



## TCEQ GUIDANCE

Water Supply Division and Office of Compliance and  
Enforcement Regional Areas  
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# Determining Connections and Populations Served for Public Water Systems

This guidance is intended to clarify practical application of “connections” and “population served” (i.e. people served) as they pertain to public water systems (PWSs) to ensure uniform determination. This guidance aggregates rule information regarding connections and populations to provide a single resource for the TCEQ and the regulated public. This guidance also includes a list of relevant resources and describes documentation that will help to ensure consistent data for the accurate application of regulatory requirements.

## Public Water System Fees

The Public Health Service fee – see [Water Supply Division RG-077](#) – is collected by the Texas Commission on Environmental Quality (TCEQ) to fund the services it provides to public water systems. The fees charged to each system are calculated as detailed in 30 Texas Administrative Code (TAC) §290.51(a)(3)-(6). These calculations are dependent on the number of total connections and, in some cases, the population served. This guidance should assist in the uniform determination of number of connections and population served to facilitate fee calculation.

## Other TCEQ Rules Impacted by Connection and Population Served Data

In addition to 30 TAC § 290.51(a)(3)-(6), the drinking water rules which rely on accurate quantification of connection and population served data include, but are not limited to:

- The definition of Public Water System(s) [30 TAC § 290.38(58), (71), (84)];
- The definition of Combined Distribution System [30 TAC § 290.103(2)(B)(i)-(ii)];
- Requirements under General Provisions [30 TAC § 290.39(e)(1)(B), (f)(1), (j)(1)(D)];

- Treatment Design Capacity requirements [30 TAC § 290.42(d)(11)(B)(iv)-(vi)];
- Treatment Analytical requirements [30 TAC § 290.42(d)(15)];
- Water Distribution minimum waterline requirements [30 TAC § 290.44(c), (d)];
- Minimum Water System Capacity requirements [30 TAC § 290.45(b)-(g)];
- Minimum Acceptable Operating Practices - licensed personnel [30 TAC § 290.46(e)], operating records and reports [30 TAC § 290.46(f)], safety standards [30 TAC § 290.46(x)];
- Various Minimum Monitoring requirements - Revised Total Coliform Rule [30 TAC § 290.109(d)(2)(A)(iii)], Disinfectant Residual [30 TAC § 290.110(c)(1)(B)(i), ], Disinfectant By-Products [30 TAC §§ 290.113(a)(2), 290.113(c)(3), 290.115(a)(2), 290.115(c)(1)-(2), 290.115(c)(5)(B)-(C)], Lead and Copper Rule [30 TAC §§ 290.117(c)(1)(A), 290.117(e)(1)], Long-Term 2 Enhanced Surface Water Treatment Rule [30 TAC §§ 290.111(b)(3)(A)(i), 290.111(b)(4)(A), 290.111(c)(3)(A)(iii), 290.111(c)(3)(B)(i)];
- Groundwater Corrective Actions and Treatment Techniques- Microbial inactivation and removal [30 TAC § 290.116(c)(1)(A)];
- Public Education requirements -Lead and Copper Rule [30 TAC § 290.117(k)(4)(A)(ii)];
- Consumer Confidence Report - delivery requirements [30 TAC § 290.274(f), (i)]; and
- Fees for Service to Drinking Water Systems- Public Health Service Fee [30 TAC § 290.51 - see discussion above].

## **Connections and Population Served**

Population served, and number of connections are fundamental characteristics of a PWS. This guidance provides clarification concerning connection terminology as well as resources for population and connection determinations.

The TCEQ obtains current numbers of connections with the potential to be served or being served by PWSs and updated population served numbers through:

- Routine TCEQ regional office comprehensive compliance investigations;
- PWS officials reporting directly to TCEQ's central office Water Supply Division (WSD) staff pursuant to 30 TAC § 290.39(j) regarding changes to existing systems or supplies;
- Regular correspondence with the WSD inventory group; and
- Fee billing process.

The data is recorded in the Safe Drinking Water Information System (a.k.a. “SDWIS”) and is used to determine the regulatory requirements and fees of the system based on the number of connections and population served.

## **Determination of Connections:**

Under 30 TAC § 290.38(16), “connection” means “A single-family residential unit or each commercial or industrial establishment to which drinking water is supplied” from the PWS. The TCEQ interprets an “active connection” as a connection that is completed or existing and able to supply drinking water from the PWS to a single-family residential unit or each commercial or industrial establishment, regardless of whether the single-family residential unit, commercial, or industrial establishment is occupied or unoccupied.

**Active Connections and Total Connections:** The terms “active connections” and “total connections” are synonymous because an active connection includes all connections that have the capacity to receive water from the PWS even if there is no customer receiving the water service at the time of the connection count. The connection is not considered “inactive” unless the ability to provide water is either physically removed or permanently closed. Therefore, the number of active connections is considered equal to the number of total connections, and vice versa.

- Connections that must be counted include those that use the water for potable purposes such as drinking, cooking, brushing teeth, bathing, washing hands, washing dishes, food preparation, and beverage preparation, etc. *See* definition of “drinking water” [30 TAC § 290.38(23)] and “human consumption” [30 TAC § 290.38(36)].
- Connections that should *not* be counted include those that use the water for non-potable purposes *only*, such as irrigation [30 TAC § 290.38(16)(A)]. However, PWSs must comply with 30 TAC § 290.41(b) Water Quantity requirements.
- **Community systems:** Connections are not limited to metered service. All residential, commercial, and industrial service meeting the definition of a connection must be counted, regardless of whether that connection is metered. In community systems, connection counts have a relationship to, but may not be equal to, the number of meters and bill payers. If a meter serves a single family residential unit or commercial or industrial establishment, meter count will equal connection count because community PWSs must provide a meter at each residential, commercial, or industrial service connection under 30 TAC § 290.44(d)(4). However, if a meter serves a residential complex (i.e. apartments, condos, assisted living, etc.) the number of service connections in an apartment complex would be equal to the number of individual living units [30 TAC §290.38(16)].

- **Non-community systems:** In non-community systems the connection count is equal to the number of specific, designated spaces where potable water is available. For example, connections include each hotel room, RV hookup, cabin, or villa, in addition to each kitchen, bathroom, event hall, dining room, etc., which has potable water service from a PWS.

## **Documentation of Connection Count**

The number of connections should include any connection that is being served drinking water by the PWS or has the potential to be served drinking water by the PWS, regardless of whether the connection is a residence that is occupied or unoccupied or if the water service provided by the connection is being paid for or not. As stated above, connection counts have a relationship to, but may not be equal to, the number of meters and bill payers. If a meter serves a residential complex (i.e. apartments, condos, etc.) where multiple single family residential units are present, the total number of individual units is equal to the connection count.

When a PWS contains metered single-family homes and/or industrial or commercial establishments, the connection count *for these homes and establishments* can be documented by meter counts from billing or lot counts from the county appraisal district.

If a PWS contains residential complexes served through a single meter, the residential unit count (i.e. the total number of apartment, condo, etc. units) should be obtained from the complexes, local real estate board, local permitting office, etc. The summation of single-family residential homes, sites providing commercial and industrial services, and complex unit counts should provide the total connection count for a PWS with mixed customer types.

## **Determination of Population served:**

Within the definition of PWS [30 TAC § 290.38(71)] and without excluding other meanings of the terms “individual” or “served,” an individual is deemed to be served by a water system if he consumes water from, lives in, uses as his place of employment, is a customer of, or works in a place to which drinking water is supplied from the system [see 30 TAC § 290.38(23) and (36)]. Available data resources to accurately determine connections and population served are discussed in this guidance.

At the time of each investigation a factual analysis of population served should be completed to obtain the data to support the population served by the system as it pertains to the definition of a public water system, i.e. persons served over a one-year period. This factual analysis should include obtaining sufficient records to document the population served within the past year, *see* Documentation of Population served section below.

In accordance with the definition of “connection” [30 TAC § 290.38(16)], *when enough data is not available* to accurately determine the number of connections to be served or being served, the population served divided by three will be used as the number of connections for calculating system capacity requirements. Conversely, if only the number of connections is known, the connection total multiplied by three will be the number used for population served. *This conversion should only be used when not enough reasonably reliable data is available.*

## **Documentation of Population Served**

The population served for residential areas can be documented by the Census data for the area (i.e. city limits, census block, zip code census, etc.) if the available data can be accurately applied to the PWS service area. Be aware that Census data for a City only accounts for those residing within the City limits and is only performed every ten years. If the PWS service area extends beyond the City limits this may not be an accurate population count. Defer to smaller Census units and approved interim Census estimates, if necessary, to determine an accurate count. Ensure the population counts include special populations, i.e. prisons, retirement facilities, and that such populations are not double counted. For smaller residential communities such as mobile home parks or apartment complexes rental agreements, physical counts of household members, or census estimates of typical household size for the area can be used to support population served.

- **Census data:** Most recent estimates available at the United States Census Bureau’s website or QuickFacts may be used *in absence of more accurate data*. While the Bureau conducts a full population count once every 10 years, these information sources also include population estimates that are within 2 years. The most recent estimates should be used.

For non-transient, non-community populations, such as child care centers, office buildings, industrial areas or similar, the population served could be documented by employment counts of the businesses/industries, counts of vehicles in the parking lot during regular business hours (account for multiple shifts, if needed), enrollment numbers for the services offered, etc. Some facilities are permitted to serve a specific number, i.e. occupancy certificate for an event hall or restaurant, enrollment certification for a childcare or nursing facility. These permits can be used to document population numbers.

For transient populations, such as convenience stores, parks, restaurants, etc. business records can be used to document the population served. Possible records to request or review include sales receipts, guest logs, traffic counters, admission records, etc. Trends identified over a one-year period of time can be used to determine the population served by the PWS.

## **Additional Connection Count and Population Records:**

- **Wholesale agreements:** All wholesale agreements should be provided in both wholesale and purchaser investigations. Water wholesalers must comply with 30 TAC § 290.45(e)(1) and purchasers must comply with 30 TAC § 290.45(f).

**Note:** The number of connections/population served by the contract should be included in the connection count for capacity calculations. Any purchase agreements that agree to a volume that amounts to less than the amount needed to supply the number of connections being served, may result in a capacity violation for the buyer and/or the seller. The records discussed in the sections above may be requested or used to determine accurate connection counts and populations served.

- **Water haulers:** Since Water haulers are their own PWS they should be counted as a wholesale connection.
- **Facility Population Data for Prisons:** The Texas Department of Criminal Justice (TDCJ) maintains detailed population records for each facility. If a TDCJ facility is served by the PWS in question, you may reach out to the facility and request an up to date “count” or call the central office water representative at 936-437-7048 or 936-437-7247 to get facility populations. A complete listing of TDCJ facilities with their statistics and contact information is located on the web at [https://www.tdcj.state.tx.us/unit\\_directory/index.html](https://www.tdcj.state.tx.us/unit_directory/index.html).
- **Housing Authority or Local Real Estate Board:** The local housing authority or real estate board may maintain detailed living unit and unit population data and statistics.

## **Resources**

This guidance is not a substitute for the rules. It is the PWS’s responsibility to ensure that it complies with applicable regulations. Requirements for community and noncommunity PWSs can be located online at:

- The federal Safe Drinking Water Act  
<http://water.epa.gov/lawsregs/rulesregs/sdwa/index.cfm>
- The Texas Health and Safety Code, Chapter 341, Subchapter C  
<http://www.statutes.legis.state.tx.us/Docs/HS/htm/HS.341.htm>
- The Texas Administrative Code (TAC), Title 30, Chapter 290, Subchapters D and F  
[http://texreg.sos.state.tx.us/public/readtac\\$ext.ViewTAC?tac\\_view=4&ti=30&pt=1&ch=290](http://texreg.sos.state.tx.us/public/readtac$ext.ViewTAC?tac_view=4&ti=30&pt=1&ch=290)
- TCEQ Guidance Document for Water Haulers

<https://www.tceq.texas.gov/assets/public/permitting/watersupply/pdw/Water%20Hauler%20Guidance.pdf>

**Examples:**

***Example 1 - Apartment Complex***

A PWS is an apartment complex with its own source which has 100 apartment units and only 75 are occupied with a total of 250 people.

- All 100 units have the potential to be occupied at any time, so the apartment complex has 100 connections. The connection count will remain at 100 until such time additional units are built and connected or existing units are physically removed from the system. If the 75 occupied units have a total of 250 people living in them, the population served is 250. This information can be obtained from lease or rental agreements or census data (for example, the census reported average household size for the area multiplied by the number of occupied units).

**Helpful Hint:** The total/active connections in an apartment complex is equal to the total number of individual apartment units.

***Example 2 - On-going Construction***

A 50-lot subdivision is under construction and all 50 lots have a meter box set (and a meter may even be installed), but the PWS connections have only been completed on eight houses and construction is continuing on the remaining 42 lots.

- Once construction is complete on a house or people are living on the lot, it then becomes a single family residential unit to which drinking water is supplied from the system, i.e. then it becomes a connection.
- Once 15 connections have been completed or the population served is at least 25 individuals, through a lesser number of connections, the subdivision is considered an active PWS.
- To determine population served a direct survey of residents or census data (i.e. average household size for the area multiplied by connections) can be used to determine population.

***Example 3 - Completed Construction***

Connections shall be determined by all completed single-family residential units and/or commercial or industrial establishments once they are connected to a PWS and have the potential to be served drinking water by the PWS.

A 50-lot subdivision has been completed and 50 houses exist, but only 8 houses are occupied.

- 50 houses exist; therefore the system has 50 connections.
- Once construction is complete on a house and it becomes a single family residential unit to which drinking water is or could be supplied from the system, even if the single-family residence unit is unoccupied, all 50 houses have the potential to be served drinking water by the PWS.
- The connection count will remain at 50 until such time additional units are built and connected or existing units are physically removed from the system.
- The population served by the system are those living in the eight occupied houses. To determine population served a direct survey of residents or census data (i.e. average household size for the area multiplied by connections) can be used to determine population.

***Example 4 - Mobile Home Parks (MHPs)***

A MHP has 30 lots available for rent or purchase and water service is provided to all 30 lots and a laundry facility. Only 8 lots have mobile homes located on them and the other 22 lots are vacant.

- A total of 31 service connections, 30 lots and laundry facility, have the potential to be served water by the PWS since, unlike a house, a mobile home can be located on any of the 30 lots at any time. MHPs typically fit the community water system definition based on the limited mobility and residential nature of the living units.
- The population served of the MHP can be determined from a direct survey of residents, lease or rental agreements and occupancy record review over the previous year. If specific numbers of people served cannot be determined, census data (i.e. average household size for the area multiplied by occupied connections) can be used to determine population.

***Example 5 - Campground***

A campground has 45 lots - 20 recreational vehicle spots and 25 campsites - available for rent, men's and women's restrooms. Water service is provided to all 45 locations and restrooms. During an investigation only 13 lots -11 recreational vehicle and 2 campsites - are currently occupied and the other 32 lots are vacant.

- A total of 45 connections have the potential to be served drinking water by the PWS since, unlike a house, a recreational vehicle or tent campsite can be located on any of the 45 lots at any time. Additionally, the two restrooms serve the public. Therefore, the campground has a total of 47 connections.
- The population served by the campground can be determined from RV rental agreements and site occupancy record reviews over the previous year. The campground may also have traffic counter records or other data to assist in this determination.



**Helpful Hint:** Separate men's and women's restrooms count as two specific, designated spaces with connections.

***Example 6- Recreational Vehicle Parks (RVPs)***

A RVP has 30 lots available for rent and water service is provided to all 30 lots. Only 8 lots have RVs located on them and the other 22 lots are vacant.

- A total of 30 connections have the potential to be served drinking water by the PWS since an RV, unlike a house, can be located on any of the 30 lots at any time.
- The population served by the RVP can be determined from RV rental agreements and occupancy record review over the previous year. The RVP may also have traffic counter records or other data to assist in this determination.

***Example 7 - A Multi-Purpose Resort and Events Hall***

A multi-purpose resort and events hall has two kitchens with a sink each, three bathrooms with a sink each, three hotel rooms with sinks and bathrooms, ten villas/cabins with sinks and bathrooms, a theater with a drinking fountain, a museum with drinking a fountain, and a bar with an ice machine. During an investigation each of these connections is identified and counted.

- A total of 21 service connections exist that have the potential to serve water in specific, designated spaces where drinking water has the potential to be served.
- Duration of habitation is not a factor in connection counting because the TCEQ does not make a distinction between total connections and active connections.
- Population served by this system can be determined by review of operational records for the year. This can include hotel/cabin/villa rental records, event hall rental records, theater, museum, and bar usage records. The occupancy allowances of the rooms for rent, rental hall, and theater, museum, and bar can also be used to support probable population numbers.

***Example 8- Mixed Development Types***

A community PWS serves a mid-sized suburb with 17 subdivisions with a total of 4,250 single family homes, they also serve two industrial parks with 25 industrial connections, four strip centers with 27 commercial connections, and 3 apartment complexes with a total of 350 apartment units. The service area of the PWS is contained within two zip codes and no other drinking water provider serves the area. The census data for those zip codes indicates a population of 12,652 people.

- The PWS serves a total of 4,652 connections. In addition to available meter data for metered connections other records to consider include: property records to assist in determining the single-family home connections, service agreements to

determine the industrial and commercial connections, and local housing authority or real estate board information to determine the apartment units.

- The population served is 12,652 people.

### ***Example 9- Industrial Complex***

A chemical plant has 4 buildings where approximately 75 persons work every day. The main building includes a breakroom and each building has a community restroom. There are 25 employee truck drivers that come and go and stop for coffee and restrooms and to take breaks between deliveries.

There are 3 eye wash stations located throughout the complex and 4 rooms located in Building 2 for temporary overnight stays. These rooms share one additional restroom.

- A total of 9 connections have the potential to serve water (3 eyewashes, 4 community bathrooms, the breakroom, and the overnight bathroom). The four overnight rooms would not be separate connections because they share a common restroom.
- Total population served for this site would be 100; this is the sum of the 75 plant personnel and 25 truck drivers.

### ***Example 10- Strip Center***

A strip center containing 8 businesses is served water from one well. Each business has a meter in order to calculate the amount of water consumed by each.

Two of those businesses house offices and have a total of 8 of the same people that come in every day and a bathroom and breakroom in each unit. The other 6 businesses are small fast food establishments that serve a total population of 100 persons a day with approximately 2 employees for each of the 6 businesses. Each restaurant unit has a restroom and a kitchen.

- The PWS has a total of 16 connections. Each of the eight units contains a restroom and either a kitchen or breakroom.
- Total population served would be 120 people. (Office employees = 8, Restaurant employees = 12, and Restaurant Customers= 100).

### ***Example 11- PWSs serving Marinas***

A PWS serves a marina with 25 boat slips without hose bibs at each slip, a bait shop with a restroom, and a small café with a kitchen and restroom all being served by one well. The marina has 6 employees and approximately 25 people per day come to the marina to fish, eat or take their boats out.

- A total of 3 connections (bait shop restroom, café kitchen, café restroom) because the boat slips do not have the potential to provide water.

- Total population served would be 31. (Employees= 6, customers=25).

A PWS serves a marina with 25 boat slips with hose bibs at each slip, a bait shop with restroom, a small café (kitchen and restroom), and a shower facility. All facilities are served by one well. The marina has 6 employees and approximately 25 people per day come to the marina to fish, eat or take their boats out. Only 20 boat slips are being used at the time of investigation. All boat slips have a potable water hose bib.

- A total of 29 connections. Count all 25 boat slips because they have the potential to serve drinking water at any time.
- Total population served would be 31. (Employees= 6, customers=25).

**Helpful hint:** Connection counts in non-community systems include hose bibs since these can provide water for human consumption.

***Example 12- Oil Field Housing (a.k.a. “Man camps”)***

A PWS serves a housing facility for oil field workers where each of 12 modular mobile units are occupied by 8 workers, with a bathroom in each unit, for a total of 96 workers. One additional unit is set up for cooking and a place for the employees to eat. The workers work in 2-week rotations for as long as they are needed, then a new set of 96 men come on board.

- This PWS has a total of 13 connections. 12 for each modular unit’s bathroom and 1 for the modular kitchen/dining hall.
- A total population of 96 served.