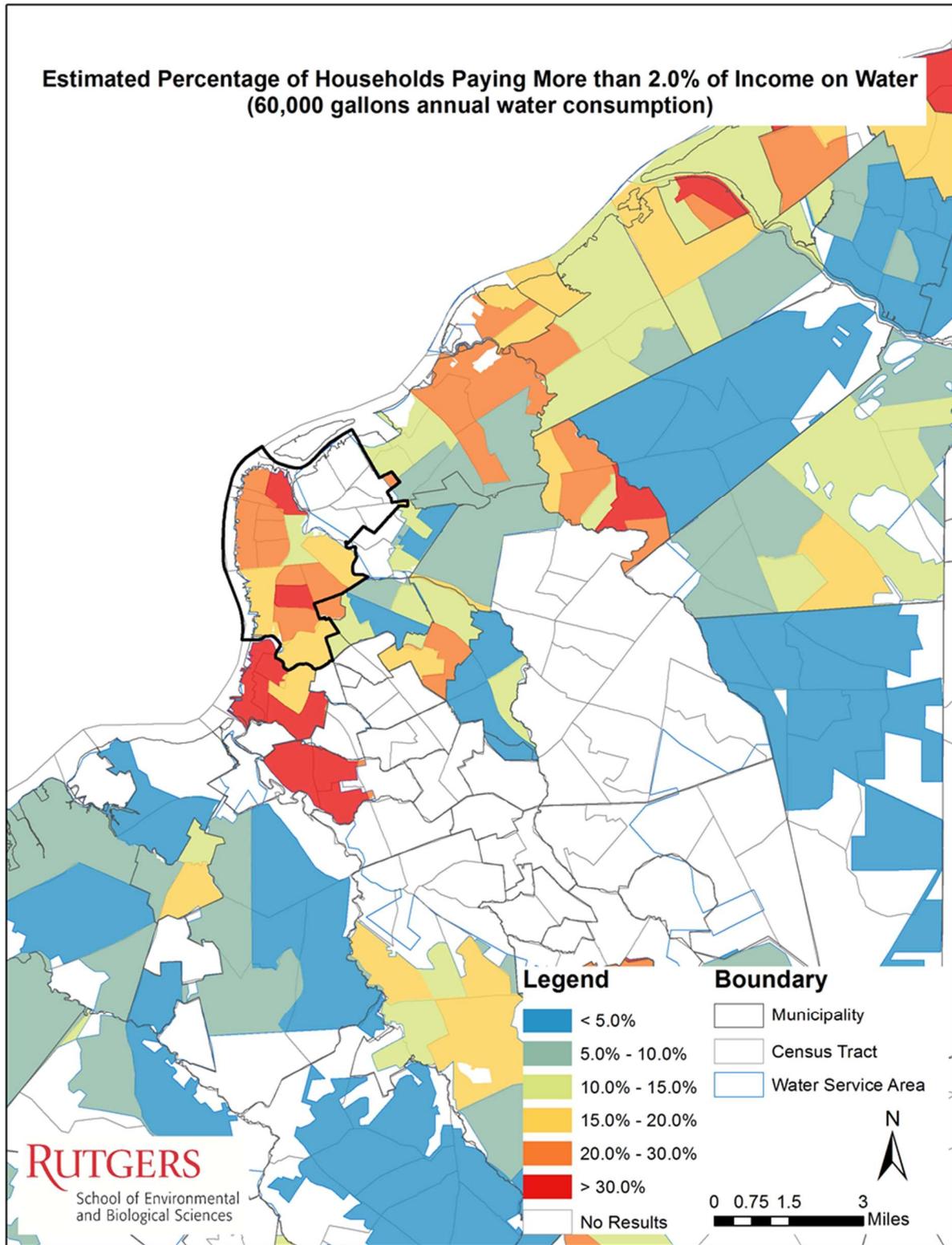
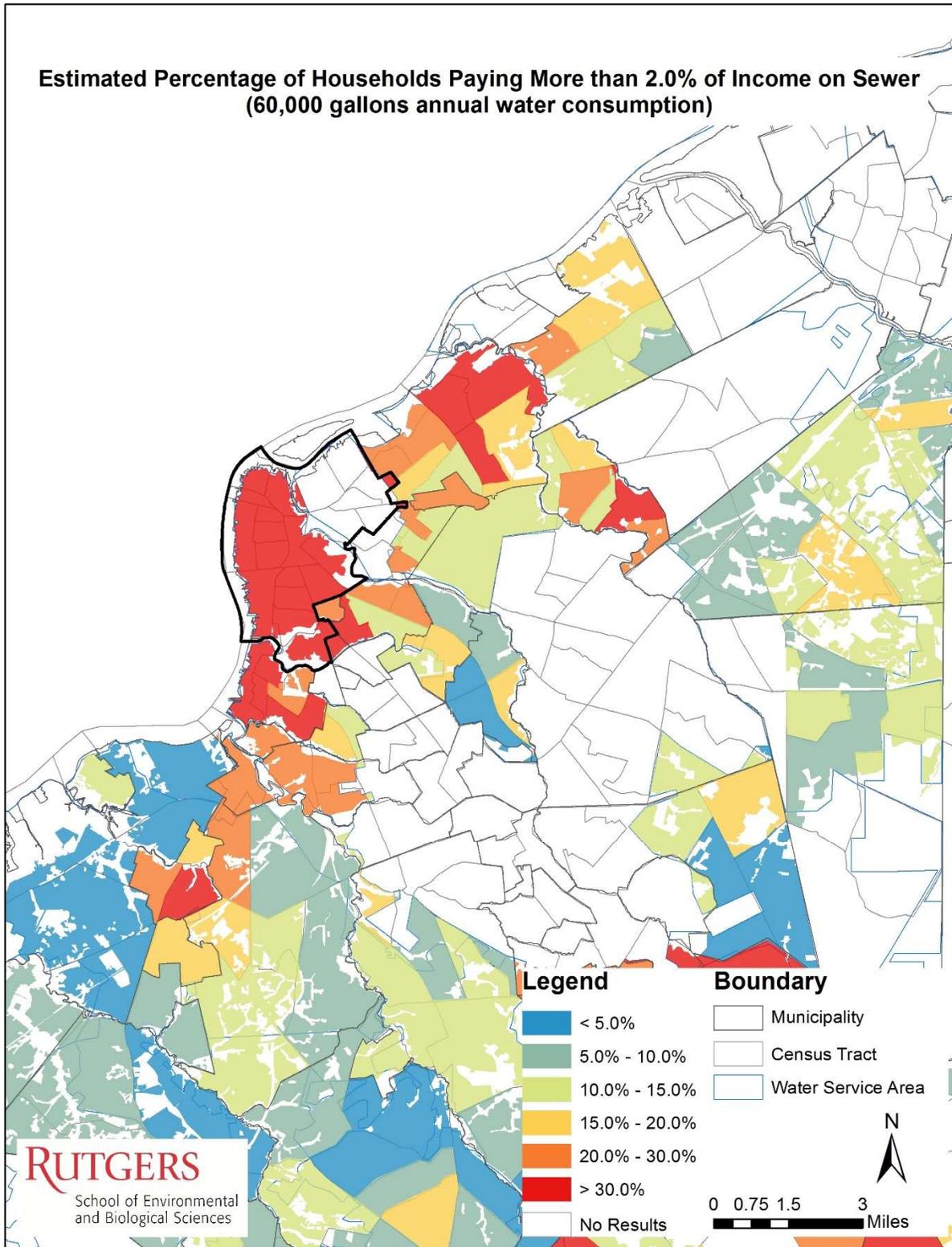


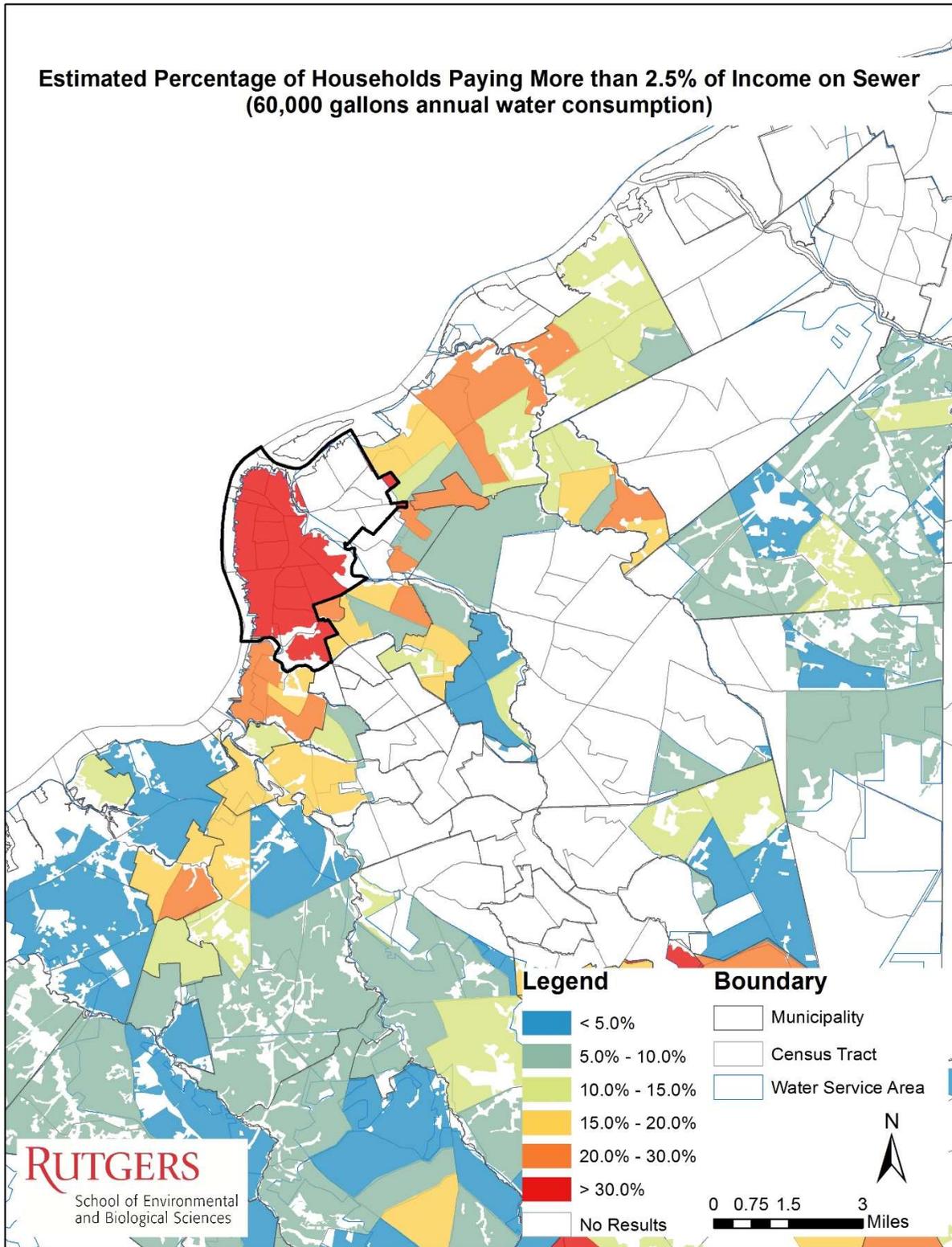
Figure 18: Newark Area: Estimated Percentage of Households Paying More than 4.5% of Income on Water and Sewer (60,000 gallons annual water consumption)



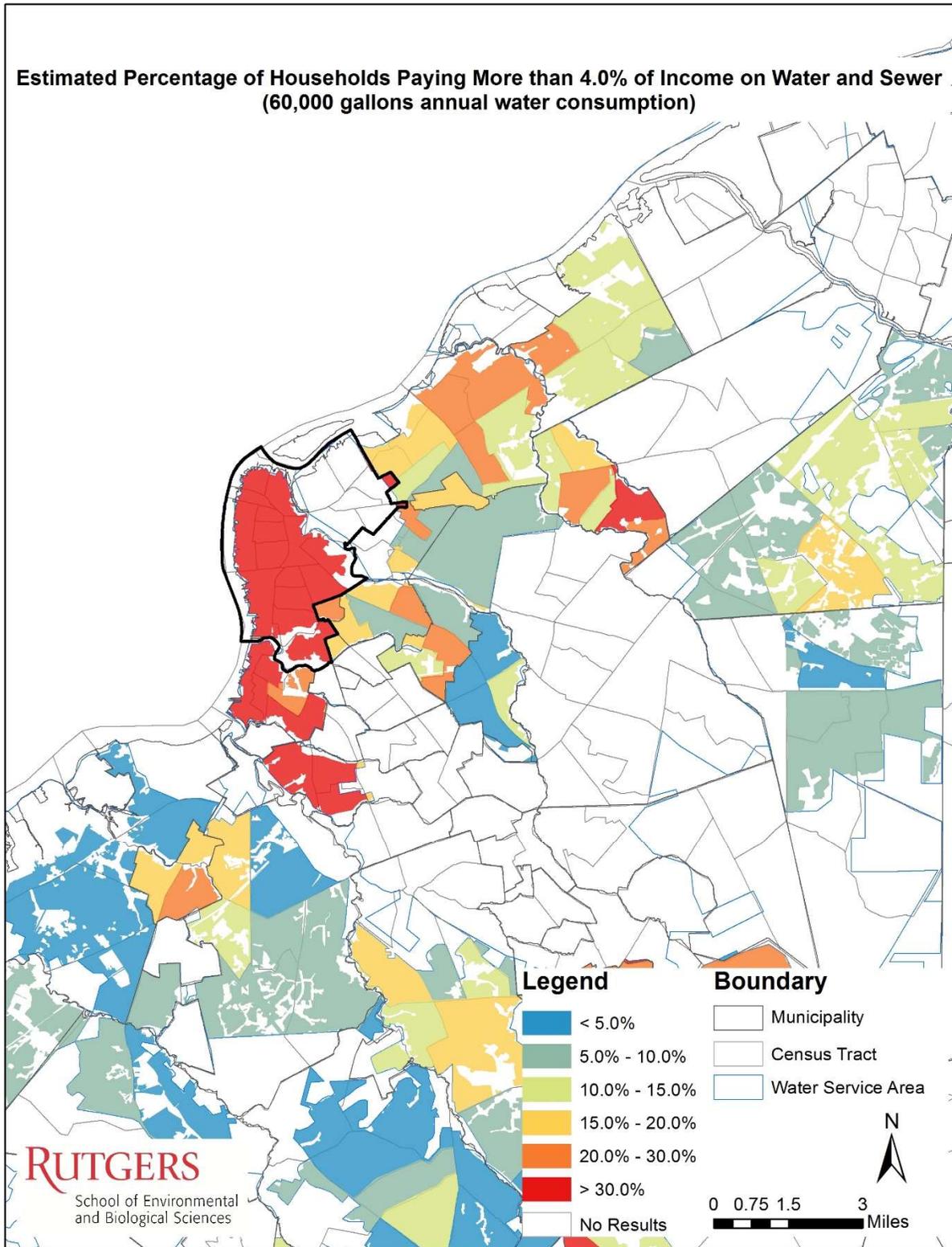
**Figure 19: Camden Area: Estimated Percentage of Households Paying More than 2.0% of Income on Water (60,000 gallons annual water consumption)**



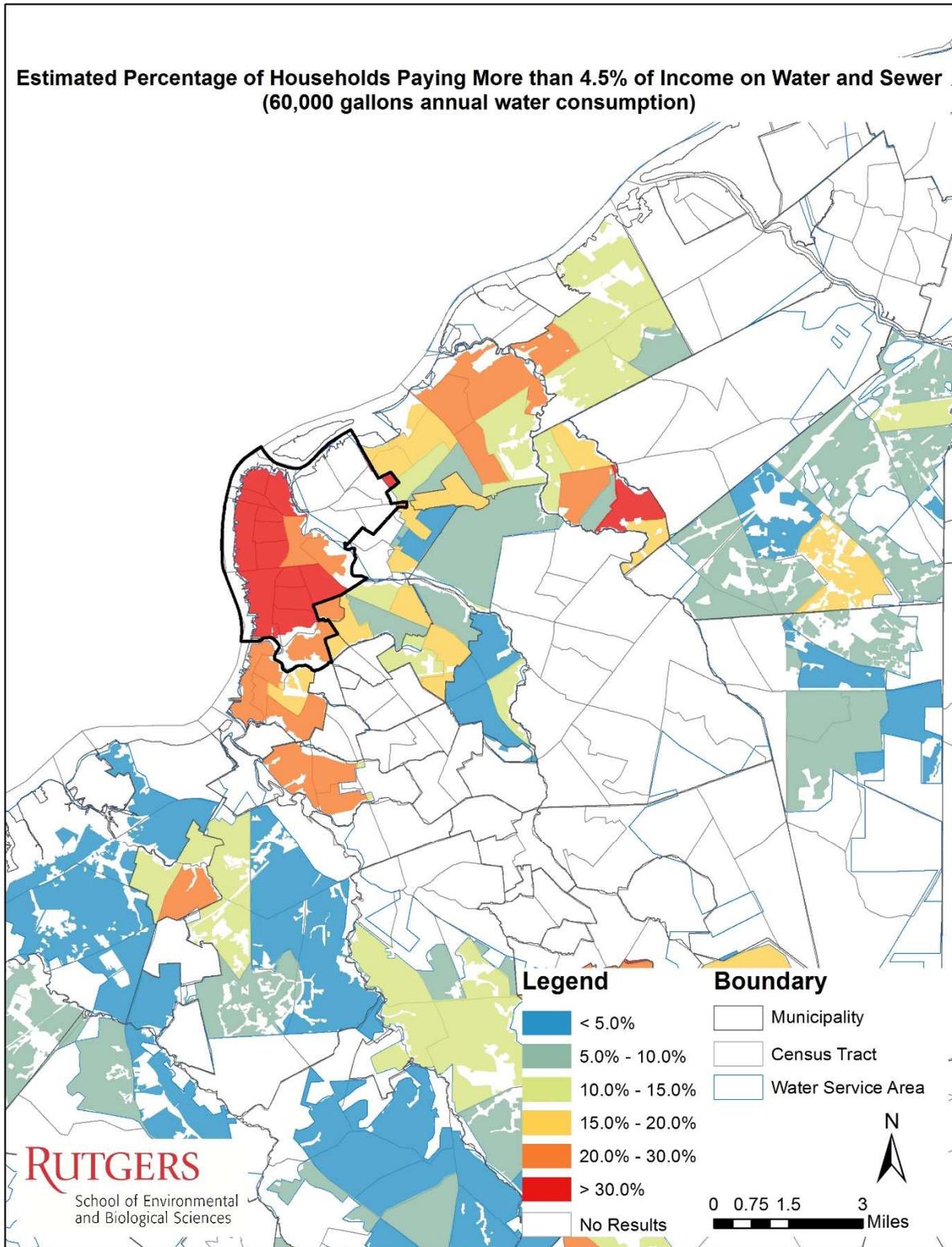
**Figure 20: Camden Area: Estimated Percentage of Households Paying More than 2.0% of Income on Sewer (60,000 gallons annual water consumption)**



**Figure 21: Camden Area: Estimated Percentage of Households Paying More than 2.5% of Income on Sewer (60,000 gallons annual water consumption)**



**Figure 22: Camden Area: Estimated Percentage of Households Paying More than 4.0% of Income on Water and Sewer (60,000 gallons annual water consumption)**



**Figure 23: Camden Area: Estimated Percentage of Households Paying More than 4.5% of Income on Water and Sewer (60,000 gallons annual water consumption)**