

**State Water Infrastructure Authority
North Carolina Department of Environment and Natural Resources**

December 10, 2015

**Environment and Natural Resources Building
217 West Jones Street
Room 5001
Raleigh, North Carolina**

The State Government Ethics Act (North Carolina General Statute § 138A) mandates that the Chair inquire as to whether there is any known conflict of interest or potential conflict of interest with respect to any matters before the Authority today. If any member knows of a conflict of interest or potential conflict of interest, please identify the conflict at the time the conflict becomes apparent.

The times indicated for each Agenda Item are merely for guidance. The Authority will proceed through the Agenda until completed.

AGENDA

Kim H. Colson, Authority Chair, Presiding

9:00 A. Call to Order – Chair Colson

1. Welcome
2. Reminder of Conflict of Interest and Compliance with State Government Ethics Act
3. Please set electronic devices to off or vibrate

9:05 B. Approval of Minutes (Action Items)

1. September 17, 2015 Authority Meeting
2. October 15, 2015 Authority Meeting via Conference Call
3. October 22, 2015 Authority Meeting via Conference Call

9:10 C. Attorney General’s Office Report – Phillip Reynolds

9:15 D. Chair’s Remarks – Chair Colson

9:20 E. Legislative Update – Chair Colson

9:25 F. Ethics Education and Statement of Economic Interest Filing – Francine Durso

9:35 G. 2016 Meeting Schedule – Francine Durso (Action Item)

9:40 H. Summary of Applications Received for Sept. 30, 2015 Funding Round: Community Development Block Grant-Infrastructure (CDBG-I), Drinking Water SRF and Clean Water SRF – Seth Robertson

9:50 I. Affordability Criteria – Jennifer Haynie (Action Item)

10:50 Break

11:05 J. State Project Grant Priority System Update – Seth Robertson (Action Item)

- 11:20 K. Asset Inventory and Assessment Grant – Amy Simes (Action Item)**
 - 12:00 Lunch**
 - 1:00 L. Merger/Regionalization Feasibility Grant – Matthew Rushing (Action Item)**
 - 1:30 M. Master Plan Committee Report – Committee Chair Maria Hunnicutt**
 - 1:45 N. Troubled System Protocol Update – Jessica Leggett and Francine Durso**
 - 2:00 O. Planning for 2016 Work – Francine Durso**
 - 2:15 P. Informal Comments from the Public**
 - 2:30 Q. Concluding Remarks by Authority Members, Chair and Counsel**
 - 2:45 R. Adjourn**
-

State Water Infrastructure Authority
North Carolina Department of Environment and Natural Resources
September 17, 2015
Meeting Minutes

State Water Infrastructure Authority Members Attending Meeting

- Kim Colson, Chair; Director, Division of Water Infrastructure
- Leila Goodwin, Water Resources Manager, Town of Cary
- Robin Hammond, Assistant General Counsel, Local Government Commission
- Maria Hunnicutt, Manager, Broad River Water Authority
- Dr. Patricia Mitchell, Assistant Secretary, Rural Development Division, Department of Commerce
- JD Solomon, Vice President, CH2MHill
- Cal Stiles, Cherokee County Commissioner

Division of Water Infrastructure Staff Attending Meeting

- Julie Haigler Cubeta, Supervisor, Community Block Development Grant – Infrastructure Unit
- Francine Durso, Project Manager, Special/Technical Issues Unit
- Jennifer Haynie, Supervisor, Environmental and Special Projects Unit
- Seth Robertson, Chief, State Revolving Funds Section
- Amy Simes, Project Manager, Drinking Water Projects Unit
- Jessica Leggett, Project Manager, Environmental and Special Projects Unit
- Matthew Rushing, Project Manager, Drinking Water Projects Unit
- Jeanne Fletcher, Administrative Services Unit

Department of Justice Staff Attending Meeting

- Phillip Reynolds, North Carolina Department of Justice; Assistant Attorney General, Environmental Division

Item A. Call to Order

Mr. Colson opened the meeting and reminded the members of the State Water Infrastructure Authority (SWIA) of General Statute 138A-15 which states that any member who is aware of a known conflict of interest or an appearance of a conflict of interest with respect to matters before the Authority today is required to identify the conflict or appearance of a conflict at the time the conflict becomes apparent.

Item B. Approval of Minutes of July 2015 Authority Meeting

Mr. Colson presented the draft meeting minutes from the July 2015 Authority meeting for review and approval.

Action Item B:

- Ms. Hammond made a motion to approve the July 23, 2015 Authority meeting minutes. Dr. Mitchell seconded the motion. The motion passed unanimously.

Item C. Attorney General's Office Report

Mr. Reynolds had no items on which to report.

Item D. Chair's Remarks

The application deadline for the CWSRF, DWSRF and CDBG-I programs is September 30. Since the legislature has not approved a budget for fiscal year 2015/2016, it will not be possible to accept fall applications for the State Reserve programs; these applications will be accepted in March 2016. The Division held six application training sessions around the state in July and August which were attended by over 130 people.

Item E. Legislative Update

The changes to NCGS 159G recommended by the Authority in its 2014 Annual Report have been included in the proposed House and Senate budgets with a change by the Senate to the proposed definition of affordability. Mr. Colson noted that the new grants for Asset Inventory and Assessment, and Merger/Regionalization Feasibility will replace the former technical assistance grants (TAGs) if passed. The draft budget for the State Reserve grants program includes an increase of \$5 million per year on a recurring basis, and non-recurring funds for the state grants program include \$2.4 million in 2015-2016, and \$5 million in 2016-2017 are proposed. The total amount of state grant funds that could be available over the biennium is \$27.4 million. The Connect NC bond bill appears to be moving forward and includes additional funding for water and wastewater infrastructure at this time.

Item F. Draft 2016 Meeting Schedule

Under the Authority's Internal Operating Procedures, prior to the first meeting of a calendar year it must approve a schedule of regular meetings for the subsequent calendar year. A list of potential meeting dates for 2016 was presented noting that the Authority has already approved the meeting date of January 21, 2016. Authority members will check for conflicts; approval of meeting dates will be an action item at the December 2015 meeting.

Item G. Affordability Criteria Development

The House and Senate budget proposals both include the Authority's recommendation to use affordability criteria as a way to pair a grant with a loan offer thereby maximizing the current funding resources. The pairing of funding could potentially be implemented for the spring 2016 application round. A number of parameters have been evaluated, some of which are inherent to the local government unit (LGU) such as income, population change, and poverty rate; and some are under the control of the LGU such as days cash on hand, operating ratio, and utility rates. Considering a combination of these parameters provides balanced criteria. As the Division analyzes these parameters, it is using only information that is available from the Local Government Commission (LGC). Staff presented updated information on the criteria development. Question: do utilities operate with operating ratios less than 1? A: Yes, many do and if depreciation was factored in it is likely that number would be higher; currently the Division does not include depreciation because there are so many different ways that it can be calculated that it would not be comparable from one system to another. The Authority discussed and generally supported the proposed parameters; based on the discussion and additional research, staff will present updated information at the December meeting.

Item H. Asset Management Update

The House and Senate budget proposals both include the Authority's recommendation to provide State Reserve grant funds for infrastructure asset inventory and assessment work; these grants could potentially be implemented for the spring 2016 application round. Staff presented draft goal statements which the Authority supported with a few suggested changes which will be incorporated. Staff presented the potential process, deliverables, and criteria for applicant prioritization. The Authority

noted that the transition from the assessment stage to the project development stage will be very important; that the intent is for the CIP to be prepared with grant funds will be updated every two years; and that the affordability criteria that is being developed should be applied when considering the applicant's match. The Authority acknowledged the possibility of funding for two types of applicants: those that have done little to no asset-type work; and those that already taken some steps toward asset management. Regarding the application components, the Authority emphasized that a utility's budget for capital improvements and maintenance is needed so it can be compared with its actual expenditures and that trends were also important; and that it encourages applicants to search for partners for GIS or other capabilities which it may not have internally and to demonstrate how the inventory will be kept updated after the grant is completed. Based on the Authority's discussion and additional research, staff will present updated information at the December meeting.

Item I. Merger/Regionalization Feasibility Grant Update

The House and Senate budget proposals both include the Authority's recommendation to provide State Reserve grant funds for merger/regionalization feasibility studies; these grants could potentially be implemented for the spring 2016 application round. This is the first presentation of information by staff regarding the potential criteria and deliverables for this grant. The Authority generally supported the concept of a "business plan" as the deliverable to include life cycle costs and rates needed to support each of the alternatives explored, resulting in the preferred path forward and how the utility will fund the capital, operation and maintenance, reinvestment and reserves needed for the work. Based on the Authority's discussion and additional research, staff will present updated information in December.

Item J. State of the States: Water Loss Management in the US

Mr. Will Jernigan, PE and Mr. Tory Wagoner, PE with Cavanaugh Associates gave a presentation about water loss management policies in the US. Most states have either no policies or require basic water loss reporting; North Carolina requires basic reporting in its local water supply plans. A few states require annual water loss reporting using the AWWA free water audit software; Georgia, Texas and California are the most stringent requiring this method along with a validation of the submitted audit. The presenters noted that drastic droughts in Georgia and California spurred these requirements. One of the key messages is that water loss/ unaccounted for water as a percentage of supply is not an indicator of performance because it does not segregate loss into its components for effective management. A key topics was the importance of linking the volume of non-revenue water to its monetary value because there is little understanding of the degree to which loss can affect a community's finances – potentially millions of dollars in revenue is not realized from water and sewer billings. Other topics included the common occurrence of finished water meters that fail required testing and the realization by utilities that "the more money/water we find, the less we may need to borrow for capital projects." The Authority discussed the inclusion of these concepts in the master plan and the potential to incentivize improved water loss management by including it in future priority criteria for grants. They appreciated Cavanaugh's presentation.

Item K. Troubled Systems Protocol Update

A discussion of the challenges faced by small systems was held with the Mayor of the Town of Eureka, the Honorable Mr. J.D. Booth, and the Town Administrator of the Town of Fremont, Ms. Barbara Aycock. The purpose of the discussion was for the Authority to gain insight into infrastructure issues faced by small systems which it can then consider as it develops the troubled systems protocol. Each town gave an overview with focus on sewer issues. Some themes that emerged included lack of personnel to maintain their infrastructure, lack of funds to hire someone to provide maintenance, and construction-

related problems possibly due to lack of adequate inspection/oversight. Neither town had a plan to save funds to be able to address renewal work that will be needed in the future. The Authority thanked Mr. Booth and Ms. Aycock for their openness and willingness to discuss these issues.

Staff had analyzed information provided by the LGC to look for factors that may be common to potentially struggling LGUs. Key issues appear to be organizational and financial such as internal controls, audited financials, low cash balances, etc. for 28 of the same LGUs that the LGC has contacted about these issues for the past three to four years. The Division identified that nearly 80% of these LGUs have several common characteristics:

- Populations of 2,100 people or less (ranges from 300 to 6,000 people);
- A median household income of about \$37,000 which is below the state average of \$45,300 (ranges from \$16,000 to \$55,000); and
- Four months or less of cash on hand (ranges from 0 to 24 months).

The Authority discussed that such information is helping frame the range and magnitude of the troubled systems problem and there may be a need to be able to fund some type of planning to help the LGUs define their problem and next steps for them to become viable, which could involve a merger/ regionalization. Based on the Authority's discussion and additional research, staff will present updated information in December.

Item L. Master Plan Committee Report

Master Plan Committee Chair Hunnicutt summarized the work of the Committee and presented the Committee's draft Master Plan Vision. The message of working to become viable, taking responsibility for becoming self-sufficient, and not expecting grant funds to support a utility is key to the plan. The Authority discussed and supports the following as the vision statement:

The State will best be able to meet its water infrastructure needs by ensuring utilities are, or are on a path to be, viable systems. A viable system is one that functions as a business enterprise, establishes organizational excellence, and provides appropriate levels of infrastructure maintenance, operation, and reinvestment – including reserves for unexpected events – that allows the utility to provide reliable water services now and in the future.

The gap in funding of water and sewer infrastructure needs in the state is not truly known, partly due to the fact that the industry has not been encouraged to look ahead and do the planning needed to adequately quantify needs. Division staff discussed with the UNC-CH School of Government Environmental Finance Center (EFC) their potential ability to provide data analysis to at least begin to develop a possible range of needs, acknowledging the uncertainty around the numbers, and based on information that is already available. It is anticipated that the draft plan will be completed in the spring of 2016 and the Division will then seek stakeholder input. Based on consideration of the input by the Authority, the plan will be revised. Staff continues to draft the plan and the Committee will report to the Authority again in December.

Item M. Draft 2015 Authority Annual Report

Staff presented the draft of the Authority's Annual Report which is due to committees of the legislature by Nov. 1. The Authority supports the content of the draft report and provided comments. Staff will revise the report and discuss finalization with the Authority during a Special Meeting by Conference Call to be held on Oct. 15; a second conference call may be needed on Oct. 22 based on further comments.

Item N. Informal Comments from the Public

Mr. Colson stated that public comments could be made at this time with the reminder that in accordance with the Authority's Internal Operating Procedures, comments must be limited to the subject of business falling within the jurisdiction of the Authority and should not be project specific. There were no informal comments from the public.

Item O. Concluding Remarks by Authority Members, Chair, and Counsel

Mr. Solomon stated that he had submitted an abstract for the AWWA-WEF Utility Management Conference in Feb. 2016 in which he would present information about the Authority and its work. The next Authority meeting dates were confirmed for December 10, 2015 and January 21, 2016. A draft schedule for 2016 meetings will be presented as an action item in December.

Item P. Adjourn – The meeting was adjourned.

DRAFT

State Water Infrastructure Authority
North Carolina Department of Environment and Natural Resources
October 15, 2015
Special Meeting via Conference Call – Meeting Minutes

State Water Infrastructure Authority Members Attending Meeting

- Kim Colson, Chair; Director, Division of Water Infrastructure
- Leila Goodwin, Water Resources Engineer
- Robin Hammond, Assistant General Counsel, Local Government Commission (via conference call)
- Maria Hunnicutt, Manager, Broad River Water Authority (via conference call)
- Dr. Patricia Mitchell, Assistant Secretary, Rural Development Division, Department of Commerce (via conference call)
- JD Solomon, Vice President, CH2MHill (via conference call)
- Cal Stiles, Cherokee County Commissioner (via conference call)
- Charles Vines, Manager, Mitchell County (via conference call)

Division of Water Infrastructure Staff Attending Meeting

- Julie Haigler Cubeta, Supervisor, Community Block Development Grant – Infrastructure Unit
- Francine Durso, Project Manager, Special/Technical Issues Unit
- Jennifer Haynie, Supervisor, Environmental and Special Project Unit
- Seth Robertson, Chief, State Revolving Funds Section
- Amy Simes, Project Manager, Drinking Water Project Unit

Department of Justice Staff Attending Meeting

- Phillip Reynolds, North Carolina Department of Justice; Assistant Attorney General, Environmental Division (via conference call)

Item A. Call to Order

Mr. Colson opened the meeting and reminded the members of the State Water Infrastructure Authority (SWIA) of General Statute 138A-15 which requires any member who is aware of a known conflict of interest or an appearance of a conflict of interest with respect to matters before the Authority today is required to identify the conflict or appearance of a conflict at the time the conflict becomes apparent. A roll call was taken to determine which Authority members were present via conference call.

Item B. Revised Draft November 1, 2015 Report to Legislative Committees

The Division had provided the Authority with a draft revised Annual Report based on the Authority's comments provided during the Sept. 17, 2015 Authority meeting. Staff reviewed the key modifications to the report which included expanding information about: state grant funding amounts; the new state grants for asset inventory and assessment, and merger/regionalization feasibility; long-term viability; and the need for risk-based project prioritization.

Authority members provided additional comments regarding the best way to organize and present the primary issues identified in 2015 by the Authority, and the next steps to be taken in the coming year. Division staff will revise the draft report based on these comments. A second Special Meeting via Conference Call is scheduled for October 22, 2015 to receive the Authority's comments on the revised draft.

Item C. Process for Roll Out of Annual Report

At its Sept. 2015 meeting, the Authority briefly discussed ways to distribute the Annual Report after completion. The Authority agreed that a press release would be appropriate as well as sending the report to the professional associations with which the Authority has been working. Ms. Hammond added that the LGC could send a message on its list serve for financial officers with a link to the report.

Item D. Draft 2016 Meeting Schedule

A draft 2016 meeting schedule had been presented to the Authority at its Sept. 2015 meeting; the schedule needed to be revised based on Authority member conflicts with some of the proposed dates. A revised draft 2016 meeting schedule was presented with the staff recommendation that if there were no conflicts, the Authority could approve the meeting schedule at its December 10, 2015 meeting. No conflicts were noted by Authority members.

Item E. Concluding Remarks by Authority Members, Chair, and Counsel

Mr. Colson stated that the next in-person Authority meeting would be on Thursday, December 10, 2015.

Item F. Adjourn – The meeting was adjourned.

DRAFT

State Water Infrastructure Authority
North Carolina Department of Environment and Natural Resources
October 22, 2015
Special Meeting via Conference Call – Meeting Minutes

State Water Infrastructure Authority Members Attending Meeting

- Kim Colson, Chair; Director, Division of Water Infrastructure
- Robin Hammond, Assistant General Counsel, Local Government Commission (via conference call)
- Maria Hunnicutt, Manager, Broad River Water Authority (via conference call)
- Dr. Patricia Mitchell, Assistant Secretary, Rural Development Division, Department of Commerce (via conference call)
- Cal Stiles, Cherokee County Commissioner (via conference call)
- Charles Vines, Manager, Mitchell County (via conference call)

Division of Water Infrastructure Staff Attending Meeting

- Francine Durso, Project Manager, Special/Technical Issues Unit
- Jennifer Haynie, Supervisor, Environmental and Special Project Unit

Item A. Call to Order

Mr. Colson opened the meeting and reminded the members of the State Water Infrastructure Authority (SWIA) of General Statute 138A-15 which requires any member who is aware of a known conflict of interest or an appearance of a conflict of interest with respect to matters before the Authority today is required to identify the conflict or appearance of a conflict at the time the conflict becomes apparent. A roll call was taken to determine which Authority members were present via conference call.

Item B. Revised Draft November 1, 2015 Report to Legislative Committees

The Division had provided the Authority with a draft revised Annual Report based on the Authority's comments provided during the Oct. 15, 2015 Authority meeting via conference call. In addition, Authority member Leila Goodwin had emailed the Authority that she had minor comments that she would discuss with staff outside the conference call. Staff reviewed the key modifications to the report and the Authority did not provide any additional comments.

Action Item B

- Dr. Mitchell made a motion to approve the report for submittal by staff by November 1, 2015 subject to working with Ms. Goodwin to make the minor changes she would suggest. The motion was seconded by Mr. Vines. The motion passed unanimously.

Item C. Concluding Remarks by Authority Members, Chair, and Counsel

Mr. Colson stated that the next in-person Authority meeting would be on Thursday, December 10, 2015.

Item D. Adjourn – The meeting was adjourned.

State Water Infrastructure Authority
Meeting Date: December 10, 2015
Agenda Item G – 2016 Meeting Schedule

Division of Water Infrastructure Staff Report

Background

Under the Internal Operating Procedures for the North Carolina State Water Infrastructure Authority, adopted by the Authority on February 20, 2014, Article III, Section 2 provides that prior to the first meeting of each calendar year the Authority shall approve a schedule of regular meetings for the subsequent calendar year (regular meetings).

Note, however, that after the year’s schedule has been approved, the Chair is authorized under Article III, Section 2 to make changes to the meeting dates if required with at least 7 calendar days’ notice.

Staff Recommendation

Staff recommends that the Authority approve the schedule of regular meetings for the calendar year 2016 as shown in the table below.

In addition, staff suggests that the Authority consider establishing a standing meeting schedule going forward with meetings to be held on the 3rd Wednesday in the months of January, April, July, September, October, and December of each year. This schedule will provide for six meetings per year which exceeds the statutory requirements to meet at least four times per year.

Date of Regular Meetings in 2016	
January 21 (Authority has already approved this date)	3rd Thursday
April 20	3rd Wednesday
July 20	3rd Wednesday
September 21	3rd Wednesday
October 19	3rd Wednesday
December 14	<u>2nd</u> Wednesday

State Water Infrastructure Authority
Meeting Date – December 10, 2015
Agenda Item I – Affordability Criteria

Division of Water Infrastructure Staff Report

Background

North Carolina General Statute G.S. 159G-71 contains the powers and the duties of the State Water Infrastructure Authority which include the following:

- To establish priorities for making loans and grants consistent with federal law
- Develop guidelines for making loans and grants
- Make recommendations on ways to maximize the use of current funding resources and ensure that funds are used in a coordinated manner

In September 2015, the legislature revised NCGS 159G to include the following definition of affordability:

- The relative affordability of a project for a community compared to other communities in North Carolina based on factors that shall include, at a minimum, water and sewer service rates, median household income, poverty rates, employment rates, or the population of the served community, and past expenditures by the community on water infrastructure compared to that community's capacity for financing of water infrastructure improvements

Division staff has presented information and received input from the Authority at previous meetings and will present three methods to implement the affordability criteria for consideration. It is anticipated that the Authority will provide final approval of the criteria at its meeting on January 21, 2016, and the criteria will be applied to the March 2016 application funding round.

Overview

The attached document provides information about the affordability criteria which will be presented at the Authority meeting by Division staff. The document includes:

- I. Purpose
- II. Overview
- III. Document Arrangement
- IV. Affordability Criteria Methodology
- V. Preliminary Results
- VI. Summary of Requests for Authority Input

Staff is seeking Authority input on a number of items; these are highlighted within the document in gray boxes and are summarized in Section VI.

A spreadsheet entitled Draft Affordability Methodology was also transmitted to the Authority.

Staff Recommendations

Staff recommends that the Authority approve the staff to solicit public comment on the proposed affordability criteria methodology.

Agenda Item I – Affordability Criteria Analysis

I. Purpose

The State Water Infrastructure Authority (Authority), in its 2014 Annual Report, recommended modifications to NCGS 159G to change from the High-Unit Cost (HUC) threshold in determining state grant eligibility to a new “affordability” criteria. In addition to qualifying for a grant, the new affordability criteria would also be used to set the amount of a grant to a percentage of overall project costs. The General Assembly passed and the Governor signed into law these changes as part of the biennium budget (SL2015-241). The purpose of this staff report is to provide the Authority with an understanding of the methodology being proposed by Division staff to use in determining the grant/loan mix for funding offered by the Division. The Division’s and the Authority’s work is reflective of the duties of the Authority as provided in NCGS 159G-71, specifically to:

- Maximize the use of current funding resources;
- Review the criteria for making loans and grants; and
- Establish priorities for making loans and grants.

II. Overview

In proposing the new affordability criteria, the Division examined several different sources for the basis of the proposal. First, the Division reviewed the definition that was passed by the General Assembly contained in NCGS 159G-20.(1) (see inset). The Division also considered the Authority’s draft vision statement for the State’s Master Plan that reflects the need for utilities to be, or on a path to be, viable enterprise systems. In addition, the proposal also considers the Local Government Finance Act (NCGS 159) that reflect enterprise system financial requirements and the adherence to Generally Accepted Accounting Principles (GAAP). Part of GAAP for local government units are the Governmental Accounting Standards Board (GASB) pronouncements. GASB Statement 34 reads as follows: "Except for the absence of a profit motive, the operating objective of business-type activities is similar to that of for-profit entities: to provide services financed fully or predominantly by fees or charges paid by service recipients (exchange revenues)."¹

NCGS 159G-20.(1) Affordability. – The relative affordability of a project for a community compared to other communities in North Carolina based on factors that shall include, at a minimum, water and sewer service rates, median household income, poverty rates, employment rates, the population of the served community, and past expenditures by the community on water infrastructure compared to that community's capacity for financing of water infrastructure improvements.

The affordability criteria methodology will be used to determine which local government units (LGU) qualify for a grant and the grant/loan mix that a system may be offered for a specific project.

¹ GASB Statement 34, Paragraph 216

III. Document Arrangement

In this document, gray boxes indicate areas in which the Division requests input from the Authority. A Glossary at the end of this document provides additional information related to the parameters discussed below.

Additionally, a spreadsheet entitled Draft Affordability Methodology for Authority has been provided for the Authority's use while reading through this information. The Introduction tab within the spreadsheet contains more information related to the spreadsheet itself.

Note that there are two separate data sets, one for water and one for sewer. This is due to the fact that, if all systems were combined into one large data set, it would be difficult to pro-rate water-only and sewer-only rates to be equivalent to the rates of combined systems.

The Division requests Authority input on the following:

- The use of two separate data sets, one for water systems, one for sewer systems.
- If the Authority wishes to combine water and sewer systems into one data set, then the Division seeks direction on how to pro-rate water-only and sewer-only system rates to be equivalent to that of combined systems.

IV. Affordability Criteria Methodology

The affordability criteria methodology consists of four tests as listed below. A LGU must pass each of the first three tests to be considered for a grant.

1. Test 1 – Population
2. Test 2 – LGU Parameters
3. Test 3 – Future Operating Ratio
4. Test 4 – Water or Sewer Rates and Debt per Connection

The following sections discuss each step in the methodology in detail.

A. Test 1 – Population

Description: This test serves as a way to determine which systems would not qualify for a grant. Systems that are greater than the proposed boundary will be eligible only for a 100 percent loan while systems less than the proposed boundary will proceed to Test 2. Note that this parameter is one of the required parameters in the affordability definition found in NCGS 159G-20.(1). A definition for population is included in the Glossary.

Boundary: The test looks only at 2013 population. Currently, the Division has set the boundary at 50,000 people. Local government units² of this size or greater (approximately 16) encompass nearly 3 million people (approximately 55 percent) of the state's population that live in LGUs.

² For the purposes of this write-up, LGU refers to local governments that are defined as Census Places by the American Community Survey (ACS). Note that these numbers presented do not incorporate populations that live in unincorporated areas of counties.

Rationale for Boundary: The Division proposes this boundary because LGUs of this size manage large systems that benefit from economies of scale and are thus able to manage their systems in an effective and efficient manner. Figures 1a and 1b show plots of water and sewer rates as compared to population and how the larger the population, the more the range of the rates narrows.

Figure 1a. Water Rates Compared to LGU Population

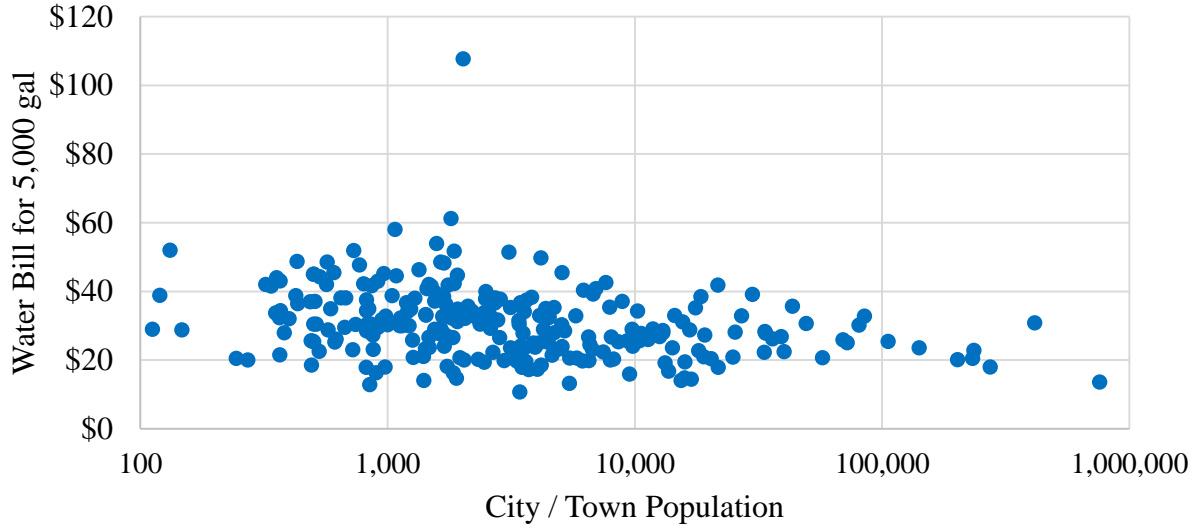
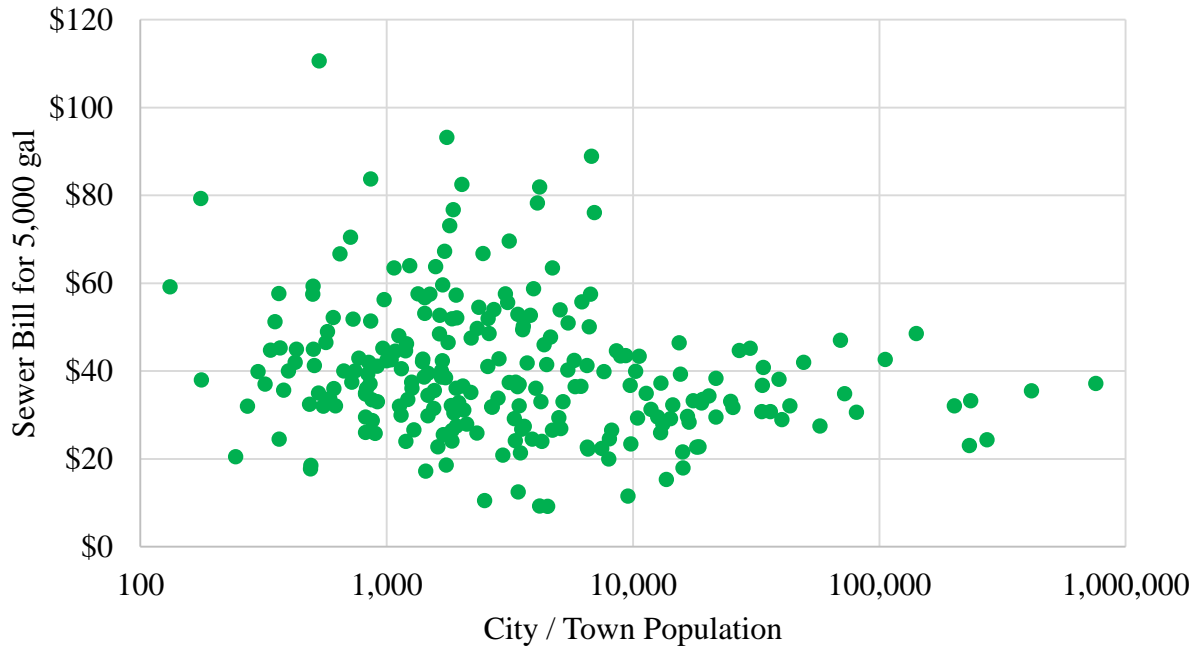


Figure 1b. Sewer Rates Compared to Population



The Division requests Authority Input on setting the boundary for Test 1 at 50,000 people.

B. Test 2 – LGU Parameters (Determination of 100 percent loan)

Description: This test serves as a way to further determine which systems would not qualify for a grant. This test examines five parameters:

- Percent change in population[†]
- Percent of population below poverty[†]
- Median household income[†]
- Unemployment[†]
- Property Valuation/Capita

[†] - parameters that are required by the affordability criteria definition found in NCGS 159G-20.(1)

The Glossary contains additional information about these parameters including information related to the data sources.

Proposed 3 Methodologies for Test 2: Overall, the Division proposes to utilize a “binning” methodology to categorize how well or poorly a system remaining after Test 1 fares within each parameter. Bins range from 1 to 6 as follows:

- Systems in Bin 1 are not doing well for that particular parameter.
- Systems in Bin 6 are doing very well for that parameter.

The Division proposes three binning methodologies for the Authority to consider for determining these bin boundaries, as described below.

- Method 1 – Equal Bin Distribution. The remaining systems after Test 1 were percentile-ranked from 1 to 100 for each parameter. The percentile-rankings were then equally divided into the six bins. Figure 2 below shows an example of how Method 1 would look on a histogram containing 72 systems. The bin scores for each of the parameters were then averaged and carried out to the tenth decimal place (see spreadsheet).

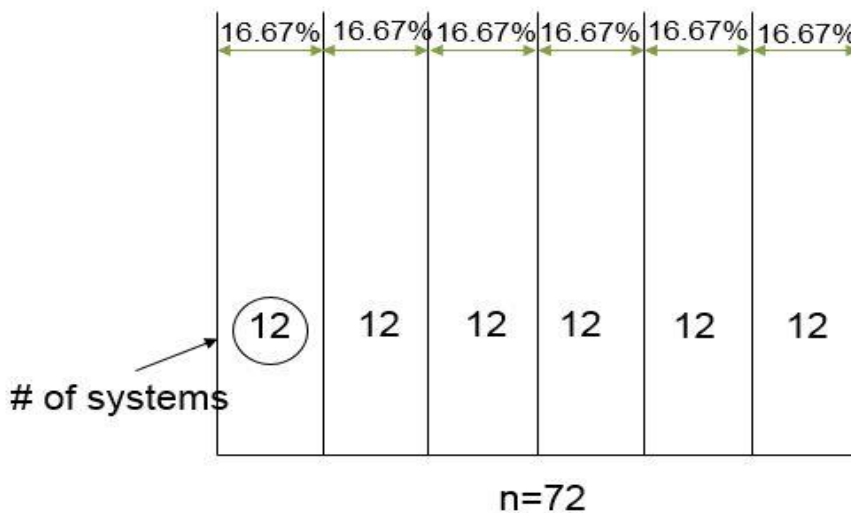


Figure 2. Example of Method 1 – Equal Bin Distribution

- Pro – Method 1 provides an equal bin widths for consideration (e.g., each bin is 16.17 percent wide).
- Con – Method 1 results in an equal distribution of systems within each bin for particular parameters. In the example, each bin has 12 systems.

----- End of Method 1 -----

➤ **Method 2 – State Median.** In this method, the state medians were used to determine the boundary of the middle bins (i.e., the boundary between Bin 3 and Bin 4). The boundaries between the other bins were set using the 10th, 25th, 75th, and 90th percentile of the LGU dataset from the ACS, which encompasses 555 LGUs. For example, as shown below, the boundaries for the upper and lower bins are set at the upper and lower 10th percentile, respectively. The boundaries for Bins 5 and 2 are set between upper and lower 10th and 25th percentile, respectively.

Bin 1	< lowest 10 th percentile rank
Bin 2	between lowest 10 th and 25 th percentile rank
Bin 3	between lowest 25 th percentile and median
Bin 4	between highest 25 th percentile and median
Bin 5	between highest 10 th and 25 th percentile rank
Bin 6	> highest 10 th percentile rank

Note that for some parameters a low percentile rank is the result of a high numeric value (e.g., a high poverty rate results in a low percentile rank). Figure 3 shows an example of how 100 systems could be distributed utilizing this methodology.

Once the LGU parameters for systems are binned as described above, their average is taken and carried out to the tenth decimal place (see spreadsheet).

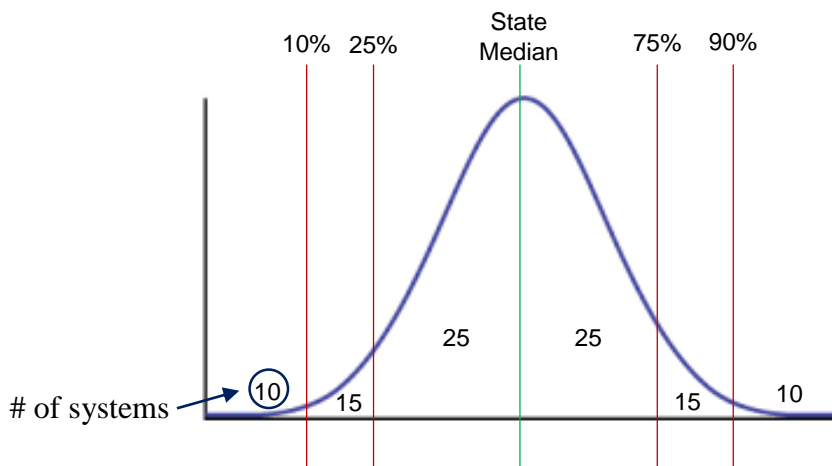


Figure 3. Example of Method 2 – State Median Distribution

- Pro – Method 2 relies on the state median, with the exception of property valuation per capita, for the demarcation between Bins 3 and 4. In other words, LGUs are compared to the state median rather than to a median of the LGU data set (555 points).
- Con – Method 2 may favor more LGUs in Bins 1 through 3 rather than 4 through 6. However, that may reflect that many small LGUs are below the state medians for these parameters.

----- End of Method 2 -----

➤ Method 3 – Equal Populations. The remaining systems after Test 1 were reviewed with the LGU parameter bin boundaries equating to roughly equal portions of population (i.e., about 200,000). The bin scores for each of the parameters were then averaged and carried out to the tenth decimal place (see spreadsheet). Tables 1 through 5 below show the boundaries for each parameter under Method 3.

Table 1. Percent Population Change						
Bin #	Drinking Water Analysis			Wastewater Analysis		
	Low Percent Population Change	High Percent Population Change	Population in bin	Low Percent Population Change	High Percent Population Change	Population in bin
1	-57%	-4%	199,799	-39%	-4%	194,981
2	-4%	0%	227,586	-4%	0%	227,578
3	0%	4%	259,158	0%	4%	256,178
4	4%	10%	248,418	4%	10%	248,062
5	10%	24%	221,592	10%	24%	208,804
6	24%	188%	173,645	24%	188%	169,606

Table 2. Poverty Rate						
Bin #	Drinking Water Analysis			Wastewater Analysis		
	Low Poverty Rate (%)	High Poverty Rate (%)	Population in bin	Low Poverty Rate (%)	High Poverty Rate (%)	Population in bin
6	0.0	10.0	176,126	0.0	10.0	166,265
5	10.0	18.0	201,280	10.0	18.0	202,501
4	18.0	23.0	234,587	18.0	23.0	222,032
3	23.0	26.0	272,285	23.0	26.0	271,783
2	26.0	30.0	219,625	26.0	30.0	222,259
1	30.0	61.0	226,295	30.0	61.0	220,369

Table 3. Median Household Income						
Bin #	Drinking Water Analysis			Wastewater Analysis		
	Low MHI	High MHI	Population in bin	Low MHI	High MHI	Population in bin
1	\$12,000	\$29,000	215,386	\$12,000	\$29,000	209,618
2	\$29,000	\$33,000	274,308	\$29,000	\$33,000	273,982
3	\$33,000	\$37,000	203,810	\$33,000	\$37,000	202,935
4	\$37,000	\$41,000	241,939	\$37,000	\$41,000	229,426
5	\$41,000	\$56,000	202,333	\$41,000	\$56,000	208,136
6	\$56,000	\$139,000	192,422	\$56,000	\$139,000	181,112

Table 4. Percent Unemployment						
Bin #	Drinking Water Analysis			Wastewater Analysis		
	Low (% Unemploy.)	High (% Unemploy.)	Population in bin	Low (% Unemploy.)	High (% Unemploy.)	Population in bin
6	4.00	5.20	195,517	4.0	5.2	180,564
5	5.20	6.00	210,506	5.2	6.0	206,677
4	6.00	6.25	204,304	6.0	6.2	177,963
3	6.25	6.50	248,961	6.2	6.4	226,133
2	6.50	7.50	243,933	6.4	7.1	245,037
1	7.50	13.00	226,977	7.1	13.0	268,835

Table 5. Property Valuation per Capita						
Bin #	Drinking Water Analysis			Wastewater Analysis		
	Low Property Valuation/ Capita	High Property Valuation/ Capita	Population in bin	Low Property Valuation/ Capita	High Property Valuation/ Capita	Population in bin
1	\$0	\$63,000	203,898	\$0	\$63,000	199,556
2	\$63,000	\$75,000	203,535	\$63,000	\$72,000	197,863
3	\$75,000	\$83,000	268,571	\$72,000	\$82,000	201,008
4	\$83,000	\$110,000	252,773	\$82,000	\$95,000	220,768
5	\$110,000	\$135,000	230,284	\$95,000	\$120,000	216,532
6	\$135,000	\$9,500,000	164,020	\$120,000	\$9,500,000	267,446

- Pro – By comparing population groups to each other rather than to systems, smaller systems with similar situations are compared collectively against the wider population base instead of against each other.
- Con – Some bins may be very narrow and some may be wide to accommodate an approximate equal population. The bin width may not be reflective of the associated margin of error of the parameter.

----- End of Method 3 -----

Boundary: For Test 2, under any of these three methods described above, the Division has set the boundary to qualify for further grant consideration as an average bin score of less than 4. Systems with an average bin score of 4 or more would only be eligible for a 100 percent loan. Systems with an average bin score of less than 4 would continue to Test 3.

Rationale for Boundary: The Division proposes the boundary between Bins 3 and 4 because it removes those systems in Bins 4, 5, and 6 that are generally better off based upon the five parameters considered. These systems would more likely be able to afford a 100 percent loan because their customers are generally located in a growing community, have lower poverty rates, have higher median household income, lower unemployment rates, and higher property valuation per capita. The systems in Bins 1, 2, and 3 are generally experiencing low population growth or population loss, high poverty, low median household income, high unemployment, and low property valuation per capita. This is a traditional view of affordability that has been maintained. For Methods 2 and 3, over 70 percent of the systems that passed Test 1 (populations < 50,000) also pass these methods for Test 2. For Method 1, just over 60 percent of the systems move forward to Test 3.

The Division requests Authority input on the following:

- Eliminating Method 1-Equal Binning from the proposed methods, as it yields the least consistent results when comparing the three methods.
- The best of the remaining methods to use to determine the bin boundaries.
- Utilizing the boundary between Bins 3 and 4 as the boundary to pass to Test 3 for the reasons discussed above in the Rationale.

----- *End of Test 2* -----

Tests 3 and 4 shift away from reviewing LGU parameters to reviewing system parameters. At its September 17, 2015 meeting, the Authority concurred with moving forward with the following system parameters: (1) days cash on hand (DCH), (2) debt service coverage ratio (DSCR), (3) operating ratio (OR), (4) rates per MHI, (5) net debt per connection, (6) debt per connection, and (7) project cost per connection.

Upon further analysis of system parameters, the Division proposes to eliminate the following parameters from additional analysis:

- Days cash on hand – The DCH data provided by the LGC provided a snapshot of the DCH at the end of the state fiscal year (June 30th) and did not provide an indication of long-term trends.
- Debt service coverage ratio – This parameter provides almost the same information as the operating ratio, only presented in a different format.
- Project cost per connection – This parameter only considered the impact of a proposed project per connection, not the overall debt per connection.

Parameters proposed for additional analysis are as follows³:

- Operating Ratio (future) – The operating ratio provides an indication of how well a system is managing its expenses and debt when compared to revenue. Additionally, the Division utilized the OR in the future condition (project included), as it provides a picture of how a project’s debt may impact the OR.
- Rates – The rates are now separated from MHI (already considered in Test 2) and are the cost to use 5,000 gallons. While the Division understands that most system connections typically use less than 5,000 gallons, it was unclear as to what other quantity would be better to use.
- Debt per connection (future) – Previously net debt per connection, the future debt per connection indicates the debt the system has per connection, including the project. Using this parameter provides information related to the debt load a system carries and how it is spread out among all connections.

Use of these three parameters for Tests 3 and 4 fulfills the requirement to consider water and sewer rates as well as past expenditures and comparison as required by the affordability definition in NCGS 159G-20.(1). The project costs used in the analysis is a hypothetical \$1 million project that the Division felt was representative of an average rehabilitation project for a smaller LGU. In application, the actual project cost from the funding application would be used.

The Division requests input from the Authority on the following:

- Confirmation to continue using the three parameters listed above in the affordability criteria analysis.
- Any additional input for any other parameters that should be used.

C. Test 3 – Future Operating Ratio

Description: In this test, the future operating ratio (OR) is considered for systems. The future OR not only considers revenues, expenses, and current debt load but also the impact of the debt service for the project on the OR. Systems that do not pass this test will only be eligible for a 100 percent loan while systems that do pass this test will continue to Test 4.

Boundary: The Division recommends a future OR boundary for the test of 1.25 for both drinking water and wastewater systems. Approximately 20 percent of all of the systems in the data set are above the 1.25 OR boundary.

Rationale for boundary: Hypothetically, any system with an OR greater than one after the project’s debt service is considered should be able to take on a loan for the entire project (i.e., no grant needed). However, a projected OR of less than 1.25 may leave a utility vulnerable to

³ Additional definitions, including equations, are provided in the Glossary.

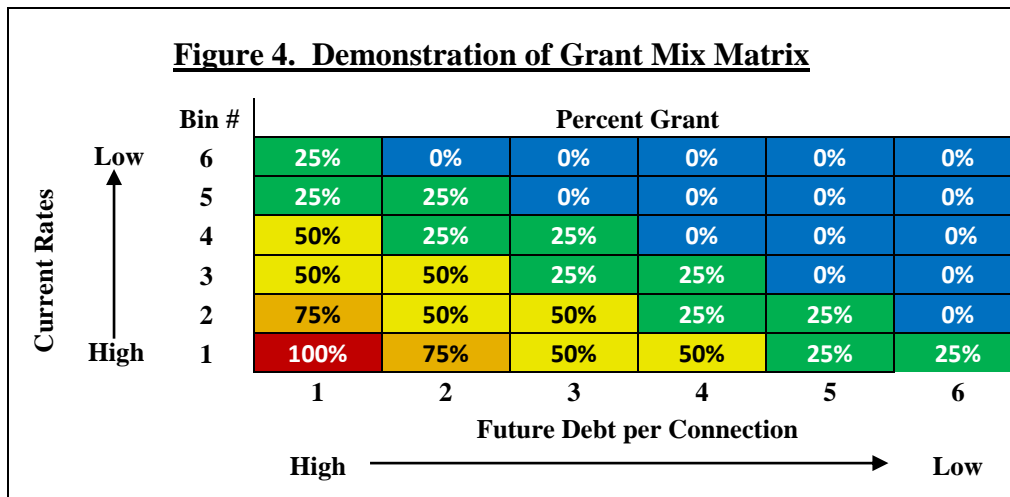
unforeseen increases in expenses or declines in revenue. Division staff believe that any system with a future OR greater than 1.25 will be able to take additional debt without it impacting their ability to maintain the financial viability.

- Pro – Tests whether a system can afford a project without impacting fiscal stability of the utility.
- Con – A future OR of 1.25 may unintentionally result in systems keeping their OR high as well as capital reserve funds low in order to pass Test 3.

The Division requests Authority input on the consideration of a future OR boundary of 1.25 for both drinking water and wastewater systems.

D. Test 4 – Rates and future debt per connection (Determination of grant/loan mix)

Description: In this final test, rates and future debt per connection are considered. As mentioned earlier, water systems and sewer systems are reviewed separately. Bins are used to place systems into a matrix that will determine their grant/loan mix (see Figure 4). The various mixes are based upon the definitive boundaries of bins and are as follows: (1) 100 percent grant, (2) 75 percent grant/25 percent loan, (3) 50 percent grant/50 percent loan, (4) 25 percent grant/75 percent loan, and (5) 100 percent loan. Once the bins are determined for both rates and future debt per connection, they are laid out on a grid with divisions that are shown below.



For the purposes of this analysis, current rates are used, as it is difficult to predict future rates since a number of factors play into determining a future rate. Future debt per connection was used because it gives an indication of the debt load, including the project, a system faces on a per connection basis. The grant/loan mix is based strictly on the affordability of that project relative to the system’s water or sewer rate and future debt per connection.

Boundaries: Both rates and future debt per connection were divided into bins based on definitive boundaries that were determined by dividing up systems with populations under 50,000 (e.g., those that passed Test 1) so that the populations are roughly the same. Using these boundaries (similar to Test 2, Method 3), the systems that passed Test 3 are run through the matrix and divided out. The boundaries are shown in Tables 6 and 7 for water and sewer systems.

Bin #	Water System Analysis			Sewer System Analysis		
	Low Water Rates	High Water Rates	Population in bin	Low Water Rates	High Water Rates	Population in bin
6	\$0	\$20	184,822	\$0	\$27	223,301
5	\$20	\$24	264,096	\$27	\$31	237,476
4	\$24	\$28	272,803	\$31	\$34	210,842
3	\$28	\$32	229,858	\$34	\$39	200,663
2	\$32	\$38	218,769	\$39	\$44	193,985
1	\$38	\$110	159,850	\$44	\$111	238,942

Bin #	Water System Analysis			Sewer System Analysis		
	Low Future Debt/ Connection	High Future Debt/ Connection	Population in bin	Low Future Debt/ Connection	High Future Debt/ Connection	Population in bin
6	\$0	\$15	191,545	\$0	\$30	205,742
5	\$15	\$30	196,601	\$30	\$75	199,248
4	\$30	\$60	258,825	\$75	\$125	258,021
3	\$60	\$100	266,718	\$125	\$175	217,418
2	\$100	\$140	184,722	\$175	\$275	221,274
1	\$140	\$2,501	231,787	\$275	\$3,850	203,506

Rationale for boundaries: The boundaries are set such that roughly equal amounts of population for LGUs under 50,000 are shown within each bin.

- Pros
 - Using only populations of less than 50,000 in the setting of the boundaries ensures a more equal distribution of populations among bins.
 - Using approximately equal populations allows for a somewhat even distribution of bins across the remaining systems.
- Con – Setting bin boundaries based upon population may create artificially narrow bins.

The Division requests Authority input on either adopting bin boundaries similar to the method chosen for Test 2, Method 3 or adopting boundaries that reflect a particular grant percent for specific rate / debt levels.

V. Preliminary Results

Based upon Tests 1 through 4, three matrices were generated, each corresponding to the method used in Test 2 – LGU Parameters. Figures 5, 6, and 7 show the preliminary results for wastewater. The numbers within the matrices indicate the number of systems that would be offered a particular grant/loan mix as shown in Figure 4 above. In total, with the proposed boundaries 129 of the original 242 wastewater systems (53.3 percent) made it to Test 4. The drinking water matrices are similar and is included in the spreadsheet.

Figure 5. Preliminary Results of Test 4 Based upon Test 2 – Method 1 (Equal Bins)

Current Rates	Bin #		Future Debt per Connection					
	Bin #		1	2	3	4	5	6
\$0 to \$27	6		3	3	0	6	7	2
\$27 to \$31	5		2	4	1	1	1	1
\$31 to \$34	4		1	5	2	3	4	1
\$34 to \$39	3		2	4	4	3	4	0
\$39 to \$44	2		7	5	5	1	3	0
\$44 to \$111	1		18	11	5	5	4	0
			\$3,850 to \$275	\$275 to \$175	\$175 to \$125	\$125 to \$75	\$75 to \$30	\$30 to \$0

Figure 6. Preliminary Results of Test 4 Based upon Test 2 – Method 2 (State Median)

Current Rates	Bin #		Future Debt per Connection					
	Bin #		1	2	3	4	5	6
\$0 to \$27	6		4	3	0	7	9	2
\$27 to \$31	5		2	4	1	3	1	1
\$31 to \$34	4		3	5	2	3	5	1
\$34 to \$39	3		3	4	5	5	4	0
\$39 to \$44	2		7	6	7	1	3	0
\$44 to \$111	1		21	12	7	6	4	1
			\$3,850 to \$275	\$275 to \$175	\$175 to \$125	\$125 to \$75	\$75 to \$30	\$30 to \$0

**Figure 7. Preliminary Results of Test 4 Based on Test 2 – Method 3
(Equal Populations)**

Current Rates	Bin #	Future Debt per Connection					
		1	2	3	4	5	6
\$0 to \$27	6	4	3	0	7	7	2
\$27 to \$31	5	2	4	1	2	1	1
\$31 to \$34	4	2	5	2	3	5	1
\$34 to \$39	3	3	4	5	5	4	0
\$39 to \$44	2	7	6	7	1	3	0
\$44 to \$111	1	20	12	7	5	4	1
		\$3,850 to \$275	\$275 to \$175	\$175 to \$125	\$125 to \$75	\$75 to \$30	\$30 to \$0

VI. Summary of Requests for Authority Input

The Division requests Authority input on the following:

- a) The use of two separate data sets, one for water systems, one for sewer systems. Alternatively, the data sets could be combined; however, water-only and sewer-only system rates would need to be equated to each other and to combined systems.
- b) Test 1 – Setting the boundary for Test 1 50,000 people.
- c) Test 2:
 - 1. Eliminating Method 1 – Equal Binning from the proposed methods, as it yields the least consistent results when comparing the three methods.
 - 2. Determining the best of the remaining methods (i.e., Method 2 or Method 3) to use to determine the bin boundaries.
 - 3. Utilizing the boundary between Bins 3 and 4 as the boundary to pass to Test 3 (regardless of method chosen).
- d) Confirmation to continue using current rates, future operating ratio, and future debt per connection in the affordability criteria analysis.
- e) Test 3 – The consideration of a future OR boundary of 1.25 for both drinking water and wastewater systems.
- f) Test 4 – The adoption of bin boundaries similar to the method chosen for Test 2, Method 3 or adopting other boundaries to determine a particular grant percent for specific rate / debt levels.
- g) Any additional input for any other system parameters that should be used.

Glossary

Debt per connection – The debt load a system carries as shown in terms of the debt load for each connection. Connections include residential, institutional, commercial, industrial, and bulk connections.

Operating Ratio (future) – The ability of a system to cover its day-to-day expenditures, including debt.

$$OR_{Future} = \frac{Operating\ Revenue}{\left(Operating\ Expenses + Debt\ Service + \left(\frac{Project\ Cost}{20} \right) \right)}$$

Population – The amount of people in a geographic area. **Source:** 2013 5-year estimates from the American Community Survey (ACS). The ACS utilizes pure population derived from the decennial census, the most recent one being 2010. For each year, the Census Bureau adds in births and incoming immigration and subtracts out deaths and outgoing emigration. As a result, the ACS uses this number for population.

Population Change – The change in population over a period of time. For the purposes of this analysis, the range of 2009 to 2013 was used, as 5-year estimates in ACS data are not available for years before 2008. For the purposes of this analysis, population changes were normalized into percent population change. **Source:** American Community Survey. Changes in population were calculated as a percentage to normalize the data.

Poverty Rate – The percentage of people who lived in poverty for a calendar year. Poverty rate is based upon the poverty threshold. The poverty threshold varies by family size but does not vary geographically. Updated for inflation. **Source:** American Community Survey. Data for this parameter were obtained by the ACS through surveys.

Median Household Income – Money received on a regular basis. Includes the income of the householder and all other individuals 15 years or over in the household. **Source:** American Community Survey. Data for this parameter were obtained by the ACS through surveys.

Unemployment – The number of unemployed civilians shown as a percentage that fit the following: (1) who were neither “at work” nor “with a job but not at work”; (2) were actively looking for work during the last 4 weeks, and (3) were available to start a job). **Source:** North Carolina Department of Commerce Employment Security Commission. Data for this parameter are obtained via unemployment filings citizens make when they file for unemployment benefits.

Property Valuation per capita – The worth of a LGU’s tax base on a per person basis. **Source:** North Carolina Local Government Commission (LGC). Data for this parameter are obtained by the LGC via filings from LGUs.

State Water Infrastructure Authority
Meeting Date – December 10, 2015
Agenda Item K – Asset Inventory and Assessment Grant

Division of Water Infrastructure Staff Report

Background

North Carolina General Statute G.S. 159G-71 contains the powers and the duties of the State Water Infrastructure Authority (Authority) which includes the following:

- Review application of management practices in wastewater, drinking water & stormwater and to determine best practices

In addition, the General Assembly approved broadening the use of grant funds for proactive activities including for a utility to inventory and assess its water and/or sewer infrastructure. At the Authority's Sept. 2015 meeting, Division staff presented information about proposed goals for the asset inventory and assessment grants and proposed deliverables which were supported by the Authority, as follows:

Asset Inventory and Assessment Goals

- The primary goal of the new grants is to assist utilities in beginning an asset management program to help them move from reactive to proactive work strategies; to better develop capital, operating, and life cycle costs; and to meet the demand to do more with existing resources.
- The secondary goal is to enable utilities to apply to the Division funding programs with capital improvement projects that meet the most critical needs of the system, as determined by a structured asset management approach.

Project Deliverables

- A. Inventory
- B. Critical Asset Analysis
- C. Condition Assessment
- D. Cost Development
- E. Project Identification
- F. Project Prioritization
- G. Capital Improvement Plan

It is anticipated that the Authority will provide final approval of the asset inventory and assessment grants program at its meeting on January 21, 2016, and the program will be available for the March 2016 application funding round.

Overview

Division staff developed grant application components and project deliverables which are presented in this document for the Authority's review.

Staff Recommendations

Staff recommends that the Authority approve the staff to solicit public comment on the proposed grant application components and project deliverables.

(This page intentionally left blank)

Proposed Asset Inventory and Assessment Grants Program

Part I. Grant Application Components

The grant application will consist of:

- A. Narrative
- B. Asset Management Questionnaire
- C. Priority Rating System

A. Narrative

1. Describe the benefit to the local government of receiving an Asset Inventory & Assessment grant.
2. Identify (by title or employee job description) the utility's internal asset management team that will be assembled to help develop the asset inventory and assessment project. This team will be heavily involved in the project. Properly documented in-kind services by these employees can be used toward match requirements.
3. Provide a cost estimate to prepare each of the Project Deliverables:
 - Inventory
 - Critical Asset Analysis
 - Condition Assessment
 - Cost Development
 - Project Identification
 - Project Prioritization
 - Capital Improvement Plan
4. Provide a list and description of expenditures for collection/distribution/treatment maintenance activities performed over the last 3 years.
5. Provide budgeted versus actual expenditures for capital and maintenance for water and sewer items for the previous year.
6. Provide a copy of any existing asset inventory and map if any work has been done previously.

B. Asset Management Questionnaire

Section 1: General Asset Management

- a. How are asset management concepts understood throughout the organization?
- b. Does the organization have an Asset Management Plan for water and/or sewer? If yes, describe the plan. If no, explain why not.
- c. How is asset management fully embraced by the elected officials or governing body of the organization?
- d. How does the organization communicate an asset management strategy throughout the organization?

Section 2: Current State of the Assets

- a. Describe the inventory if the organization has an asset inventory or partial inventory.
- b. Does the organization have a map of asset locations? How accurate is the map?
- c. Describe the organization's process for condition assessment.
- d. How does the organization estimate useful life of infrastructure assets?
- e. How does the organization determine asset replacement values?

Section 3: Assets Critical to Sustained Performance

- a. How does the organization currently assess the likelihood of failure of assets?
- b. How does the organization currently assess the consequence of asset failure?
- c. Describe the organization's current process to rank assets according to the likelihood and consequences of asset failure (i.e. according to "overall risk").
- d. How does the likelihood and consequences of asset failure (i.e. the "overall risk") drive capital improvement decisions?
- e. How does overall risk drive asset operation and maintenance (O&M) decisions?

Section 4: Life Cycle Cost

- a. How will the organization discuss life cycle costs with the governing board?
- b. How does the organization make capital infrastructure investment decisions?
- c. What determines which projects get included in a Capital Improvement Plan (CIP)?
- d. How often does the organization update its CIP?
- e. Does the organization have a program to analyze the use of operation and maintenance processes to extend the life of the existing assets? If yes, describe the plan. If no, explain why not.

Section 5: Financing

- a. Does the organization maintain reserve funds/accounts?
- b. Does the organization target its rates and other revenue streams to adequately fund a viable system? If not, how does the organization determine its rates?
 - A viable system is defined as one that functions as a business enterprise, establishes organizational excellence, and provides appropriate levels of infrastructure maintenance, operation, and reinvestment – including reserves for unexpected events – that allows the utility to provide reliable water services now and in the future.
- c. Describe the organization's plan to fund capital improvements for the long term.

C. Priority Rating System

Priority points are proposed to be assigned as follows:

Line Item #	Asset Inventory and Assessment Priority Rating System	Points	Points Claimed
1	Complete Asset Management Questionnaire: 50 points for complete responses to all questions; 25 points for responses to most questions		
1.A.	Complete responses to all questions OR	50	
1.B.	Responses to most questions	25	
2	Majority of treatment units, pumps and/or pump stations in system are greater than 20 years old OR lines, storage tanks, drinking water wells and intake structures are greater than 40 years old	20	
3	Affordability Criteria points (calculated)	X	
	Total Points		

Part II. Project Deliverable Components

The project deliverables will consist of:

- A. Inventory
- B. Critical Asset Analysis
- C. Condition Assessment
- D. Cost Development
- E. Project Identification
- F. Project Prioritization
- G. Capital Improvement Plan

Note that the utility's internal asset management team will be heavily involved in all aspects of the deliverables.

A. Inventory

1. The inventory must answer these questions:
 - a. What does the utility own?
 - b. Where is it?
 - c. What condition is it in based on current knowledge?
 - d. What is its useful life?
2. Submit a completed Asset Inventory spreadsheet which includes for each asset:
 - Identification number
 - Name of asset
 - Category (valves, hydrants, piping, manholes, etc.)
 - Size and material of piping
 - Location with street or other location identifier
 - Installation year if known
 - Useful life (from EPA tables – links to be provided or other available sources such as manufacturers' data)
 - Known condition based on best information available (i.e. without additional data collection); use rating system of:
 - 1 = Very Good, only normal maintenance required
 - 2 = Good, minor maintenance required
 - 3 = Fair, significant maintenance required
 - 4 = Poor, renewal/upgrade required
 - 5 = Very Poor, over 50% of asset requires replacement
3. Provide a map of the assets with the locations accurate to within one meter with the North Carolina Board of Examiners for Engineers and Surveyors (NCBELS) approved disclaimer. *(Note that staff will develop this statement in conjunction with NCBELS).*

B. Critical Asset Analysis

1. The critical asset analysis must consider the following:
 - a. How do assets fail?
 - b. What are the probabilities and consequences of asset failure?
 - c. What does it cost to repair the asset?
 - d. What are the other costs such as environmental, legal, etc. that are associated with asset failure?
 - e. Which assets are most critical to meet the health and safety needs of the system?

2. Submit a completed Critical Asset Analysis spreadsheet which includes the assets that are likely to fail and have a significant consequence if they do fail. Evaluation components include:
 - Remaining useful life
 - Service history/likelihood of failure based on consideration of asset age, condition, failure history, historical knowledge, general experiences with the asset, and knowledge of how the asset is likely to fail; use rating system ranging from 1 to 5 with:
 - 1 = least likely to fail
 - 5 = most likely to fail
 - Consequence or importance of failure based on consideration of cost of repair, costs related to the loss of the asset (such as impacts to businesses if they lose water/sewer), repair/ replacement costs related to collateral damage caused by the failure, legal costs related to additional damage caused by failure, environmental costs related to the failure, and any other potential costs associated with failure or loss of asset; use rating system ranging from 1 to 5 with:
 - 1 = fewest consequences
 - 5 = most consequences
 - Redundancy including a description of the redundancy of each asset based on consideration of whether there are there assets that can do the same job even if they cannot do it as well; use % redundancy as follow:
 - 0% = no backup asset available
 - 50% = backup provides half of asset capability
 - 100% = backup provides all of the asset capability
 - 200% = backup provides double the asset capability
 - Evaluate risk by considering the likelihood of failure, consequence of failure and redundancy; then assign priority value to asset based on risk; use rating system ranging from 1 to 5 with:
 - 1 = very low risk
 - 2 = low risk
 - 3 = moderate risk
 - 4 = high risk
 - 5 = very high risk
 - Assign priority value to asset based on risk with 1 being the highest priority (most critical asset).

C. Condition Assessment

1. Perform field verification of the condition of the highest priority critical assets – must include visual inspection of all above ground equipment and structures and opening manholes on sewer lines, can include dropping a camera in manholes to view sewer lines, smoke testing, CCTV inspection of sewer lines, infiltration/inflow evaluations, operating water valves, inspecting water storage tanks, applying leak detection technologies, vibration and temperature analysis of equipment, etc.
2. Submit a report describing the field assessments performed and the conditions discovered for the critical assets.
3. Re-evaluate risk and re-prioritize assets as needed based on condition assessments performed.

D. Cost Development

There are four options to be considered for managing assets over time:

- Operate and maintain the existing assets
- Repair the assets as they fail
- Rehabilitate the assets
- Replace the assets

These options are very connected to each other. Choosing to do more or less of one option impacts how much of the others is done, whether or not the other is done at all, or the time frame in which one of the others is done. For example, choosing to spend more on operating and maintaining assets will decrease the need to repair the asset and will increase the amount of time until the asset is replaced. Choosing to rehabilitate an asset will eliminate the need to replace the asset in the short term and will increase the amount of time until the asset ultimately will need to be replaced. Rehabilitation will also reduce the amount of operation and maintenance that needs to be done and reduce the need for repairs.

1. Consider which of the four options is best for each critical asset. Assets with low likelihood and low consequence of failure should have lower expenditures on O&M and less investment in condition assessment, while assets with high likelihood and high consequence should have much more expenditure on O&M and more investment in condition assessment.
2. Assign life cycle costs associated with the chosen option (O&M, repair, rehabilitation, or replacement plus continuing condition assessment) for each critical asset.

E. Project Identification

1. From the list of critical assets, identify the assets requiring significant rehabilitation or replacement in the next 10 years.
2. Develop individual projects or groups of projects by combining or subdividing asset capital needs by considering assets reaching end of useful life at the same time, geographic proximity, etc.
3. Provide the associated capital costs for each project including engineering, permits, construction, etc.

F. Project Prioritization

1. Submit a completed Project Prioritization spreadsheet which includes:
 - Year project needed
 - Project name
 - Description of the project
 - Brief statement regarding the need for the project
 - Is the year needed flexible or absolute?
 - Estimate of project costs including engineering, permits, construction, etc.
 - Potential funding sources available for this type of project
 - Changes in overall operations that may occur as a result of the project including operator requirements, additional O&M costs, any efficiencies that may be gained, etc.
2. Rank the projects based on asset criticality and year project is needed; use ranking system of:
 - 1 = highest priority
 - 5 = lowest priority

G. Capital Improvement Plan

1. Develop a Capital Improvement Plan (CIP) to cover the utility's needs for the future. The planning period must be at least 10 years and must include capital costs for 10 years. The types of questions to examine when performing the annual review of the CIP include the following:
 - Is the reason/need for the project still valid?
 - Have the costs changed since originally projected?
 - Is there a better approach or a better technology that can be used to address the need?
 - Can the project be safely delayed?
 - Does the project need to be completed sooner?
 - Is there a method of rehabilitation that could be used rather than replacement to save costs?
 - Will funding be available for this project?
 2. The utility's governing board must adopt the CIP with approved documentation of adoption.
 3. Submit copies of the:
 - Adopted CIP.
 - Approved documentation of adoption of the CIP.
 - Adopted statement that the CIP will be reviewed and updated on an annual basis to determine if all of the listed projects are indeed necessary.
 - The annual review must include considerations such as whether projects can be safely pushed back for several years or may not be needed due to changing conditions. Since the projects are planned several years in advance, conditions may have changed, eliminating or reducing the need for an identified project. Alternatively, some projects may now need to be addressed sooner than anticipated, and the CIP will need to be adjusted accordingly.
-

Deliverable Item A. Asset Inventory Spreadsheet

ID #	Asset	Category	Size/Material	Location	Year Installed	Useful Life	Condition
	SEE LIST ON PAGE 12 FOR EXAMPLES	Valves, hydrants, piping, manholes, etc.	Piping	Street or other location identifier	If known	Useful life (from EPA tables – links to be provided or other available sources such as manufacturers’ data)	<p>Known condition based on best information available (i.e. without additional data collection); use rating system of:</p> <ul style="list-style-type: none"> ○ 1 = Very Good, only normal maintenance required ○ 2 = Good, minor maintenance required ○ 3 = Fair, significant maintenance required ○ 4 = Poor, renewal/upgrade required ○ 5 = Very Poor, over 50% of asset requires replacement

Deliverable Item B. Critical Asset Analysis Spreadsheet

ID #	Asset	Category	Remaining Useful Life	Service History/ Likelihood of Failure	Consequence/ Importance of Failure	Redundancy	Risk	Priority (1 is highest priority)
				<p>Consider asset age, condition, failure history, historical knowledge, general experiences with the asset, and knowledge of how the asset is likely to fail; use rating system ranging from 1 to 5 with:</p> <ul style="list-style-type: none"> ○ 1 = least likely to fail ○ 5 = most likely to fail 	<p>Consider cost of repair, costs related to the loss of the asset (such as impacts to businesses if they lose water/sewer), repair/ replacement costs related to collateral damage caused by the failure, legal costs related to additional damage caused by failure, environmental costs related to the failure, and any other potential costs associated with failure or loss of asset; use rating system ranging from 1 to 5 with:</p> <ul style="list-style-type: none"> ○ 1 = fewest consequences ○ 5 = most consequences 	<p>Consider whether there are there assets that can do the same job even if they cannot do it as well; use % redundancy as follows:</p> <ul style="list-style-type: none"> ○ 0% = no backup asset available ○ 50% = backup provides half of asset capability ○ 100% = backup provides all of the asset capability ○ 200% = backup provides double the asset capability 	<p>Consider likelihood of failure, consequence of failure and redundancy; use rating system ranging from 1 to 5 with:</p> <ul style="list-style-type: none"> ○ 1 = very low risk ○ 2 = low risk ○ 3 = moderate risk ○ 4 = high risk ○ 5 = very high risk 	<p>Assign priority value to asset based on risk</p>

Deliverable Item F. Project Prioritization Spreadsheet

Year Needed	Project Name	Project Description	Project Need	Is Year Needed Flexible? (Y or N)	Estimated Project Cost	Potential Funding Sources	Changes in Operation	Project Rank (1 is highest priority)
					<p>Include engineering, permits, construction, etc.</p> <p>Cost estimates must be adjusted for timing of project (year needed) since they will cost more in the future than today. Adjust using Engineering News Record (ENR) Construction Cost Index (CCI) or similar index.</p>		<p>Consider changes in overall operations that may occur as a result of the project including operator requirements, additional O&M costs, any efficiencies that may be gained, etc.</p>	<p>Assign project priority</p>

**Examples of Asset Inventory Components
for Deliverable Item A. Asset Inventory Spreadsheet**

Drinking Water System Asset Inventory				
1. Source/Supply				
Groundwater	Wells	Pumps		
Surface Water	Raw water intake structure	Raw water pump station: Structure; Pumps; Motor control center	Raw water mains	Dams/impoundments
2. Water Storage	Tank	Booster pump station	Backflow preventer	
3. Water Distribution	Pipe: Diameter Material Approx. age	Valves: Pressure Reducing Air release Isolation	Hydrants	Master meters
Wastewater Collection System Asset Inventory				
1. Pump Station	Pumps	Motor control center	Generator	
2. Force Main	Pipe: Diameter Material Approx. age	Air release valves	Meters	
3. Gravity Sewer	Pipe: Diameter Material Approx. age	Manholes: Diameter Depth Material Incoming/outgoing pipe size		
Water Treatment Plant / Wastewater Treatment Plant Asset Inventory				
1. Buildings	Size	Function		
2. Liquid Train Units				
Major Mech. Equip. Examples	Pumps	Compressors/blowers	Mixers	Filters
	Horsepower; Gallons per minute/cubic feet per minute; Approx. age			
Structures	Size	Function		
3. Solids Train Units				
Major Mech. Equip. Examples	Pumps	Compressors/blowers	Mixers	Valves
	Horsepower; Gallons per minute/cubic feet per minute; Approx. age			
Structures	Size	Function		
4. Chemical Feed	Chemical used	Feed system/pumps	Storage	
5. Major Yard Piping				
6. Electrical Equipment	Generators	Motor control centers		
7. SCADA/Controls				