State of Utah
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DIVISION OF DRINKING WATER
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POLICY MEMO

DATE: June 28, 2023

TO: All DDW Employees

FROM: Tim Davis, Director

SUBJECT: DDW Detailed Guidance for Water Use Data Reporting and Setting System-Specific Source and Storage Minimum Sizing Requirements

EFFECTIVE DATE: June 28, 2023

ADOPTED DATE: June 28, 2023

Division of Drinking Water Detailed Guidance for Water Use Data Reporting and Setting System-Specific Source and Storage Minimum Sizing Requirements

Table of Contents

Appendices

Appendix A. Utah Code 19-4-104 (Effective July 2018) & 19-4-114 (Effective May 2023)
Appendix B. *A Review of the Division of Drinking Water's Source Sizing Requirements* by Office of the Legislative Auditor General (2014 December) — Web Link
Appendix C. *An In-Depth Follow-up of The Division of Drinking Water's Minimum Source Sizing Requirements* by Office of the Legislative Auditor General (2017 December) — Web Link
Appendix D. *Metering Equipment Alternatives and Analysis* (including AMI Technologies and Metering Equipment Technical Specifications) by Bowen Collins & Associates and Hansen Allen & Luce (2017 April) — Web Link

I. Introduction

A. Overview

In 2018, the Utah Legislature made revisions to Utah Code 19-4 (the Utah Safe Drinking Water Act) that will affect source and storage sizing requirements for public water systems. The revisions to UC 19-4-104 and 19-4-114 require public water systems to collect and report water use data to the Division of Water Rights. The revisions also require the Division of Drinking Water (the Division) to take that data and use it to establish water-system-specific source and storage sizing requirements. Once fully implemented, the system-specific requirements will replace the current state-wide sizing requirements. The revisions to UC 19-4-104 and 19-4-114 became effective in July of 2018 and are provided in Appendix A.

This guidance document provides detailed implementation information related to the 2018 revisions to Utah Code 19-4-104 and 114. This document consists of five chapters:

I. Introduction
II. Definitions
III. Submitting Annual Water Use Data to Set Minimum Sizing Requirements
IV. Submitting an Engineering Study to Set Minimum Sizing Requirements
V. Division of Drinking Water's Interpretation of 2018 Revisions to Utah Code 19-4

The Division encourages readers to focus on the chapters applicable to their specific needs.

B. Background

The legislators revised Utah Code 19-4-104 and 114 as a result of two audit reports completed by the Office of the Legislative Auditor General regarding the minimum sizing standards for public drinking water systems (Utah Administrative Code R309-510). The Utah Division of Drinking Water (DDW) administers R309-510.

1. The first audit report, *A Review of the Division of Drinking Water's Source Sizing Requirements* (see Appendix B), was completed in December 2014, and raised questions about the accuracy of the source capacity sizing requirements for public water systems found in Utah Administrative Code R309-510. The report recommended that DDW review the source capacity requirements and, if necessary, revise R309-510 based on actual water use data.

2. The second audit report, *An In-Depth Follow-up of The Division of Drinking Water's Minimum Source Sizing Requirements* (see Appendix C), was completed in December 2017, and acknowledged the difficulty in revising the current statewide sizing standards based on existing data and DDW's efforts in exploring an alternative approach to regulate water system minimum sizing. The audit report concluded that new legislation may be required to enact a new regulatory framework for water system minimum sizing requirements.

C. Summary of New Requirements

The 2018 legislative revisions to Utah Code 19-4-104 and 114 included the following requirements:

1. Community Water Systems (CWSs) serving 500 people or more must collect and report actual water use data to the Division of Water Rights (DWRi) annually.

2. Per Utah Code 19-4-104(6)(a), the required water use data shall include:
    - Peak Day Source Demand,
    - Average Annual Demand,
    - Number of Equivalent Residential Connections (ERCs), and
    - Quantity of Non-Revenue Water.

3. DDW must set system-specific minimum source and storage sizing requirements based on actual water use data (to replace existing statewide minimum sizing standards).
    a. **Community Water Systems serving over 3,300 people** must submit information to DDW by March 1, 2019, for establishing system-specific sizing requirements. *[It is anticipated that DDW will establish sizing requirements after acceptable data is received.]*
    b. **Community Water Systems serving 500 to 3,300 people** must submit information to DDW by March 1, 2023, for establishing system-specific sizing requirements. DDW must establish sizing requirements by October 1, 2023.
    c. **Community Water Systems serving fewer than 500 people**: DDW Director shall establish a schedule to transition these systems to system-specific requirements.
    d. **Non-Community Water systems**: DDW Director shall establish minimum sizing requirements as appropriate.

4. The information necessary to set the system-specific requirements may be based on:
    a. Water use data submitted by CWSs as required in Utah Code 19-4, or
    b. An engineering study (historical or comparable data may be included).

Quick summary tables of the new water use data required to be collected and a schedule of the data use reporting requirements arranged by water system type are shown at the end of this chapter.

D. Contacts

Three state agencies are involved in processing the actual water use data reported by CWSs.

1. The Division of Drinking Water (DDW) has the primary role of implementing the revisions to Utah Code 19-4-104 and 114, with specific focus on setting minimum sizing requirements for public drinking water systems.
2. The Division of Water Rights (DWRi) administers the water use data reporting program, which supports water rights related regulations.
3. The Division of Water Resources (DWRe) administers the program that verifies the accuracy of the data reported by water systems. The DWRe relies on the verified data for water conservation and long-term planning.

Below are primary contacts in these agencies for water systems that may have questions regarding water use data reporting and Utah Code 19-4-104 and 114.

Division of Drinking Water (DDW)

Water Use Data Collection/Reporting and Minimum Sizing Requirements
- Michael Newberry — (385) 515-1464, mnewberry@utah.gov
- Dani Zebelean — (385) 278-5110, dzebelean@utah.gov
- Nathan Lunstad — (801) 674-2553, nlunstad@utah.gov

Funding Assistance for Drinking Water Infrastructure and Metering/SCADA Equipment
- Michael Grange — (801) 536-0069, mgrange@utah.gov
- Heather Pattee — (385) 515-1498, hpatee@utah.gov

Division of Water Rights (DWRi)

Annual Water Use Data Reporting
- Jim Reese — (385) 228-6109, jreese@utah.gov
- Brandon Mellor — (801) 927-7433, bmellor@utah.gov

Division of Water Resources (DWRe)

Water Use Data Validation
- Rachel Shilton — (801) 538-7271, rachelshilton@utah.gov

Funding Assistance and Water Audit
- Todd Stonely — (801) 538-7277, toddstonely@utah.gov

Summary of New Water Use Data Reporting and PWS Minimum Sizing Requirements
(Legislative Revisions to Utah Code 19-4 in 2018)

I. Annual Water Use Data Reporting by All Community Water Systems Serving 500 People or More

Water Use Data to Be Collected:	Reporting Frequency:	Report Data to:	Reporting Due:
1. Peak Day Source Demand 2. Average Annual Demand *3.* Number of Retail Equivalent Residential Connections *[Number of Total ERCs for Retail Service]* 4. Quantity of Non-revenue Water	Annual	Division of Water Rights (**DWRi**)	**March 1, 2019** for 2018 data; as specified by DWRi for future years

II. Schedule of Water Use Data Reporting and Minimum Sizing Requirements for Community Water Systems (CWSs)

Water System Type:	3-years of Data Due:	Report Data to:	DDW Sets System-Specific Sizing Standards by:
CWSs serving over 3,300 people	**March 1, 2019**	● DWRi – Annual Water Use Data as described in 19-4-104(6)(a) ● DDW - Engineering Study	After Division of Drinking Water (**DDW**) receives acceptable data
CWSs serving between 500 and 3,300 people	**March 1, 2023**	● DWRi – Annual Water Use Data as described in 19-4-104(6)(a) ● DDW - Engineering Study	October 1, 2023
CWSs serving fewer than 500 people	TBD	DWRi – Water Use Data (as previously required by DWRi)	TBD
Wholesale Water Suppliers that serve a total population of more than 10,000 people and the wholesale population is 75% or more of the total population served.	March 1, 2019 (assume to be same as CWSs serving over 3,300 people)	DWRi – Annual Water Use Data	Not Applicable

III. Non-Community Water Systems

DDW Director to establish minimum source and storage sizing standards - no water use reporting or deadlines given for water systems

II. Definitions and Calculations

This chapter defines the terms and explains the calculations related to water use data reporting, data evaluation, minimum sizing, and source and storage capacity evaluation.

1. The terms described in this chapter are grouped into two categories:

    - **Water use data terms used in Utah Code 19-4-104 and 114**; and
    - **Other terms used in this document** for data evaluation, minimum sizing determination, and capacity evaluation.

2. This chapter also includes **a summary page of the equations** used in this document for data calculation, source and storage minimum sizing determination, and water system capacity evaluation.

3. **A summary table at the end of this chapter** identifies the terms, the water use data that community water systems (CWSs) need to report to Division of Water Rights (DWRi) annually, the data that will be transferred or automated in the DWRi program or in the Division of Drinking Water (DDW) program, and these agencies' actions.

Water Use Data Terms in Utah Code 19-4-104 and 114

Four water use data terms are mentioned in Utah Code 19-4-104(6)(a). Utah Code 19-4 requires CWSs serving 500 people or more to report these data to DWRi annually. The water use data submitted by CWSs to DWRi will be shared with DDW.

These water use data terms are **described in detail in this section (in A through D below**) to define and standardize the data that must be reported to DWRi.

A. Peak Day Source Demand

1. Peak Day Source Demand is the **total flow into a public water system** to meet the demand of the water system **on the day of highest water consumption in a calendar year**. The Peak Day Source Demand value represents the source demand for the entire water system during the peak day of water usage.

2. The Peak Day Source Demand is **not the daily average of the peak month source demand**. The daily average of peak month source demand is less than the Peak Day Source Demand. Reporting the daily average of the peak month source demand as the Peak Day Source Demand is not acceptable.

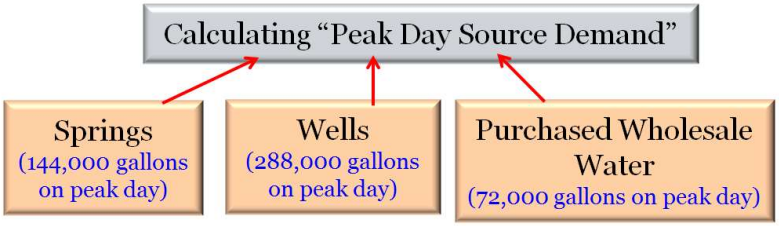
3. The Peak Day Source Demand typically is met by the water flowing into the system **from all water sources**, such as wells, springs, water supply from a water treatment plant, wholesale water purchased from another water system, etc.

4. The Peak Day Source Demand is **not the demand measured at the service meters of the retail or wholesale connections**, because the Peak Day Source Demand must account for

water losses and unmetered water use in the distribution system. Not planning for the true Peak Day Source Demand can result in inaccurate infrastructure sizing and public health risk.

5. **Example – Calculating "Peak Day Source Demand"**

   (1) The example below shows that, in a specific year, a water system's Peak Day Source Demand is met by receiving 144,000 gallons from the springs, 288,000 gallons from the wells, and 72,000 gallons purchased from a wholesale water supplier, on the day of highest water consumption.
   (2) This water system's Peak Day Source Demand data for this year would be the sum of these three values, i.e., a total of 504,000 gallons of water flowing from the sources to this water system during the peak day of water use.
   [144,000 + 288,000 + 72,000 = 504,000]



6. The Peak Day Source Demand value is a new mandatory data reporting requirement per legislative revisions to Utah Code 19-4-104 in 2018. Water systems are required to gather and report the Peak Day Source Demand data and the specific date of the highest water consumption in a year to DWRi.

7. Incidents such as major water main breaks, fire suppression, or unusual flushing or cleaning, typically are not included in the required reporting for the water systems.

8. **CWSs Supplying Water to Wholesale Connections** — if a CWS delivers drinking water to other regulated public water systems, those connections are considered **wholesale connections** (not retail connections). A water system's **retail connections** include its residential and non-residential service connections. When reporting the water system's "Peak Day Source Demand" data to DWRi, CWSs will be asked to report the portion of the Peak Day Source Demand delivered to wholesale connections during the peak day, in addition to the total amount of the Peak Day Source Demand.

B. Average Annual Demand

1. Average Annual Demand is the **total quantity** of drinking water flowing into a public water system **within a calendar year**. The "Average Annual Demand" term is referenced in Utah Code19-4-104(6)(a). It is in fact a "total" annual demand.

2. The "Average Annual Demand" data typically consist of **the metered data of all water sources in a water system**, including individual water sources (such as wells or springs) and the water purchased from other water systems.

3. DDW will use the data of individual water sources and purchased water reported to DWRi to calculate an "Average Annual Demand" value for the entire water system.

4. **CWSs Receiving Water through Wholesale Connections** — if a CWS receives drinking water from other regulated public water systems, it will be asked to report in the DWRi online reporting program the amount of water purchased from other water systems (**wholesale purchase**), in addition to the amount of water flowing into the system from individual water sources.

5. **CWSs Supplying Water to Wholesale Connections** — if a CWS delivers drinking water to other regulated public water systems, those connections are considered **wholesale connections** (not retail connections). A water system's **retail connections** include its residential and non-residential service connections. The water systems will be asked to report in the DWRi online reporting program the amount of water delivered to other water systems (wholesale delivery), in addition to the amount of water delivered to its own retail connections.

C. Number of Equivalent Residential Connections for Retail Service

1. "Number of Equivalent Residential Connections for Retail Service" (as referenced in Utah Code19-4-104) is referred as **Total Number of ERCs** in this document for clarity and accurate depiction of calculation methodology.

2. The "Total Number of ERCs" term represents the total number of equivalent residential connections (ERCs) of a water system's retail customers, including:

    - the number of residential service connections, and
    - the number of equivalent residential connections (ERCs) for non-residential service connections (e.g., commercial, industrial, institutional connections).

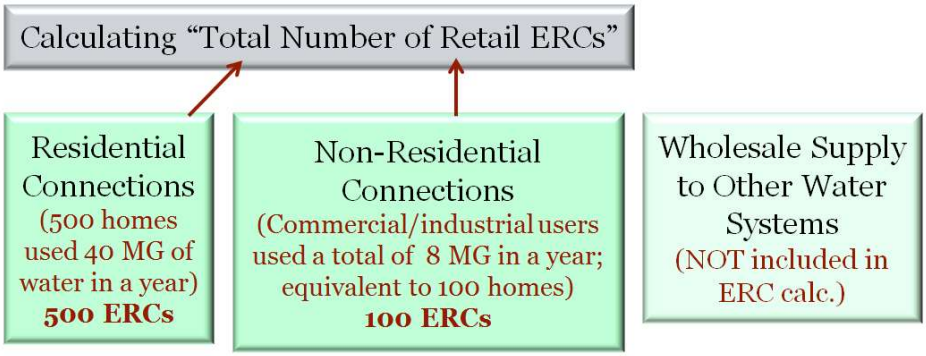
3. Based on the data reported by a water system, the DWRi online water use data reporting program estimates the "Total Number of ERCs" for the water system automatically. Water systems will have the option to either accept the automated "Total Number of ERCs" value or to enter a different value if a more accurate estimate is available.

4. **Calculating the ERCs for Non-residential Service Connections** — the annual metered drinking water volumes delivered to non-residential connections are compared to the

average of annual metered drinking water volumes delivered to a single-family residential connection. For example, to calculate the number of ERCs that represent a specific non-residential connection in a water system, the total metered demand (in gallons per day) delivered to a non-residential connection is divided by the average demand for a single residential connection (in gallons per day) in the water system.

5. **CWSs Supplying Water to Wholesale Connections** — if a CWS delivers drinking water to other regulated public water systems, those connections are considered **wholesale connections** (not retail connections). The "Total Number of ERCs" data are calculated **based on a water system's retail connections only** (including residential and non-residential service connections). The number of wholesale connections does not need to be converted to ERCs and is not included when calculating "Total Number of ERCs."

6. **Example – Calculating "Total Number of Retail ERCs"**



(1) In the example above, this water system's retail connections include 500 single-family residential connections (i.e., 500 homes) and a number of non-residential connections (i.e., commercial, industrial and institutional connections).
(2) The 500 homes represent 500 equivalent residential connections (ERCs).
(3) These 500 homes used a total of 40,000,000 gallons (40 MG) of water in a year. Therefore, on average, each home used 80,000 gallons this year.
[40,000,000 gallons ÷ 500 ERCs = 80,000 gallons/ERC]
(4) The non-residential connections used a total of 8,000,000 gallons (8 MG) of water in this specific year. The demand of these non-residential connections equals the amount of water used by 100 homes or 100 ERCs.
[(8,000,000 gallons) ÷ (80,000 gallons/ERC) = 100 ERCs]
(5) This water system also supplies drinking water to other regulated public drinking water system(s), i.e., has water demand from wholesale connections, but the number of wholesale connections is not included when calculating the "Total Number of ERCs."
(6) The estimated "Total Number of ERCs" for this water system is the sum of 500 ERCs (residential connections) and 100 ERCs (non-residential connections), which is 600 ERCs. [500 + 100 = 600 ERCs]

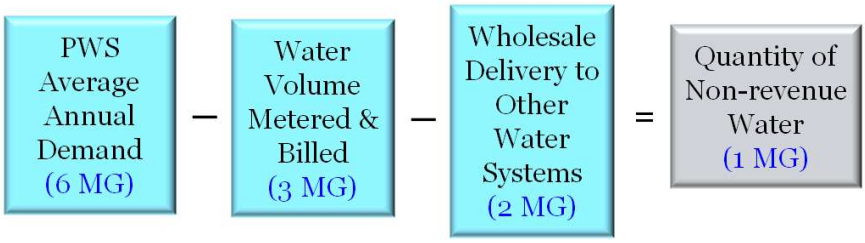
D. Quantity of Non-Revenue Water

1. The "Quantity of Non-Revenue Water" value equals the "Average Annual Demand" minus the "total drinking water volume metered for billing in a year" and minus the "wholesale delivery to other water systems."

Quantity of Non-Revenue Water (in gallons) =
[Average Annual Demand] – [Water Volume Metered/Billed] – [Wholesale Delivery Outflow]

2. **Example – Calculating "Quantity of Non-Revenue Water"**

   (1) A water system's measured "Average Annual Demand" is 6 million gallons (6 MG) in a specific year.
   (2) The "amount of water metered and billed" by this water system is 3 MG in the same year.
   (3) This water system also supplies 2 MG of drinking water to neighboring water systems that year.
   (4) This water system's "Quantity of Non-Revenue Water" data for this year is calculated to be 1 MG. [6 MG – 3MG – 2MG = 1 MG]



3. Unmetered park or cemetery connections, leaks, or flushing of hydrants are common reasons of non-revenue water.

4. <u>The "Quantity of Non-Revenue Water" data are calculated in the DWRi program automatically</u> based on the "total drinking water volume metered for billing" data (reported by a water system), the "wholesale delivery to other water systems" data (also reported by a water system), and the "Average Annual Demand" data (generated in the DWRi online water use data reporting program).

<u>Other Terms Used in This Document</u>

Other terms are used in this document to illustrate the methodology of setting system-specific source and storage minimum sizing requirements. They are **described in detail in E through L below.**

Some water systems may need to gather additional data (i.e., in addition to the four data terms mentioned in Utah Code 19-4-104), so representative system-specific minimum sizing requirements can be set based on accurate data. Below are three examples:

1. Water systems that operate seasonally will need to gather the information of the number of days in the operation season.

2. Water systems that supply wholesale water to other water systems will need to gather information related to water delivered to meet the demand of their own retail connections and water delivered to meet the demand of wholesale connections if they are required to have system-specific minimum sizing requirements.

3. Water systems that use drinking water sources to supply a non-drinking water system such as a secondary water or pressurized irrigation system will need to measure the water delivered to the irrigation system and report the use as an irrigation water source to the DWRi.

E. "Peak Day Demand per ERC" Data

1. The "Peak Day Demand per ERC" data is calculated by dividing the "Peak Day Source Demand" data by the "Total Number of ERCs" data.

$$\textbf{"Peak Day Demand per ERC" Data} = \frac{\text{[Peak Day Source Demand]}}{\text{[Total Number of ERCs]}}$$
(in gallons/day)

2. The "Peak Day Demand per ERC" data represents the measured source flow to meet the demand of a residential connection (or an equivalent residential connection, ERC) on the day of the highest water consumption in a calendar year in a public water system.

3. The "Peak Day Demand per ERC" data represents the demand **measured at the sources** (not at the service meter at a retail connection). Due to water loss and unmetered water use in the distribution system, the "Peak Day Demand per ERC" data is higher than the data measured at the service meters.

4. Based on the "Peak Day Source Demand" data (reported by CWSs to DWRi) and the "Total Number of ERCs" data (accepted by CWSs in the DWRi reporting program), the DDW program will calculate the "Peak Day Demand per ERC" data automatically. CWSs will not be asked to enter a "Peak Day Demand per ERC" value in the DWRi online reporting program.

5. **CWSs Supplying Water to Wholesale Connections** — if a CWS delivers drinking water to other regulated public water systems, those connections are considered **wholesale connections** (not retail connections). The Peak Day Demand per ERC data are calculated **based on the data related to retail connections only** (including residential and non-residential service connections).

F. "Average Annual Demand per ERC" Data

1. The "Average Annual Demand per ERC" data is calculated by dividing the "Average Annual Demand" data by the "Total Number of ERCs" data.

$$\text{"Average Annual Demand per ERC" Data} = \frac{\text{[Average Annual Demand] (in gallons/year)}}{\text{[Total Number of ERCs]}}$$

2. The "Average Annual Demand per ERC" data represents the measured source flow to meet the demand of a residential connection (or an equivalent residential connection, ERC) in a calendar year in a public water system.

3. The "Average Annual Demand per ERC" data represents the demand **measured at the sources** (not at the service meter of a retail connection). Due to water loss and unmetered water use in the distribution system, the "Average Annual Demand per ERC" data typically are higher than the data measured at the service meters.

4. The "Average Annual Demand per ERC" data is calculated in the DDW program automatically based on the "Average Annual Demand" data and the "Total Number of ERCs" data transferred from DWRi to DDW. CWSs will not be asked to enter an "Annual Average Demand per ERC" value in the DWRi online reporting program.

5. **CWSs Supplying Water to Wholesale Connections** — if a CWS delivers drinking water to other regulated public water systems, those connections are considered **wholesale connections** (not retail connections). The Average Annual Demand per ERC data is calculated **based on the data related to retail connections only** (including residential and non-residential service connections), i.e., using the **retail portion of the water system's Average Annual Demand data** and the **total number of retail ERCs data**.

G. "Equalization Storage per ERC" Data

1. From an engineering perspective, **equalization storage** enables a water system to operate properly when peak demands on the water system exceed the water source capacity.

2. From a regulatory perspective, regulatory criteria for minimum equalization storage vary from state to state. Utah chooses to **set the minimum equalization storage requirement at a volume that is equivalent to the amount of water needed to meet the average day demand for indoor and outdoor water uses** for public water systems.

3. Each water system should **evaluate its unique system demand pattern, source capacity and reliability, system configuration, redundancy and operational needs, and determine its storage needs accordingly**. A water system's actual storage need may exceed the minimum equalization storage sizing required by the state.

4. The "Equalization Storage per ERC" data are calculated by dividing the "Average Annual Demand per ERC" data by the number of "Operational Days in a Year" reported by the water system to DWRi.

> **"Equalization Storage per ERC" Data** = [Average Annual Demand per ERC] (in gallons) / [Operational Days in a Year]

5. CWSs will not be asked to enter the "Equalization Storage per ERC" data in the DWRi online reporting program. The "Equalization Storage per ERC" data are automatically calculated in the DDW program based on each year's "Average Annual Demand per ERC" data (calculated in the DDW program) and "Operational Days in a Year" value (reported by CWSs in the DWRi program).

H. Operational Days in a Year

1. The "Operational Days in a Year" is the number of days a water system is in operation in a year.

2. The "Operational Days in a Year" is calculated **based on the starting date and the ending date of the operating season.**

    a. For water systems that operate throughout the year, the "Operational Days in a Year" value typically is 365 days.
    b. For seasonal systems that do not operate throughout the year, the "Operational Days in a Year" equals the number of days the system provides water. For example, the value for a system that operates from April 1 through October 31 would be 213 days.

3. Accurate information of "Operational Days in a Year" is especially important for seasonal water systems. In some cases, if accepted by DDW, the number of "Operational Days in a Year" used to calculate the "Equalization Storage per ERC" data may be customized or adjusted to reflect representative "Equalization Storage per ERC" data, so the drinking water infrastructure can be adequately sized.

4. Water systems will be asked to enter the starting date and the ending date of the operating season in a specific year in the DWRi online water use data reporting program. The DWRi program will automatically calculate the number of "Operational Days in a Year" value based on the starting and ending dates entered by water systems.

I. System-Specific Variability Factor

1. Based on preliminary analysis of past data submitted by CWSs, the Division anticipated encountering various ranges of data variation in the future when evaluating water use data for system-specific minimum sizing requirements. A "System-Specific Variability Factor" was applied to account for data quality and consistency when DDW sets the system-specific minimum sizing requirements. However, after evaluating the results from the

system-specific minimum sizing program from 2019 to March 2023, the Division found the variability factor to be overly conservative. The Division was taking the highest single day usage and comparing it to an already reduced source capacity. As such, many systems had a source deficiency solely due to the additional demand added by the variability factor. As of May 2023, the Division has decided to discontinue the use of the variability factor. The variability factor will remain on the reports to use when systems want to increase their system-specific sizing.

- If a system would like to propose a "System-Specific Variability Factor" they can provide the following documentation:
  - Technical memo from a water system representative or a P.E. registered in the State of Utah documenting reasons for the increased variability.
    - Example: System uses drinking water infrastructure as a backup for irrigation in the event of a drought, the system is responsible for flows to other systems not represented in the sizing standards, etc.

2. Documentation from an accepted Master Plan with the reasons for the increased variability.

J. Peak Day Demand per ERC Minimum Sizing Requirement

1. The "Peak Day Demand per ERC Minimum Sizing Requirement" is the regulatory requirement of the minimum source flow that a public water system must be able to supply to each residential connection or an equivalent residential connection (ERC) on the day of the highest water consumption in a year.

2. The system-specific "Peak Day Demand per ERC Minimum Sizing Requirement" is used to evaluate a water system's current source capacity in meeting the Peak Day Source Demand and to estimate the future source capacity needed for new developments.

3. The "Peak Day Demand per ERC Minimum Sizing Requirement" applies to **the source capacity** (not the demand measured at the service meter). To account for water loss and unmetered water use in the distribution system, the "Peak Day Demand per ERC Minimum Sizing Requirement" typically is set higher than the data measured at the service meter.

4. The "Peak Day Demand per ERC Minimum Sizing Requirement" is calculated by multiplying the selected "Peak Day Demand per ERC" value by the sum of 100% and the "System-Specific Variability Factor" if there is one proposed by the water system.

Peak Day Demand per ERC Minimum Sizing Requirement (in gallons/day) = ["Peak Day Demand per ERC" selected value] × [1 + System-Specific Variability Factor]

5. The DDW process of establishing the "Peak Day Demand per ERC Minimum Sizing Requirement" consists of the following steps:

a. Process and convert the "Peak Day Source Demand" data (reported by a CWS to DWRi) to the "Peak Day Demand per ERC" data.
b. Evaluate the "Peak Day Demand per ERC" data and select a specific value for further calculation.
c. Select a "System-Specific Variability Factor" of zero unless one is proposed by the water system.
d. Apply the "System-Specific Variability Factor" to the selected "Peak Day Demand per ERC" value and set the "Peak Day Demand per ERC Minimum Sizing Requirement."

K. Average Annual Demand per ERC Minimum Sizing Requirement

1. The "Average Annual Demand per ERC Minimum Sizing Requirement" is the regulatory requirement of the minimum source flow that a public water system must be able to supply in a calendar year to each residential connection or an equivalent residential connection (ERC).

2. The system-specific "Average Annual Demand per ERC Minimum Sizing Requirement" is used to evaluate a water system's current source capacity in meeting the Average Annual Demand and to estimate the future water source capacity needed for new developments.

3. The "Average Annual Demand per ERC Minimum Sizing Requirement" applies to **the source capacity** (not the demand measured at the service meter). To account for water loss and unmetered water use in the distribution system, the "Average Annual Demand per ERC Minimum Sizing Requirement" typically is set higher than the data measured at the service meter.

Average Annual Demand per ERC Minimum Sizing Requirement (in gallons/year) = ["Average Annual Demand per ERC" selected value] × [1 + System-Specific Variability Factor]

4. The "Average Annual Demand per ERC Minimum Sizing Requirement" is calculated by multiplying the selected "Average Annual Demand per ERC" value by the sum of 100% and the "System-Specific Variability Factor" if there is one proposed by the water system.
5. The DDW process of establishing the "Average Annual Demand per ERC Minimum Sizing Requirement" consists of the following steps:

a. Process and convert the "Average Annual Demand" data (transferred from DWRi to DDW) to the "Average Annual Demand per ERC" data.
b. Evaluate the "Average Annual Demand per ERC" data and select a specific value for further calculation.
c. Select a "System-Specific Variability Factor" of zero, unless one is proposed by the water system based on the range of data variation..
d. Apply the "System-Specific Variability Factor" to the selected "Average Annual Demand per ERC" value to set the "Average Annual Demand per ERC Minimum Sizing Requirement."

L. Equalization Storage per ERC Minimum Sizing Requirement

1. The "Equalization Storage per ERC Minimum Sizing Requirement" is Utah's regulatory requirement of the minimum storage volume that a public water system must provide for each residential connection or an equivalent residential connection (ERC).

2. The system-specific "Equalization Storage per ERC Minimum Sizing Requirement" is used to evaluate a water system's current storage capacity in meeting the water storage needs and to estimate the future water storage capacity associated with new developments.

3. The "Equalization Storage per ERC Minimum Sizing Requirement" is calculated by multiplying the selected "Equalization Storage ERC" value by the sum of 100% and the "System-Specific Variability Factor" if there is one proposed by the water system.

Equalization Storage per ERC Minimum Sizing Requirement (in gallons) =
["Equalization Storage per ERC" selected value] × [1 + System-Specific Variability Factor]

4. The DDW process of establishing the "Equalization Storage per ERC Minimum Sizing Requirement" consists of the following steps:

    a. Process and convert the "Average Annual Demand" data (transferred from DWRi to DDW) to the "Average Annual Demand per ERC" data.
    b. Calculate the "Equalization Storage per ERC" data using the "Average Annual Demand per ERC" data and the "Operational Days in a Year" data (reported by CWSs to DWRi). Select a specific "Equalization Storage per ERC" value for further calculation.
    c. Use the same "System-Specific Variability Factor" that is used to calculate the "Average Annual Demand per ERC Minimum Sizing Requirement" for calculating the "Equalization Storage per ERC Minimum Sizing Requirement."
    d. Apply the "System-Specific Variability Factor" to the selected "Equalization Storage per ERC" value to set the "Equalization Storage per ERC Sizing Requirement."

Summary of Equations

The following page contains a summary of the equations used in this document to calculate the data, determine minimum sizing requirements, and evaluate water system capacity.

To Calculate the Data:

Quantity of Non-Revenue Water (in gallons) =
[Average Annual Demand] − [Water Volume Metered/Billed] − [Wholesale Delivery Outflow]

"Peak Day Demand per ERC" Data = $\frac{\text{[Peak Day Source Demand] (in gallons/day)}}{\text{[Total Number of ERCs]}}$

"Average Annual Demand per ERC" Data = $\frac{\text{[Average Annual Demand] (in gallons/year)}}{\text{[Total Number of ERCs]}}$

"Equalization Storage per ERC" Data = $\frac{\text{[Average Annual Demand per ERC] (in gallons)}}{\text{[Operational Days in a Year]}}$

To Calculate the "per ERC Minimum Sizing Requirements":

Peak Day Demand per ERC Minimum Sizing Requirement (in gallons/day) =
["Peak Day Demand per ERC" selected value] × [1 + System-Specific Variability Factor]

Average Annual Demand per ERC Minimum Sizing Requirement (in gallons/year) =
["Average Annual Demand per ERC" selected value] × [1 + System-Specific Variability Factor]

Equalization Storage per ERC Minimum Sizing Requirement (in gallons) =
["Equalization Storage per ERC" selected value] × [1 + System-Specific Variability Factor]

To Calculate Source Capacity:

Source Capacity Needed to Meet the Peak Day Source Demand (in gallons/day) =
[Peak Day Demand per ERC Minimum Sizing Requirement] × [Total Number of ERCs]

Source Capacity Needed to Meet the Average Annual Demand (in gallons/year) =
[Average Annual Demand per ERC Minimum Sizing Requirement] × [Total Number of ERCs]

To Calculate Storage Capacity:

Total Storage Capacity Required (in gallons) =
[Equalization Storage] + [Fire Suppression Storage] + [Emergency Storage (optional)]

Equalization Storage Required in Utah (in gallons) =
[Equalization Storage per ERC Minimum Sizing Requirement] × [Total Number of ERCs]

Summary of Data Terms & Agency Actions

The following table summarizes the terminology, data required to be reported to DWRi by water systems, and actions by CWSs, DDW and DWRi.

Data Term	CWSs – Report Data to DWRi	DWRi – Process Data	DDW – Min. Sizing Eval.
Peak Day Source Demand	● Total source demand during peak day for entire water system ● The wholesale portion of the source demand ● The specific date of the highest water consumption in a year	Transfer data to DDW	Accept data from DWRi
Average Annual Demand	● Annual data of individual water sources ● Annual data of purchased water	Transfer data to DDW	Calculate Average Annual Demand using data from DWRi
Number of Equivalent Residential Connections for Retail Service **[Total Number of ERCs]**	● Number of residential connections ● Annual water quantity delivered to residential connections ● Number of non-residential connections ● Annual water quantity delivered to non-residential connections	Estimate Total Number of ERCs for entire water system automatically (Water systems may enter a different value)	Accept "Total Number of ERCs" value selected by water systems
Quantity of Non-Revenue Water	● Annual data of individual water sources ● Annual data of purchased water ● Water volume metered for retail billing ● Wholesale delivery outflows	Calculate the quantity of non-revenue water	—
Peak Day Demand per ERC	—	—	Evaluate data & select a value to calculate min. sizing requirement
Average Annual Demand per ERC	—	—	Evaluate data & select a value to calculate min. sizing requirement

Equalization Storage per ERC	—	—	Evaluate data & select a value to calculate min. sizing requirement
Operational Days in a Year	● Starting date of operating season ● Ending date of operating season	Calculate the number of operational days	Accept data from DWRi

III. Submitting Annual Water Use Data to Set Minimum Sizing Requirements

Per Utah Code 19-4-114, the information necessary for Division of Drinking Water (DDW) to set the system-specific requirements may be based on:

1. Water use data submitted by water systems to Division of Water Rights (DWRi) per Utah Code 19-4-104(1)(c)(iv), or
2. An engineering study or at least 3 years of historical water use data.

This chapter (Chapter III) outlines the data analyzing process and information related to the first option, i.e., using the annual water use data required in Utah Code 19-4-104(6)(a) to establish system-specific minimum source and storage sizing requirements for Community Water Systems (CWSs).

If a public water system wishes to propose alternative minimum sizing requirements that are different from the values selected by DDW using the methodology described in this chapter, the next chapter (Chapter IV) provides detailed information related to the required engineering report and supporting information that a CWS must submit with an alternative sizing request to DDW.

The DDW sets the "minimum" (not maximum) sizing requirements for public water systems. Water systems may establish system-specific sizing requirements that are above the minimum sizing requirements set by the state to address operational or design concerns.

A. Annual Water Use Data Needed to Set Minimum Sizing Requirements

Minimum Quantity of Data Needed ─ Water Use Data in Utah Code 19-4-104(6)(a)

Utah Code 19-4-104(6)(a) outlines four actual water use data types that a CWS must report to DWRi annually. When a CWS relies on actual water use data to set system-specific minimum sizing requirements, the minimum quantity of data that DDW will need is described below:

1. **Peak Day Source Demand** (for entire water system) — at least 3 years of data
2. **Average Annual Demand** (for entire water system) — at least 3 years of data
3. **Total Number of ERCs** [Number of Equivalent Residential Connections for Retail Service] ─ at least 3 years of data
4. **Quantity of Non-revenue Water** (for entire water system) ─ at least 3 years of data

Additional Data ─ May be Needed for System-Specific Minimum Sizing Requirements

In many cases, water systems need to collect additional information, described below, to assist in establishing more representative system-specific minimum sizing requirements.

5. **Additional supporting information, assumptions, and justifications** (if applicable) **for calculating the following 3 types of "per ERC" data**:

    a. Peak Day Source Demand per ERC
    b. Average Annual Demand per ERC

c. Equalization Storage per day per ERC

These "per ERC" data are evaluated, and specific values will be selected and used for calculating the corresponding system-specific "per ERC minimum sizing requirements.

6. **Seasonal Water Systems & Number of Operational Days in a Year**

    a. Water systems that operate seasonally should track and accurately report the starting date and ending date of the operation season each year.
    b. The number of days in operation in a year reported by a water system should be carefully verified, because this value will affect the "Equalization Storage per ERC" data that will be subsequently used to evaluate this water system's "Equalization Storage per ERC minimum sizing requirement."

7. **CWSs <u>Supplying</u> Water to Wholesale Connections**

    a. **Wholesale water suppliers are subject to the water use data reporting requirements** in Utah Code 19-4-104.
    b. Water systems <u>supplying</u> water to wholesale connections will need to report the following data:
        i. "Peak Day Source Demand" for the entire water system
        ii. The portion of the "Peak Day Source Demand" delivered to wholesale connections (wholesale demand)
        iii. "Average Annual Demand" for the entire water system (which will be calculated based on the reported data of individual water sources and purchased water)
        iv. The portion of the "Average Annual Demand" delivered to retail connections (retail demand)
        v. The portion of the "Average Annual Demand" deliver to wholesale connections (wholesale demand)
    c. **A wholesale water supplier may be exempt from the system-specific minimum sizing requirements** in Utah Code 19-4-114, if it serves a total population of more than 10,000 persons and its wholesale population is 75% or more of the total population served.

8. **Storage Volume for Fire Suppression Water**

    a. <u>CWSs are not required to report this information to the Division of Water Rights (DWRi) during annual reporting of water use data.</u>
    b. <u>This information is needed from a water system when DDW needs to complete an evaluation of a water system's storage capacity</u>, for example, when DDW assesses a water system's overall storage capacity during a sanitary survey, or when DDW estimates a projected storage capacity for future growth during plan review of a proposed project.
    c. If a water system is required to provide water for fire suppression by local fire code official or if fire hydrants intended for fire suppression purpose exist or will exist in the distribution system, when this water system's capacity needs to be evaluated,

the water system must provide the required fire suppression storage information, as determined by the local fire code official, to DDW. Fire code officials may require a specific fire suppression storage volume (in gallons) or require a minimum fire flow (in gallons per minute) and duration (in minutes). The fire suppression storage volume is factored into the DDW storage capacity evaluation.

d. DDW is not the authority to enforce fire code requirements. DDW's authority is to ensure adequate storage sizing of drinking water infrastructure for fire suppression water according to Utah Administrative Code R309-510.

B. Guidance on Collecting and Reporting Annual Water Use Data

This section provides guidance to CWSs regarding collecting and reporting the annual water use data stated in Utah Code 19-4-104(6)(a).

1. To comply with the new requirement of reporting actual water use data per Utah Code 19-4, CWSs serving 500 people or more need to begin collecting water use data in 2018 and reporting it to the DWRi in 2019 (no later than March 1, 2019).

2. Water systems will need to continue to collect and report the required water use data to DWRi each year.

3. **"Peak Day Source Demand" Data**

    a. It is critical that water systems affected by Utah Code 19-4 plan in advance and start gathering accurate peak day source demand data.

    b. A water system should identify the likely period of Peak Day Source Demand and have a mechanism in place to collect daily water use data when the Peak Day Source Demand is expected to occur.

    c. Peak Day Source Demand often occurs during the summer months and at a particular period, such as a holiday weekend. The Peak Day Source Demand for some water systems, such as water systems serving ski resorts, may occur outside of the summer months.

    d. Peak Day Source Demand includes all water sources that flow into a water system during the peak day. If a water system receives purchased wholesale water from other water systems, it will need to gather the data from its own sources and the data from the purchased wholesale water during the identified peak day.

    e. The Peak Day Source Demand is not the daily average of the peak month source demand. The daily average of peak month source demand is less than the Peak Day Source Demand. Reporting the daily average of the peak month source demand as the Peak Day Source Demand is not acceptable. Doing so can result in inaccurate water infrastructure sizing and public health risk.

4. **"Average Annual Demand" Data**

    a. In addition to Peak Day Source Demand, a water system will also have to measure, collect, and report total annual water use.

    b. If a water system purchases wholesale water from other water systems, it will need to gather the average annual demand data from its own sources and the data of the purchased wholesale water during that year.

5. **"Total Number of ERCs" Data**

    a. The DWRi online reporting program will provide an estimated "Total Number of ERCs" value through automated conversion. The automated calculation is based on the number and types of retail connections (residential and non-residential types) and the annual water use data associated with the connection types reported by water systems.

    b. Water systems will have the option of accepting the estimated "Total Number of ERCs" value generated by the DWRi program or replacing it with a more accurate number along with an explanation.

6. **Metering/SCADA Equipment**

    a. A water system should evaluate its current metering equipment and SCADA equipment/contract and determine whether it has the ability to collect the required data.

    b. If a water system **has** the equipment to measure, collect, and record the required data (including Peak Day Source Demand), it should gather the data (especially during the peak use season) and report the required water use data to DWRi annually.

    c. **If a water system's existing equipment cannot measure, collect, or record the required water use data**, the Division recommends the following:
        i. Plan to install the necessary equipment (e.g., smart meter, flow meter, staff gauge, flow measuring weir, tank level indicator) immediately if possible, or make alternative plans to obtain the peak day demand data on a temporary basis (e.g., manual read by the stopwatch and bucket method, manual reading of a staff gauge or weir).
        ii. DDW advises against hastily reporting speculative water use data to fulfill the reporting requirement. Reporting inaccurate data will lead to erroneous sizing of drinking water infrastructure and result in public health risk.
        iii. Consider the option of entering into a corrective action agreement with DDW immediately, which will establish a compliance schedule and allow additional time for implementation.
        iv. Consider contacting DDW and/or other funding agencies to seek funding assistance in upgrading metering/SCADA equipment.

v. Consider adjusting water rates and build up the financial capability to upgrade and replace metering/SCADA equipment.

d. Appendix D of this document provides a web link for a technical report, ***Metering Equipment Alternatives and Analysis****,* by Bowen Collins & Associates and Hansen Allen & Luce. This report contains detailed information regarding AMI Technologies (Advanced Metering Infrastructure). It also contains a template for metering equipment technical specifications that can be useful to water systems or consultants if they intend to install or upgrade equipment to gather the required water use data. The Division recommends reading this report carefully before starting meter installation or upgrade projects.

e. For funding assistance installing or upgrading metering and SCADA equipment, water systems can contact:

- Division of Drinking Water— Michael Grange, (801-536-0069), mgrange@utah.gov

- Division of Water Resources — Shalaine DeBernardi, (801-652-1668), shalainedebernardi@utah.gov; Marisa Egbert, (801-538-7277), marisaegbert@utah.gov

C. Process of Setting Minimum Sizing Requirements

This section provides information related to the process of analyzing the annual water use data that are reported by CWSs to DWRi and establishing system-specific minimum source and storage sizing requirements.

The flow chart on the next page summarizes how the raw water use data will be analyzed by the various state agencies and how DDW evaluates the data and establishes the minimum system specific sizing requirements.

Process of Analyzing Water Use Data and Establishing Minimum Sizing Requirements

Data Submission: Water systems certify and report the water use data to Division of Water Rights (DWRi) each year.

↓

Data Review: The water use data are processed and reviewed by DWRi and Division of Water Resources (DWRe). The processed data are forwarded to Division of Drinking Water (DDW).

↓

Process "per ERC" Data: The DDW program calculates and converts the DWRi data to three data types (see D.1):

"Peak Day Demand per ERC" Data
"Average Annual Demand per ERC" Data
"Equalization Storage per ERC" Data

↓

Set Minimum Sizing Requirements: The DDW program evaluates the "per ERC" data, selects a specific value from each "per ERC" data type for further calculation, and checks for anomalies that trigger further evaluation. If no anomalies are identified, the DDW program then applies a "system-specific variation factor" to the selected value and sets the corresponding "per ERC minimum sizing requirement" (see D.4.a through e):

Peak Day Demand per ERC Minimum Sizing Requirement
Average Annual Demand per ERC Minimum Sizing Requirement
Equalization Storage per ERC Minimum Sizing Requirement

↓

Set Customized Minimum Sizing Requirements: If a water system's "per ERC" data trigger further evaluation in the DDW program, a DDW committee reviews the data and selects a specific value from each "per ERC" data type for further calculation. The DDW committee determines a customized "system-specific variation" factor, applies the factor to the selected value, and sets the corresponding "per ERC minimum sizing requirement" (see D.4.f).

↓

Capacity Evaluation: When source/storage capacity evaluation of a water system's current/future needs are needed:

The "Peak Day Demand per ERC Minimum Sizing Requirement" and the "Average Annual Demand per ERC Minimum Sizing Requirement" are used to evaluate the water system's source capacity. (see E.2)

The "Equalization Storage per ERC Minimum Sizing Requirement" is used to evaluate the water system's storage capacity. (see E.3)

D. Methodology of Setting Minimum Sizing Requirements

This section describes in detail the methodology used by DDW to establish system-specific minimum source and storage sizing requirements based on the annual water use data submitted to DWRi by CWSs.

1. The starting point of setting system-specific minimum sizing requirements is to evaluate the reported water use data for the entire water system and translate the data to indicate the source capacity and storage capacity needed for a single residential connection or an equivalent residential connection (ERC).

2. In the DDW program, the first step is to identify whether the reported water use data transferred from DWRi are acceptable for minimum sizing evaluation purpose.

3. The second step is to process the accepted data for conversion to the following "per ERC" data. (Additional information regarding these data types are described in Items 8 through 10 below.)

"Peak Day Demand per ERC" Data = [Peak Day Source Demand] / [Total Number of ERCs]
(in gallons/day)

"Average Annual Demand per ERC" Data = [Average Annual Demand] / [Total Number of ERCs]
(in gallons/year)

"Equalization Storage per ERC" Data = [Average Annual Demand per ERC] / [Operational Days in a Year]
(in gallons)

4. The next step is to analyze the "per ERC" data to set the following system-specific "per ERC minimum sizing requirements":

Peak Day Demand per ERC Minimum Sizing Requirement (in gallons/day) =
["Peak Day Demand per ERC" selected value] × [1 + System-Specific Variability Factor]

Average Annual Demand per ERC Minimum Sizing Requirement (in gallons/year) =
["Average Annual Demand per ERC" selected value] × [1 + System-Specific Variability Factor]

Equalization Storage per ERC Minimum Sizing Requirement (in gallons) =
["Equalization Storage per ERC" selected value] × [1 + System-Specific Variability Factor]

5. The methodology and process of setting system-specific "per ERC minimum sizing requirements" are described in detail below.

a. The DDW program calculates the "per ERC" data by utilizing **at least 3 years of actual water use data**.

b. The **highest value of the 3 (or more) years of data** is selected as a starting point in the DDW program.

c. The DDW program has numerous built-in triggers to identify anomalies and to select candidate water systems for further evaluation. The triggers may be adjusted when incoming data become more accurate, and more data become available in the future.

d. Examples of possible triggers:
    i. Range of "Peak Day Demand per ERC" data from CWSs of similar irrigation water use
    ii. Range of "Average Annual Demand per ERC" data from CWSs of similar irrigation water use
    iii. Variation of CWSs own "Peak Day Demand per ERC" data;
    iv. Variation of CWSs own "Average Annual Demand per ERC" data
    v. Ratio of "Peak Day Source Demand" to "Daily Average of Peak Month"

e. **Water Systems with Data That Do Not Trigger Further Evaluation:**

    The highest of each category will be selected and set for the "per ERC minimum sizing requirement". If a water system chooses to use a "system-specific variability factor", it will be applied to the "per ERC minimum sizing requirement.

f. **Water Systems That Need Further Evaluation:**

    A review committee, consisting of at least 3 DDW Permitting staff, **will evaluate the data and determine the "per ERC minimum sizing requirements."**

    i. The committee analyzes the data with additional considerations (e.g., data variation range, irrigation percentage, "Daily Average of Peak Month" data) and selects specific values for each "per ERC" data type. These specific values will be used for further calculation to set the corresponding "per ERC minimum sizing requirements."
    ii. The committee can determine a customized "system-specific variability" factor. The customized factor is applied on top of the selected values to set the corresponding "per ERC minimum sizing requirements." The customized "system-specific variability" factor is determined on a case-by-case basis.

6. **Example – Setting System-Specific "per ERC Minimum Sizing Requirements**" for a Seasonal Water System Based on Hypothetical Triggers:

Year	Operational Days in the Year	Total Number of ERCs	"Peak Day Demand per ERC" Data (gallons/day)	"Average Annual Demand per ERC" Data (gallons/year)	"Equalization Storage per ERC" Data* (gallons)
2018	183	2,592	1,929	113,525	620
2017	160	2,500	1,748	106,327	665
2016	220	1,300	1,710	152,174	692

* Equalization Storage per ERC = [Average Annual Demand per ERC] ÷ [Operational Days]

Evaluate 3 years of "Peak Day Demand per ERC" data

(1) The highest value of 3-year "Peak Day Demand per ERC" data (from 2016 to 2018) is 1,929 gallons/day.
(2) The "Peak Day Demand per ERC" of 1,929 is within the default range (*based on a hypothetical default range of 1,000 to 3,000 gallons/day in the automated DDW program for the water system group that serves irrigation water to 80% to 100% of service connections*) → not triggered.
(3) The ratios of "Peak Day Demand" to "Daily Average of Peak Month" data for 2016 – 2018 are 1.2, 1.3, and 1.25 (not shown in the table above). These values are within the default range (*based on a hypothetical default range of 1.1 to 1.5 in the automated DDW program*) → not triggered.
(4) This system has chosen to use a "system-specific variability factor" of 12.8%. [1,929 gallons/day × (1 + 12.8%) = 2,176 gallons/day]
(5) The DDW program sets the system-specific "Peak Day Demand per ERC minimum sizing requirement" at 2,176 gallons/day for this water system.

Evaluate 3 years of "Average Annual Demand per ERC" data

(1) The highest value of 3-year "Average Annual Demand per ERC" data is 152,174 gallons/year.
(2) The "Average Annual Demand per ERC" value of 152,174 is within the default range (*based on a hypothetical range in the automated DDW program for the water system group that serves irrigation water to 80% to 100% of service connections*) → not triggered.
(3) The system chose to use a "system-specific variability factor" of 20% on top of the highest value of the 3-year data (152,174 gallons/year). [152,174 gallons/year × (1 + 20%) = 182,609 gallons/year]
(4) The DDW review committee sets the system-specific "Average Annual Demand per ERC minimum sizing requirement" at 182,609 gallons/year for this water system.

Evaluate 3 years of "Equalization Storage per ERC" data

(1) The highest value of 3-year "Equalization Storage per ERC" data is 692 gallons.
(2) The "Storage Equalization per ERC" data are derived from the "Average Annual Demand per ERC" data. Apply the same "system-specific variability" factor that was applied to the "Average Annual Demand per ERC minimum sizing requirement" in Step 12 above to calculate the "Equalization Storage per ERC minimum sizing requirement."
(3) Apply the same customized "system-specific variability factor" (20%) to the highest value of the 3-year "Equalization Storage per ERC" data (692 gallons). [692 gallons × (1 + 20%) = 830 gallons]
(4) The DDW review committee sets the system-specific "Equalization Storage per ERC minimum sizing requirement" for this system at 830 gallons.

7. The **"Peak Day Demand per ERC" data** and the **"Average Annual Demand per ERC"** data are typically calculated **using the data related to retail connections only** (including residential connections and non-residential ERCs).

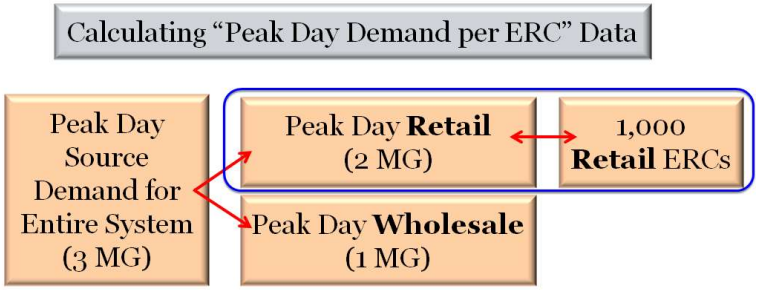
8. **Calculating "Peak Day Demand per ERC" Data**

$$\textbf{"Peak Day Demand per ERC" Data} = \frac{\text{[Peak Day Source Demand] (in gallons/day)}}{\text{[Total Number of ERCs]}}$$

a. The value of "Peak Day Source Demand" used for calculating the "Peak Day Demand per ERC" data **includes the source data for supplying retail service connections** (i.e., residential and non-residential connections), and does not include the source data for supplying water to wholesale connections.

b. The value of "Total Number of ERCs" used for calculating the "Peak Day Demand per ERC" data **includes the retail service connections only** (including residential and non-residential ERCs). The number of wholesale connections supplying water to other regulated water systems does not need to be converted to ERCs and must not be included in the "Total Number of ERCs."

c. **Example – Calculating "Peak Day Demand per ERC" Data Using the Data Related to Retail Services**



(1) In the example above, a water system's "Peak Day Source Demand" is 3 million gallons (MG) during the peak day of water consumption in a specific year.
(2) During this year's peak day, the water system's Peak Day Source Demand data (3 MG) consists of:
    - Delivering 2 MG of water to retail connections (i.e., retail demand), and
    - Delivering 1 MG of water to other water systems (i.e., wholesale demand).
(3) The water usage of the retail connections in this water system (including residential and non-residential connections) is estimated to equal a total of 1,000 equivalent residential connections (ERCs) this year.
(4) To calculate the "Peak Day Demand per ERC" data for this year:
    - Retail portion of the "Peak Day Source Demand" data (2 MG) is used.
    - The estimated "Total Number of ERCs" (1,000 ERCs) is used.
(5) This water system's "Peak Day Demand per ERC" data for this specific year is calculated to be 2,000 gallons/day for each ERC.
[2,000,000 gallons/day ÷ 1,000 ERCs = 2,000 gallons/day for each ERC]

9. **Calculating "Average Annual Demand per ERC" Data**

"Average Annual Demand per ERC" Data (in gallons/year) = [Average Annual Demand] / [Total Number of ERCs]

a. The "Average Annual Demand" value used for calculating the "Average Annual Demand per ERC" data **includes only the source data for supplying retail service connections** (i.e., residential and non-residential connections), and does not include the demand data from wholesale connections.

b. The value of "Total Number of ERCs" used for calculating the "Average Annual Demand per ERC" data **includes the retail service connections only** (including residential and non-residential ERCs). The number of wholesale connections supplying water to other regulated water systems does not need to be converted to ERCs and must not be included in the "Total Number of ERCs."

10. **Calculating "Equalization Storage per ERC" Data**

"Equalization Storage per ERC" Data (in gallons) = [Average Annual Demand per ERC] / [Operational Days in a Year]

a. Evaluate the "Equalization Storage per ERC" data. Select a value for further calculation to set the system-specific "Equalization Storage per ERC minimum sizing requirement."

b. The "Average Annual Demand per ERC" data used in the calculation are **based on the data related to retail connections only** (i.e., residential and non-residential service connections).

c. The number of "Operational Days in a Year" is calculated **based on the starting date and the ending date of the operating season**. An accurate number of days a water system is in operation should be used in the calculation to capture accurate "Equalization Storage per ERC" data. In some cases, a customized value of "Operational Days in a Year" may be used in the calculation (if accepted by DDW).

E. Source and Storage Capacity Evaluation

1. The following "per ERC minimum sizing requirements" are used to calculate a water system's source and storage sizing requirements.

(1) Peak Day Demand per ERC Minimum Sizing Requirement	**Source Sizing**
(2) Average Annual Demand per ERC Minimum Sizing Requirement	
(3) Equalization Storage per ERC Minimum Sizing Requirement	**Storage Sizing**

These "per ERC minimum sizing requirements" are the basis of evaluating whether a water system's capacity meets the minimum required source and storage sizing for current needs and/or projected growth.

2. **Source Capacity Evaluation**

   a. Water sources shall be physically capable of meeting both the **peak day water demand** and the **average yearly demand**. [R309-510-7]

   b. The "**Peak Day Demand per ERC Minimum Sizing Requirement**" and the "**Average Annual Demand per ERC Minimum Sizing Requirement**" are used to evaluate whether a water system's current source capacity can meet the minimum source sizing requirements, as well to predict the source capacity that will be needed to meet future needs for new projects or developments.

   c. The following equations show how to calculate the **minimum <u>source</u> capacity** needed to meet the "Peak Day Source Demand" and the "Average Annual Demand" of the retail connections in a water system:

Source Capacity Needed to Meet the Peak Day Source Demand (in gallons/day) = [Peak Day Demand per ERC Minimum Sizing Requirement] × [Total Number of ERCs]

Source Capacity Needed to Meet the Average Annual Demand (in gallons/year) = [Average Annual Demand per ERC Minimum Sizing Requirement] × [Total Number of ERCs]

3. **Storage Capacity Evaluation**

   a. Water systems shall provide water storage for **equalization**, **fire suppression**, and **emergencies**. [R309-510-8]

   b. The following equation shows how to calculate the **minimum storage capacity** needed to cover the three components mentioned above in a.

Total Storage Capacity Required (in gallons) =
[Equalization Storage] + [Fire Suppression Storage] + [Emergency Storage (optional)]

   c. Drinking water systems' storage capacity includes three components:

      (1) **Equalization Storage**: the equalization storage requirement is set at a level equivalent to the average day demand for indoor and outdoor water uses in a water system.

Equalization Storage Required (in gallons) =
[Equalization Storage per ERC Minimum Sizing Requirement] × [Total Number of ERCs]

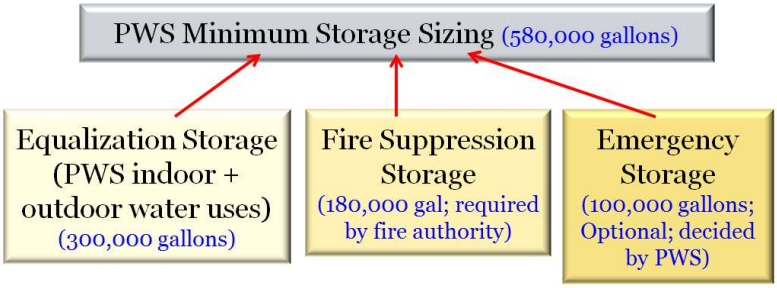
      (2) **Fire Suppression Storage**: as determined by local fire code officials

Fire Suppression Storage Required by Local Fire Code Authority (in gallons) =
[Required Fire Flow (in gallons per minute)] × [Required Duration (in minutes)]

      (3) **Emergency Storage** (in gallons): this is optional and is determined by individual water systems. Water systems will not need to report the Emergency Storage volume to DWRi during the annual water use data reporting. This number is needed from water systems only when system storage capacity is evaluated by DDW.

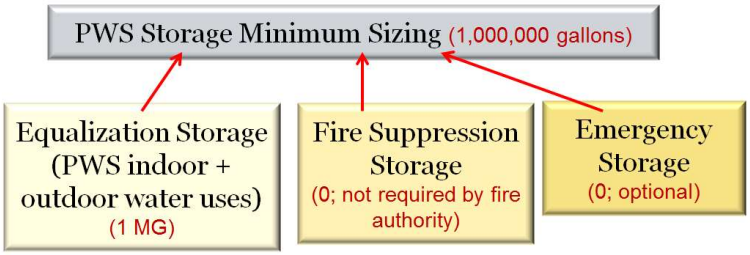
   d. Below are two examples of calculating the storage capacity needed for drinking water systems.

Example 1 – Calculating Minimum Storage Capacity for Equalization, Fire Suppression and Emergency



(1) The ABC water system's system-specific "Equalization Storage per ERC minimum requirement" is set at 400 gallons. The ABC water system has a total of 750 equivalent residential connections (ERCs). This system is required to provide 300,000 gallons for equalization storage.
[400 gallons/ERC × 750 ERCs = 300,000 gallons]
(2) The local fire official requires the ABC water system to supply at least 1,500 gallons per minute (gpm) of fire flow for at least 120 minutes. This system is required to have 180,000 gallons of water storage for fire suppression.
[1,500 gallons/minute × 120 minutes = 180,000 gallons]
(3) Due to lack of desired redundancy in system configuration for a specific service area, the ABC water system chooses to have additional 100,000 gallons of storage to handle emergency or unexpected incidents.
(4) This water system's required storage capacity is estimated to be at least 580,000 gallons. [300,000 + 180,000 + 100,000 = 580,000 gallons]

Example 2 – Calculating Minimum Storage Capacity for Equalization Only



(1) The XYZ water system's system-specific "Equalization Storage per ERC minimum requirement" is 400 gallons for each ERC. The XYZ water system has a total of 2,500 ERCs. The XYZ water system is required to provide 1,000,000 gallons for equalization storage.
[400 gallons/ERC × 2,500 ERCs = 1,000,000 gallons]
(2) The fire suppression system for the XYZ water system's service area is connected to an irrigation company. The XYZ water system is not required to provide fire

suppression storage by fire code official, and there are no fire hydrants connecting to the XYZ distribution system.

(3) The XYZ water system has reliable sources and adequate redundancy design. It chooses not to have additional water storage for emergencies.

(4) This water system's required storage capacity is 1,000,000 gallons as a minimum. [1,000,000 + 0 + 0 = 1,000,000 gallons]

IV. Submitting an Engineering Study to Set Minimum Sizing Requirements

Setting accurate system-specific minimum sizing requirements are critical for evaluating a water system's overall capacity and/or estimating projected capacity associated with specific projects.

Per Utah Code 19-4-114, the information necessary for Division of Drinking Water (DDW) to set the system-specific requirements may be based on:

1. Water use data submitted by water systems to Division of Water Rights (DWRi) per Utah Code 19-4-104(1)(c)(iv), or
2. An engineering study or at least 3 years of historical water use data.

This chapter (Chapter IV) provides information related to the second option, i.e., using engineering studies to establish system-specific minimum source and storage sizing requirements for Community Water Systems (CWSs). The previous chapter (Chapter III) addresses the first option.

A. What to Include in an Engineering Study

Utah Code 19-4-114(1)(c) allows CWSs serving over 3,300 people to meet the March 1, 2019, deadline by submitting an engineering study to DDW, in lieu of using actual water use data submitted to Division of Water Rights (DWRi), to establish system-specific minimum sizing requirements. For example, **if a CWS has water use data that are not representative of future use or does not have actual water use data** stated in Utah Code 19-4-104(6)(a), the water system may submit an engineering study with supporting information and propose alternative minimum sizing requirements to DDW.

The engineering study should include all supporting information, assumptions and justifications used in the study to justify an alternative minimum sizing requirement. **In some cases, DDW may require the study be prepared by a professional engineer if engineering determination needs to be included in the study.**

An example of a possible approach is to rely on comparable water use data from other water system(s) that are similar in lot size, land use, precipitation pattern, etc., to meet the March 1, 2019, deadline of submitting necessary information to set system-specific sizing requirements. This approach may be allowed temporarily until a water system has reported the required actual data reporting to DWRi annually for three years. At that time, this water system's minimum sizing requirements will be reevaluated based on the reported actual water use data.

As a minimum, an engineering study should include the following:

1. **Minimum source sizing proposed by the water system**

Example 1 – Using Comparable Data from Other Systems with Justifications

A water system wishes to establish its minimum sizing requirements based on comparable water use data from other water system(s). It may submit the following information to DDW:

a. Estimated Peak Day Source Demand (for entire water system)
b. Estimated Average Annual Demand (for entire water system)
c. Total Number of ERCs (for entire water system)
d. Estimated quantity of Non-revenue Water (for entire water system)
e. Proposed Peak Day Source Demand per ERC
f. Proposed Average Annual Source Demand per ERC
g. Estimated Number of Operational Days in a Year
h. Justification of comparability of data selected to represent this water system

Example 2 – Using Historical Data with Justifications

A water system may present the following actual water use data with supporting information for setting system-specific minimum sizing requirements:

a. Peak Day Source Demand (for entire water system) — at least 1 year of data
b. Average Annual Demand (for entire water system) — at least 3 years of data
c. Total Number of ERCs — at least 3 years of data
d. **Peak Month Source Demand** (for entire water system) — at least 3 years of data
e. **Daily Average of Peak Month Source Demand** (for entire water system) — at least 3 years of data *[Note: If only one data point is provided for peak day source demand, the daily average of the peak month demand data should be compared to the peak day demand per ERC proposed by the water system]*
f. Quantity of Non-revenue Water — at least 1 year of data
g. Number of Operational Days in a Year — at least 3 years of data
h. **Proposed Peak Day Source Demand per ERC**
i. **Proposed Average Annual Source Demand per ERC**
j. Justification of adequacy and comparability of data presented

2. **Equalization storage sizing proposed by the water system**

a. Equalization Storage per ERC (in gallons)
b. Fire Suppression Storage in gallons (if applicable)
c. Emergency Storage in gallons (if applicable)

3. **Other Supporting information, assumptions and justifications used in the study**

B. Guidance on Preparing an Engineering Study

This section provides guidance to CWSs that intend to prepare an engineering study, in lieu of using the actual water use data stated in Utah Code 19-4-104(6)(a), to set system-specific minimum sizing requirements.

1. CWSs should examine the water use data currently on hand and determine the following:
    a. How many years of water use data are available;
    b. Whether the quality of existing data can meet the water use data required by Utah Code 19-4-104(6)(a), i.e., "Peak Day Source Demand", "Average Annual Demand", "Number of Equivalent Residential Connections", and "Quantity of Non-revenue Water";
    c. Whether long-term historical data (at least 3 years) that can be used for extrapolation to set system-specific minimum sizing requirements with reasonable assumptions are available; and
    d. Whether or not technical assistance from a consultant that is experienced in analyzing water use data and/or preparing an engineering study for setting system-specific minimum sizing requirements is needed in order to meet the March 1, 2019, deadline.

2. Prepare to begin collecting required water use data in 2018 and begin reporting the 2018 data to the DWRi **by March 1, 2019**. Continue to collect and report the above data to DWRi annually.

3. Collection and reporting of annual water use data are required of all CWSs serving 500 people or more. Please note that the annual data reporting requirement is still applicable even if a water system submits an engineering study to meet the March 1, 2019, deadline.

4. If your water system has **at least 3 years of good-quality, reliable water use data specified in Utah Code 19-4-104(6)(a)** including some amount of "Peak Day Source Demand," "Average Annual Demand," "Total Number of ERCs," and "Quantity of Non-Revenue Water" data, prepare to submit the data by March 1, 2019. Read Chapter III of this document thoroughly before compiling the data.

5. If your water system has **reliable long-term historical water use data that do not fully meet the terms described in Utah Code 19-4-104(6)(a)** but, with reasonable assumptions, may be sufficient to establish system-specific minimum sizing requirements, plan on preparing **an engineering study for submission to DDW by March 1, 2019.** The engineering study should clearly identify the rationales and assumptions, and include the supporting data. Read both Chapters III and IV of this document thoroughly before preparing the engineering study.

6. If your water system **does not have reliable or sufficient water use data** to justify setting system-specific minimum sizing requirements, The Division recommends that you contact a consultant experienced in water use data collection and water system sizing as soon as possible. An experienced consultant can help you identify possible approaches to prepare

an engineering study and your water system's equipment upgrade needs. Read this Chapter thoroughly before preparing the submission to DDW.

7. **Metering/SCADA Equipment**
   Immediately start to evaluate your current metering equipment (and SCADA equipment/contract) and identify the need to install or upgrade the equipment to enable your water system to collect the required data.

   If your water system's existing equipment cannot measure, collect, or record the water use data required in Utah Code 19-4-104(6)(a):
   a. Plan to install or upgrade the necessary equipment (e.g., smart meter, flow meter, staff gauge, flow measuring weir, tank level indicator) immediately if possible, or make alternative plans to obtain the Peak Day Source Demand data on a temporary basis (e.g., manual read by the stopwatch and bucket method, manual reading of a staff gauge or weir).
   b. DDW advises against hastily reporting speculative water use data to fulfill the annual reporting requirement. Reporting inaccurate data will lead to erroneous sizing of drinking water infrastructure and result in public health risk.
   c. Consider the option of entering into a corrective action agreement with DDW immediately, which will establish a compliance schedule and allow additional time for implementation.
   d. Consider adjusting water rates to build up the financial capability to upgrade and replace metering/SCADA equipment.
   e. Contact DDW and/or other funding agencies to seek funding assistance in upgrading metering/SCADA equipment.

8. Appendix D of this document provides a web link for a technical report, Metering Equipment Alternatives and Analysis, by Bowen Collins & Associates and Hansen Allen & Luce. This report contains detailed information regarding AMI Technologies. It also contains a template for metering equipment technical specifications that can be useful to water systems or consultants if they intend to install or upgrade equipment to gather the required water use data. The Division recommends reading this report carefully before starting meter installation or upgrade projects.

9. For funding assistance in installing and upgrading the metering or SCADA equipment, please contact:

   - Division of Drinking Water
     Michael Grange — (801-536-0069), mgrange@utah.gov

   - Division of Water Resources
     Shalaine DeBernardi, (801-652-1668), shalainedebernardi@utah.gov
     Marisa Egbert, (801-538-7277), marisaegbert@utah.gov

C. Methodology for Setting Minimum Sizing Requirements

This section addresses the methodology used to establish the "per ERC minimum sizing requirements" for source and storage **when a CWS submits an engineering study**, in lieu of actual water use data stated in Utah Code 19-4-104(6)(a).

1. **Data Calculations** (see Chapter III Section D)

"Peak Day Demand per ERC" Data = [Peak Day Source Demand] (in gallons/day) / [Total Number of ERCs]

"Average Annual Demand per ERC" Data = [Average Annual Demand] (in gallons/year) / [Total Number of ERCs]

"Equalization Storage per ERC" Data = [Average Annual Demand per ERC] (in gallons) / [Operational Days in a Year]

2. **Determining Source Minimum Sizing Requirements**

   a. See Chapter III Section D of this document.

   b. If the engineering study provides only one data point for peak day source demand for the water system, DDW will require **evaluation of the "Daily Average of Peak Month Source Demand" data for each of the three years submitted, and comparison to the water system's corresponding "Peak Day Source Demand" data**. This additional evaluation is to ensure that the proposed "Peak Day Demand per ERC" value is reasonable and sufficiently representative. DDW may require additional supporting information if there are concerns.

3. **Determining Storage Minimum Sizing Requirement**

   See Chapter III Section D.

V. Division of Drinking Water's Interpretation of Utah Code 19-4 Revisions

This chapter describes the interpretation and implementation of the 2018 revisions to Utah Code 19-4 and the 2023 revisions to Utah Code 19-4-114 by the Division of Drinking Water (DDW)

1. DDW's plan review requirement applies to the review and approval of **drinking water infrastructure** owned and operated by public drinking water systems. The review and approval of **subdivision plats** are handled by local authorities, not by DDW.

2. Utah's minimum sizing requirements for public water systems (outlined in the current R309-510 rule and in the future system-specific minimum sizing requirements) are intended to assure **adequate sizing of drinking water infrastructure** during the DDW review of **design and construction** of public drinking water projects (including water sources, storage tanks, pipes, etc.).
    a. The DDW minimum sizing requirements are not intended to regulate, guide, or affect **impact fees**. Impact fee assessment is regulated by Utah Code 11-36a (Title 11, Chapter 36a, Impact Fees Act), which is not administered by DDW.
    b. The DDW minimum sizing requirements are not intended to regulate or affect **water rights** requirements. The Division of Water Rights (DWRi) is the regulatory authority for water rights issues.

3. **Utah Administrative Code R309-500-4(1) and R309-500-7** A Community Water System (CWS) must **comply with plan review requirements**, i.e., submission of plans and specifications for public drinking water projects for DDW review per R309-500-4(4)(1), **unless** it has obtained water line installation approval per R309-500-7. The requirements are not affected by a water system's decision to submit the newly required water use data to DDW or submit an engineering study instead for setting system-specific minimum sizing requirements.

4. **Utah Code 19-4-104(1)(a)(iv)(A)** DDW will "establish fines and penalties" for a CWS that fails to comply with the water use data reporting requirements through existing enforcement procedures.

5. **Utah Code 19-4-104(1)(a)(iv)(B)** If a CWS fails to comply with the annual water use data reporting requirements in 19-4-104(1)(c)(iv), DDW encourages the CWS to enter into a corrective action agreement to comply with the requirements.
    a. DDW will include a reporting deficiency (with deficiency points) in the proposed revision to R309-400 (IPS rule) for a water system's failure to comply with annual water use data reporting to Division of Water Rights (DWRi).
    b. If a CWS serving over 3,300 people fails to submit to DDW by March 1, 2019, "the information necessary to establish the system-specific standards" (e.g., engineering study with supporting information) per 19-4-114(1)(c), DDW will assess administrative deficiency points to the water system for failure to submit the necessary information by March 1, 2019, to establish the system-specific sizing requirements per 19-4-114(1)(c).

6. **Utah Code 19-4-114(1), (2), and (3)** The current statewide minimum sizing standards in R309-510 stay in effect until system-specific sizing requirements are established after March 1, 2019, for CWSs serving over 3,300 people and by October 1, 2023, for CWSs serving 500 to 3,300 people. For CWSs serving less than 500 or for the transient non-community and non-transient non-community systems will be included as the water use data is available.

7. **Utah Code 19-4-114(1)(a) and (c)**

    a. **"Substantial addition to or alteration"** of CWSs serving over 3,300 persons is defined below:
        i. Projects that add 10% or more equivalent residential connections (ERCs) or population to the existing ERCs or population are considered "substantial addition or alteration."
        ii. Projects that increase a water system's source, storage and distribution capacities are not considered "substantial addition," for example, adding a new source or a new storage tank, upgrading existing undersized piping, etc.
        iii. Projects that result in a decrease in a water system's source, storage and distribution capacities are considered "substantial alteration," for example, decreasing well pump capacity, demolishing an existing tank, etc.

    b. If a CWS serving over 3,300 people submits plans for substantial addition or alteration and **also submits "the information necessary to establish the system-specific sizing standards,"** DDW will establish the system-specific sizing requirements and complete the plan review based on the new system-specific sizing requirement.

    c. **Before March 1, 2019**, if a CWS serving over 3,300 people submits plans for substantial addition or alteration **without submitting "information necessary to establish the system-specific sizing standards"**— DDW will proceed completing the plan review based on the current statewide sizing standards and include a disclaimer paragraph in the Plan Approvals and/or Operating Permits to address possible impact to PWS when system-specific sizing standards are in place in the future.

    d. **After March 1, 2019**, if a CWS serving over 3,300 people submits plans for substantial addition or alteration **without submitting "information necessary to establish the system-specific sizing standards"**:
        i. DDW will notify the CWS that the **plans for substantial addition or alteration** are incomplete and the review cannot be completed without the required "information necessary to establish the system-specific sizing standards."
        ii. This approach will be in place until DDW has received 3 years of data from DWRi. At that point, DDW will establish system-specific minimum sizing requirements based on 3 years of actual water data reported to DWRi by the water system, and at that time complete the review of the submitted plans for

substantial addition or alteration based on system-specific minimum sizing requirements.

iii. If a CWS proceeds with **construction of unapproved projects**, DDW will issue a 50-point significant deficiency to the water system. In addition, DDW has the authority to impose a cost recovery fee for each project to water systems that construct public drinking water projects without DDW approval.

iv. **DDW review of plans unrelated to substantial addition or alteration** — if a CWS serving over 3,300 people fails to submit "information necessary to establish the system-specific sizing standards" that are acceptable to DDW, DDW will proceed with review of plans that are unrelated to "substantial addition or alteration" only.

e. If a CWS serving over 3,300 people submits plans for a substantial addition or alteration and does not have at least 3 years of actual water use data for setting system-specific sizing requirements, per Utah Code 19-4-114(1)(b), in lieu of 3 years of water use data described in 19-4-104(6)(a), the CWS may submit an engineering study with supporting information to DDW. If the engineering study is accepted by DDW, DDW will set the system-specific sizing requirements accordingly and complete the plan review based on the new system-specific sizing requirements.

8. **Utah Code 19-4-114(1)(b)** DDW may accept engineering studies or comparable water use data, even if the submitted data do not meet the criteria for annual data reported to DWRi or the number of data points mentioned in 19-4-104(1)(c)(iv), for setting system-specific sizing requirements. The historical data submitted to DDW should at least have a similar level of accuracy and/or data quantity as the annual data reported to DWRi.

9. **Utah Code 19-4-114(1)(b)(i) and (ii)(B)**
   a. DDW will set system-specific sizing standards when a CWS submits acceptable information (e.g., engineering study) sufficient to set system-specific sizing standards.
   b. DDW will not set system-specific sizing standards if sufficient acceptable information (engineering study) is not submitted to DDW.

10. **Utah Code 19-4-114(1)(c)** requires all CWSs serving over 3,300 people to submit "information necessary to establish the system-specific standards" to DDW by March 1, 2019.

11. **Utah Code 19-4-114(2)(a)**
    a. The statute states that the director shall establish system-specific source and storage minimum sizing requirements for CWSs serving between 500 and 3300 people by October 1, 2023.

    b. For CWSs serving between 500 and 3,300 people, DDW will establish system-specific sizing requirements when DDW has received sufficient data from DWRi, or when a CWS submits acceptable information (e.g., an engineering study) for

setting system-specific sizing requirements, which is allowed by the current R309-510-5 even if it's prior to October 1, 2023.

12. **Utah Code 19-4-114(4)(a)**
    The statute states that the director shall establish a schedule to transition CWSs serving fewer than 500 people from statewide to system-specific sizing standards. It does not state how the schedule must be established. DDW will determine whether the transition schedule needs to be established by policy or by rule.

13. **Utah Code 19-4-114(4)(b)**
    The statute states that the director shall establish minimum sizing standards for non-community water systems. Tentatively, the existing minimum sizing tables (Tables 510-1, 2, 3, and 4) in R309-510 will remain in effect for non-community water systems. In the future, DDW will evaluate the data and determine whether the numbers in these tables can be updated.

14. **Utah Code 19-4-114(7)**
    The 2023 update to the statute states that upon the request of a wholesale water supplier and their receiving water systems, the director may establish a regional source and storage sizing standard. The information used to set this standard shall be based on actual metered water use data. This will be handled on a case-by-case basis with each wholesale water supplier.

15. **Utah Code 19-4-114(8)**
    The 2023 update to the statute states that the director may adjust system-specific sizing standards based on enforceable water conservation measures consistent with regional conservation goals.

VI. Division Policies to Aid in Finalizing System-Specific Sizing Standards

A. Safe Yields to use for Source Capacities for existing water sources

When a water system is missing well safe yields, spring yields or consecutive connection capacity information, the following protocol will be used to evaluate a water system's capacity using the System-Specific Minimum-Sizing Standards:

1. Well Safe Yield:
    a. For existing wells, prior to 1993, that are missing constant rate pump test data to establish a safe yield that complies with Division Rules, the following may be considered:
        i. Current equipped pumping rate can be used.
        ii. Conduct a 24-hour constant rate test and the Division will set the safe yield based on ⅔ of the pumping rate used in the test.
    b. If the water system cannot provide current equipped pumping rate, the source will be assigned a safe yield of zero in SDWIS, and the applicable source deficiency points will be issued.

2. Spring Yield:
    a. Submit 3 years of monthly historical flow data, when the spring is accessible, and the Division will set the spring yield at the 25th percentile.
    b. If historical data is not available, the Division may use DWRi's data to calculate the 25th percentile based on 3 years of recorded spring flow. Depending on the location of data collection, this may not account for overflow volumes.
    c. If DWRi's data does not capture the full spring flow, the System can begin collecting monthly spring flow data and submit 3 years of monthly historical flow data, when the spring is accessible, and the Division will set the spring yield typically at the 25th percentile of the spring flow data spring yield at the 25th percentile.

3. Consecutive Connections:
    a. The following options will be considered:
        i. The maximum allowed flow based on a contract from the wholesale system
        ii. The maximum metered day of flow from the wholesale system.
        iii. The maximum hydraulic capacity of the metered connection(s).
        iv. The Division will enter the sum of all interconnections for one consecutive connection in SDWIS as Maximum Daily Purchase Rate (MDPR) in gallons per minute (gpm).

B. Water Systems That Supply Raw Water to Industrial Water Users.

This section applies to water systems that utilize a treatment plant (either organic or inorganic treatment) and provide water prior to treatment. The source capacity for water sources that are treated is the design flow of the treatment plant. This does not apply to water systems that share water sources with each other as those are tracked as wholesale connections in the Division of Water Rights.

1. The water system will need to keep track of their monthly flows, and peak day flows if possible, to the industrial user that uses raw water.
2. The water system will need to submit this data to the Division and will calculate the water use standards manually.
3. The Division will remove the raw water sent to the industrial user(s) from the annual water use and recalculate the ERCs.
4. If the peak day water use of the industrial water user(s) was provided, the Division will also remove this amount from the reported peak day demand.
5. Division staff will take the finalized calculated numbers and recalculated ERCs and enter them into the water use module as final numbers and finalize the standard.

Appendix A

Utah Code 19-4-104

(Effective July 21, 2018)

& 19-4-114

(Effective May 3, 2023)

19-4-104. Powers of board.

(1)

(a) The board may make rules in accordance with Title 63G, Chapter 3, Utah Administrative Rulemaking Act:

(i) establishing standards that prescribe the maximum contaminant levels in any public water system and provide for monitoring, record-keeping, and reporting of water quality related matters;

(ii) governing design, construction, operation, and maintenance of public water systems;

(iii) granting variances and exemptions to the requirements established under this chapter that are not less stringent than those allowed under federal law;

(iv) protecting watersheds and water sources used for public water systems;

(v) governing capacity development in compliance with Section 1420 of the federal Safe Drinking Water Act, 42 U.S.C. Sec. 300f et seq.; and

(vi) for a community water system failing to comply with the reporting requirements under Subsections (1)(c)(iv) and (v):

(A) establishing fines and penalties, including posting on the division's web page those community water systems that fail to comply with the reporting requirements; and

(B) allowing a community water system, in lieu of penalties established under Subsection (1)(a)(vi)(A), to enter into a corrective action agreement with the division that requires compliance and establishes a compliance schedule approved by the director.

(b) The board may:

(i) order the director to:

(A) issue orders necessary to enforce the provisions of this chapter;

(B) enforce the orders by appropriate administrative and judicial proceedings; or

(C) institute judicial proceedings to secure compliance with this chapter;

(ii)

(A) hold a hearing that is not an adjudicative proceeding relating to the administration of this chapter; or

(B) appoint hearing officers to conduct a hearing that is not an adjudicative proceeding; or

(iii) request and accept financial assistance from other public agencies, private entities, and the federal government to carry out the purposes of this chapter.

(c) The board shall:

(i) require the submission to the director of plans and specifications for construction of,

substantial addition to, or alteration of public water systems for review and approval by the board before that action begins and require any modifications or impose any conditions that may be necessary to carry out the purposes of this chapter;

(ii) advise, consult, cooperate with, provide technical assistance to, and enter into agreements, contracts, or cooperative arrangements with state, federal, or interstate agencies, municipalities, local health departments, educational institutions, and others necessary to carry out the purposes of this chapter and to support the laws, ordinances, rules, and regulations of local jurisdictions;

(iii) develop and implement an emergency plan to protect the public when declining drinking water quality or quantity creates a serious health risk and issue emergency orders if a health risk is imminent;

(iv) require a community water system serving a population of 500 or more to annually collect accurate water use data, described in Subsection (6), and annually report that data to the Division of Water Rights;

(v) require a certified operator, or a professional engineer performing the duties of a certified water operator, to verify by certification or license number the accuracy of water use data reported by a public water system, including the data required from a community water system under Subsection (1)(c)(iv); and

(vi) meet the requirements of federal law related or pertaining to drinking water.

(2)

(a) The board may adopt and enforce standards and establish fees for certification of operators of any public water system.

(b) The board may not require certification of operators for a water system serving a population of 800 or less except:

(i) to the extent required for compliance with Section 1419 of the federal Safe Drinking Water Act, 42 U.S.C. Sec. 300f et seq.; and

(ii) for a system that is required to treat its drinking water.

(c) The certification program shall be funded from certification and renewal fees.

(3) Routine extensions or repairs of existing public water systems that comply with the rules and do not alter the system's ability to provide an adequate supply of water are exempt from the provisions of Subsection (1)(c)(i).

(4)

(a) The board may adopt and enforce standards and establish fees for certification of persons engaged in administering cross connection control programs or backflow prevention assembly training, repair, and maintenance testing.

(b) The certification program shall be funded from certification and renewal fees.

(5) A board member may not speak or act for the board unless the board member is authorized by a majority of a quorum of the board in a vote taken at a meeting of the board.

(6)

(a) The water use data required to be collected in Subsection (1)(c)(iv) shall include peak day source demand, average annual demand, the number of equivalent residential connections for retail service, and the quantity of non-revenue water.

(b) The division may, by rule, establish:

(i) other types of water use data required to be collected in addition to that listed in Subsection (6)(a); and

(ii) alternative methods for calculating the water use data listed in Subsection (6)(a).

Repealed and Re-enacted by Chapter 5, 2018 Special Session 2

Effective 7/21/2018

19-4-114. Source and storage minimum sizing requirements for public water systems.

(1)

(a) Except as provided in Subsection (1)(b) and upon submission of plans for a substantial addition to or alteration of a community water system, the director shall establish system-specific source and storage minimum sizing requirements for a community water system serving a population of more than 3,300 based on at least the most recent three years of a community water system's actual water use data submitted in accordance with Subsections 19-4-104(1)(c)(iv) and (v).

(b) If the water use data required under Subsection 19-4-104(1)(c)(iv) is not available to the division, or if the community water system determines that the data submitted does not represent future system use, the director may establish source and storage minimum sizing requirements for the community water system based on:

(i) an engineering study submitted by the community water system and accepted by the director; or

(ii) at least three years of historical water use data that is:

(A) submitted by the community water system; and

(B) accepted by the director.

(c) A community water system serving a population of more than 3,300 shall provide the information necessary to establish the system-specific standards described in this Subsection (1) by no later than March 1, 2019.

(2)

(a) By no later than October 1, 2023, and except as provided in Subsection (2)(b), the director shall establish system-specific source and storage minimum sizing requirements for a community water system serving a population of between 500 and no more than 3,300 based on at least the most recent three years of a community water system's actual water use data submitted in accordance with Subsections 19-4-104(1)(c)(iv) and (v).

(b) If the water use data required under Subsection 19-4-104(1)(c)(iv) is not available to the division, or if the community water system determines that the data submitted does not represent future system use, the director may establish source and storage minimum sizing requirements for the community water system based on:

(i) an engineering study submitted by the community water system and accepted by the director; or

(ii) at least three years of historical water use data that is:

(A) submitted by the community water system; and

(B) accepted by the director.

(c) A community water system serving a population of between 500 and no more than 3,300 shall provide the information necessary to establish system-specific standards described in this Subsection (2) by no later than March 1, 2023.

(3) The director shall establish system-specific source and storage minimum sizing requirements for a community water system serving a population of fewer than 500 based on:

(a) at least the most recent three years of a community water system's actual water use data submitted to the division and accepted by the director;

(b) an engineering study submitted by the community water system and accepted by the director;

(c) standards, comparable to those of established community water systems, as determined by the director; or

(d) relevant information, as determined by the director.

(4) The director shall:

(a) for community water systems described in Subsection (3), establish a schedule to transition from statewide sizing standards to system-specific standards;

(b) establish minimum sizing standards for public water systems that are not community water systems;

(c) provide for the routine evaluation of changes to the system-specific standards; and

(d) include, as part of system-specific standards, necessary fire storage capacity in accordance with the state fire code adopted under Section 15A-1-403 and as determined by the local fire code official.

(5) The director may adjust system-specific sizing standards, established under this section for a public water system, based on information submitted by the public water system addressing the effect of any wholesale water deliveries or other system-specific conditions affecting infrastructure needs.

(6) A wholesale water supplier is exempt from this section if the wholesale water supplier serves:

(a) a total population of more than 10,000; and

(b) a wholesale population that is 75% or more of the total population served.

(7) Upon request of a wholesale water supplier and the community water systems receiving water from the wholesale water supplier, the director may establish regional source and storage minimum sizing standards for community water systems receiving water from the wholesale water supplier using actual water use data submitted by the wholesale water supplier and the community water systems served by the wholesale water supplier.

(8) The director may adjust system-specific sizing standards established under this section for a public water system based on adopted enforceable water conservation measures that are consistent with regional water conservation goals adopted pursuant to Subsection 73-10-32(2) (d)(ii)(A) or (B).

Amended by Chapter 238 2023 General Session

Effective 5/3/2023

Appendix B

A Review of the Division of Drinking Water's Source Sizing Requirements

Audit Report by Office of the Legislative Auditor General

2014 December

https://le.utah.gov/audit/14_13rpt.pdf

Appendix C

An In-Depth Follow-up of The Division of Drinking Water's Minimum Source Sizing Requirements

Follow-up Audit Report by Office of the Legislative Auditor General

2017 December

https://le.utah.gov/audit/17_16rpt.pdf

Appendix D

Metering Equipment Alternatives and Analysis

(Including AMI Technologies and Metering Equipment Technical Specifications)

Technical Report by Bowen Collins & Associates and Hansen Allen & Luce

2017 April

https://documents.deq.utah.gov/drinking-water/engineering/DDW-2017-015441.pdf