

CFWI Regulatory Team Discussion Document – Uniform Demand Calculation by Use Class (Utility)

This document includes the necessary elements for revision of current District rules to develop a consistent methodology for current population and per capita estimates and future population and water demand projections. This methodology and prescribed alternatives may be used for compliance and/or planning purposes in the Central Florida Water Initiative (CFWI) and its Regional Water Supply Plan (RWSP). The intention is not to supersede rules established for the purpose of determining compliance within existing areas of critical concern or water use caution areas of the CFWI, such as the Southern Water Use Caution Area (SWUCA) of the Southwest Florida Water Management District.

A. Elements of Demand Calculation for Utility/Public Supply >100,000 gallons per day :

The general formula for calculating projected water demand is the multiplication of a historic average per capita water use times a projected service area population. For the methods being contemplated, several key components must be developed:

- **Historic annual gross per capita water use** based on a gross water use and an estimate of same year service area population – whether that population is permanent, functional or some combination of both (such as served dwelling units times an estimated persons per household).
- **Base year service area population** is the population is to be increased by growth rate based on utility historic data or derived from other projections, such as county or parcel-level BEBR;
- **Projected service area (future) population** (not a growth rate) whether derived from historic utility population data or county or parcel level BEBR projections.

Possible options for developing these components for permitting/regulatory demand projections are addressed below.

1. Historic Demand = Historic Population X 5-year Average Gross Per Capita

It is recommended that this information be collected annually. Included elements of an annual report would be Annual Gross Water Use, Annual Population, Annual Uniform Gross Per Capita, and if necessary by existing or other proposed rules, Uniform Residential or Compliance Per Capita values.

- a. **Historic Annual Gross Water Use** - Gross water use encompasses the water withdrawn and supplied to the customers of the water utility (residential, commercial, irrigation, etc) defined as annual average gallons per day of potable water and stormwater used for year of interest. Calculated as
Historic Annual Gross Water Use = Withdrawals + Imports – Exports – Treatment Loss

To develop gross water use, the following data must be provided by the utility or estimated by the appropriate district:

- **Withdrawals:** Annual average gallons per day of permitted sources (e.g. ground water, surface water and stormwater withdrawals) as metered at the wellhead(s), wellfield's departure point, or surface/storm water intake. As reclaimed water is not a permitted source, it is not included here.
- **Imported Water:** Annual average water imported or purchased from other supplier(s). Irrigation water, excluding reclaimed water, provided to the applicant's service area by a separate utility shall be counted as imported water. Imported water shall be determined at the departure point from the supplier's (e.g., based on seller's invoice).
- **Exported Water:** Annual average gallons per day of water transferred in bulk quantities from your utility to other water suppliers. Determine quantities at the departure point from your service area (e.g., based on seller's invoice).
- **Water Treatment Loss:** Annual average gallons per day which are lost in routine treatment for its intended use (e.g., potable water for drinking or stormwater for irrigation). Examples of treatment loss types are desalination reject, membrane cleaning, lime softening treatment loss and sand

filtration backwash. Treatment losses are calculated as raw water into the plant minus treated water out of the plant.

- **Metered "Finished" Water:** Treated water out of the plant and measured by a meter at the point of entry to the distribution system.
- b. **Historic Population** is required for calculation of per capita water use for a given year and for the calculation of an historic average per capita water use to be used in projecting public supply water demand. The methodology described in (1) below will be utilized for/as a *uniform permitting base method*, but may be modified based on demonstration of appropriate circumstances to warrant an alternative method as described below in (2-4).

- 1) Historic Uniform Base Method for Utility Service Area Residential Population: Total residential dwelling units served) multiplied by the census-based persons per household for the county (or utility, if available). *Note: The methodology does not include the group quarters portion of permanent population.*

Utility service Area Residential Population is based upon **total** historic year residential dwelling units, which include Single Family Residential, Multi-Family Residential (apartments, townhomes, condos, duplexes) and Mobile Homes, [as an annual average for a select calendar year].

Served dwelling units can be reported by utilities from their billing data on an annual basis or estimated by the districts from GIS parcel layers (e.g. Property Appraiser data) overlain by utility service area boundaries and adjusted where possible to exclude areas known to be domestic self-supplied. This latter effort assumes that the utility can provide their service area boundaries and the location and type of service lines available for public supply. The annual collection and reporting of served single family and total residential units by utilities is recommended.

- 2) Alternative method: Use GIS-parcel layer that has permanent population included by county-level or utility service area level delineation for that year. The collection and reporting of served single family and total dwelling units by utilities is recommended here as well to serve as another means of controlling for domestic self-supply in a service area where domestic self-supply areas cannot be easily delineated for exclusion.
- 3) *SWUCA Compliance method: SWFWMD has developed a process for calculating Total Functional Population, which is defined as "the served permanent population as adjusted by the seasonal resident, tourist, group quarters and net commuter population within a utility's service area. This is calculated primarily based on the dwelling units served by the utility." With the assistance of population cohorts per utility developed and provided by the District, the utility would select the appropriate service area and provide the number of total residential dwelling units served. The population cohort data is derived from methodologies developed by the SWFWMD using decennial Census, State of Florida AHCA, State of Florida DBPR, Census ACS, and purchased lodging data. The data is not provided by BEBR or GIS Assoc. However, BEBR has indicated that it would be able to provide annual estimates and projections of permanent population if their proposed parcel based methodology were adopted. The reason that the SWFWMD calculates and projects functional population is to create a more level playing field among utilities that must comply with the 150-gpcd requirement that applies to all utilities. In the absence of a single maximum per capita standard that applies across utilities, permanent population*

estimates for per capita calculations and permanent population projections would provide suitable results for projecting service area demand.

- 4) *Public Supply entities that provide water supply for predominately commercial uses and transient populations are excluded from these calculations and will be evaluated on a case-by-case basis.*

2. Historic Per Capita Water Use

- a. The **Uniform Annual Gross Per Capita** is the total or gross historic annual service area water use for a given year to be divided by the estimated service area population for the same year (calendar year of interest, e.g., 2014). Historic annual gross per capita is used in the development of public supply projections. It is defined by the 2008 FDEP Guidance Memo and shall be used in the historic demand estimation and the projection methodology. It is defined as:

$$\frac{\text{Utility Service Area Finished Water Use}}{\text{Utility Service Area Residential Population}}$$

Utility Service Area Finished Water Use is defined as withdrawals + imports – exports – treatment losses and the water use includes the water use of all sectors (residential, industrial, commercial, etc.) served by a utility.

Again, Utility Service Area Residential Population is based upon **total** residential dwelling units **served**, which include Single Family Residential, Multi-Family Residential (apartments, townhomes, condos, duplexes) and Mobile Homes, multiplied by an estimate of persons per household. It is recommended to estimate the base-year served population using a service area-specific growth rate when it is known that non-residents occupy a significant portion of served dwelling units, unless both the historic and projected served populations are functionalized. Service area-specific growth rates applied to base-year served residential population is also recommended when there is a significant domestic self-supply population within the service area which has not or cannot be isolated and removed.

- 1) As a base permitting method, a 5-year average of the Uniform Annual Gross Per Capita is recommended.
- 2) An alternative method of using a 10-year average of the Uniform Annual Gross Per Capita may be approved provided the Permittee can demonstrate that there has been a dramatic, rapid change in weather or climatic factors affecting precipitation patterns (either up or down) in the most recent 5 years that would render a 5-year average not representative for projecting the next 20 years.
- 3) An alternative method for areas where there are a large number of dwelling units occupied by non-residents that are not included in the BEBR projections can be considered on a case by case basis. A recommended method would be to apply utility-level growth rates.

- b. **Uniform Residential Per Capita** is defined by the 2008 FDEP Guidance Memo as

$$\frac{\text{Utility Service Area Finished Water Use by Dwelling Units (or Total Residential Water Use)}}{\text{Utility Service Area Residential Population}}$$

Where:

- **Utility Service Area Finished Water Use by Dwelling Units** is the sum of finished water used by all dwelling units served by a utility.

Commented [JY1]: Our major concern is that a per capita that is calculated using a per capita that may include a lot of DUs occupied by populations not in the BEBR projections could cause the per capita for some service areas to be too low and then when multiplied times only permanent population projections will cause the demand projections to be too low. Such a service area is NERUSA.

I'm not sure this is the appropriate place for this as this is addressing the growth rate to be used which has more to do with projections than per capita. We should likely discuss this more as to its appropriate placement. The real issue with the uniform per capita is that it includes population based on dwelling units which may include seasonal and short term residents that are not in the BEBR permanent projections. The solutions to that are to not use the uniform population based on DUs times ppb but 1) use BEBR parcel level permanent historic population estimates for calculating historic served populations for per capita or 2) use the uniform gross per capita where the population is based on DUs and ppb but then project from the base year population estimate using the BEBR projected growth rates or 3) use the uniform gross per capita based on DUs and ppb and project from base year estimated served population using the 5 year utility specific growth rate if it can somehow be linked to the BEBR growth rate. We think there should be some additional discussion concerning the the 5 year growth rate.

- **Utility Service Area Residential Population** is the number of dwelling units served, multiplied by an estimate of persons per household (exactly the same as for the Uniform Gross Per Capita measure)

Note: While it is recommended that future demand estimates are based on a Uniform Gross Per Capita method, per capita goals shall be based on Uniform Residential Per Capita rate per water use permit in accordance with new legislation (Subsection 373.0565(2), F.S.). This will require the collection and reporting of served dwelling units and their use by the utilities and may require rulemaking. Compliance with any rules regarding utility reporting of dwelling units and residential use outside of the SWFWMD should be phased to allow utilities to develop the means to collect the data if not currently available.

Commented [kja2]: Add elements of reporting for Conservation goals when established by Conservation Team for clarification of what should be reported and when.

3. Future Demand = Future Population X 5-year Average Gross Per Capita

- a. **Future Population** is required for the calculation of future water demand. The methodology to determine future population described in (1) below will be utilized for/as a *uniform permitting base method*, but may be modified based on demonstration of appropriate circumstances to warrant an alternative method as described below in (2-3).

- 1) Uniform Base Method for Utility Service Area Future Population - Utilize County-level/parcel level forecast of population based on published BEBR-Medium projections for target year(s). If using service area parcel based projections of permanent population, should be multiplied by averaged historic permanent population based per capita.

Note: The BEBR proposed methodology has the combined advantages of consistency across an entire county (so the permanent population projections sum to BEBR total medium projections in split counties) and provision of reasonable spatial distribution of future population based on buildup and standardized growth drivers/inhibitors, and preparation by a neutral third party. While most would agree that this methodology would best further the State's objective of CFWI consistency, there is no budgeted source of funding to produce the necessary parcel based estimates and projections outside of the SWFWMD. Required data and methodologies integral to a parcel based methodology are retained as alternatives below for areas where the parcel-based method is currently possible or if funding for the BEBR parcel based population estimation and projection methodology becomes available.

- 2) Alternative method if BEBR funding is not established: Utilize historic growth rate at utility-level based on average of 5 years of historic population times the base year served dwelling unit population (estimate of total residential dwelling units x estimate of persons per household).

- If supported by justification that 5 years of historic population is not appropriate, consideration of a more appropriate period of time may be warranted.
- Seasonal service area population may be estimated using methods recommended by the DEO. Applicants may also identify tourist population, if known.

- 3) Alternative method if service area has identified potential changes in demographics, planned developments, commercial uses or in some cases, changes in service area boundaries. Such changes must be documented by an appropriate third-party source(s): Utilize a service area growth rate derived from parcel-based projections such as those supplied by GISA, TAZ data or proposed to be supplied by BEBR. The growth rate could be applied to the historic base year estimated service area population whether it is applied to dwelling unit (residential) population,

permanent or functional population estimate. This assumes that the various population cohorts grow at the same rate.

4) *Consideration of conservation goals*

- b. **Projected Annual Water Use:** It is recommended to utilize the most recent 5-year historic average **Uniform Gross Per Capita** for calculating projected water demand.
- 1) Uniform Gross Per Capita (as defined above) - this per capita can be applied to projected utility service area residential population (defined above) which potentially includes both permanent and non-permanent populations, to project future service area **demand**.
 - 2) Permanent Gross Per Capita is the uniform gross use divided by estimated service area permanent population. This per capita can be applied to permanent population projections of the service area to project service area demand.
 - 3) Functional Gross Per Capita is the uniform gross use divided by estimated service area functional population. This per capita can be applied to functional population projections of the service area to project service area demand.

Commented [kja3]: The conservation goals need to be considered in development of future demands and we will look to the conservation team for feedback on how this may be addressed in the rule language based on their work.

Commented [JY4]: If using uniform gross per capita (which may include non-permanent residents) should use a growth rate times base population.

Commented [kja5]: What criteria would these two per capita methods be used? Should they be listed, or not included at all?

4. Additional Concepts for Inclusion in Proposed Rule-Making

B. Elements of Demand Calculation for Utility/Public Supply <100,000 gallons per day

- Recommend same uniform process for calculating existing and future demand as for Utility/Public Supply >100,000 gallons per day for permitting.

C. Additional Concepts for Inclusion in Proposed Rule-making:

1. Submittal of information by utilities to calculate uniform demand estimates. It is anticipated that the rule language should include the phasing in of providing the requested information to allow utilities to make necessary arrangements for compiling the data.
 - a. Submittal of elements listed above that are necessary to comply with calculating Existing and Future Demand (e.g. withdrawals, imported water, exported water , water treatment Loss);
 - b. Submittal of elements listed above that are necessary to comply with calculating Existing and Future Population (e.g. single family residential units and their use and total residential units and their use per year and annual population estimates);
2. Consideration of the use BEBR Medium estimates, population cohorts and projections at county/utility-level, (actual services provided by BEBR would depend upon funding). The RWSP Team is vetting this option for future planning efforts in the CFWI Area to have one consistent methodology and one agency providing the data. The group generally supports any efforts for State agency, Legislative or other funding to have access to this data. Timely State funding for this effort would further the State's interest in planning and regulatory consistency in the CFWI. Other factors for consideration of methods to incorporate include accounting for new large-scale developments that have accelerated timelines and/or were not included in BEBR drivers for population calculation. Documentation of elements not included in BEBR estimates will need to be provided and reviewed with BEBR for confirmation of non-inclusion before considered by the water management districts.

Commented [KPW6]: Perhaps we should begin discussions with the team on an approach to getting the information we need to project demands. Given that annual reporting of these data in the other Districts is very limited or nonexistent I would suggest we begin discussions with SWFWMD rule language and modify as necessary.