

# APPENDIX 7

## FLOW RATES FOR SUBSURFACE SEWAGE DISPOSAL SYSTEM DESIGN

### A. Residential Structures

~~Projected wastewater flow rates from single family dwellings are divided into two (2) categories. The first category (Category One) outlines the projected wastewater flow rates for those single-family dwellings utilizing only standardized plumbing fixtures and containing no oversized bathing fixtures. The second category (Category Two) outlines the projected wastewater flow rates for those single family dwellings utilizing or containing one or more of any type of oversized bathing fixtures (i.e. any type of bathing fixture, regardless of its moniker, that will physically hold an amount of water exceeding 30 US gallons, either to the level of the fixture's overflow drain or as its maximum capacity).~~

#### ~~1. Residential Waste Flow - Category One~~

~~For subsurface sewage disposal systems serving residential single-family dwellings, containing no oversized bathing fixtures, the projected daily wastewater flow rate shall be based solely on the number of bedrooms proposed or that can be anticipated for said dwelling. For design purposes, the estimated daily wastewater flow shall be 150 gallons per day (gpd) for each bedroom (BDR) contained within said dwelling.~~

#### Example:

~~The projected daily wastewater flow calculation for a four (4) bedroom single-family dwelling containing no oversized bathing fixture(s) is as follows:~~

$$\begin{aligned} Q &= \text{BDR} \times \text{EDWF} \\ Q &= (4 \text{ bdr}) \times (150 \text{ gpd/bdr}) \\ Q &= 600 \text{ gpd} \end{aligned}$$

~~Where:~~

$$\begin{aligned} Q &= \text{Projected Daily Wastewater Flow (gpd)} \\ \text{BDR} &= \text{Number of Bedrooms in dwelling (bdr)} \\ \text{EDWF} &= \text{Estimated Daily Wastewater Flow (i.e. 150 gpd/bdr)} \end{aligned}$$

~~Therefore, the projected daily wastewater flow from this dwelling would be 600 gallons per day.~~

#### ~~2. Residential Waste Flow - Category Two~~

~~For subsurface sewage disposal systems serving residential single-family dwellings utilizing oversized bathing fixtures, the projected daily wastewater flow shall be calculated so as to account for the additional projected wastewater discharge they produce. For design purposes, the projected daily wastewater flow from such dwellings shall be based, not only on the number of proposed (or anticipated) bedrooms at 150 gallons per day per bedroom (gpd/bdr), but also on the additional estimated daily wastewater flow produced by said fixtures. The following formula shall be used to calculate the projected daily wastewater flow from such structures:~~

$$Q = [(\text{OSBFC} - 30) \times (\text{BDR})] + (\text{EDWF} \times \text{BDR})$$

~~Where:~~

$$\begin{aligned} Q &= \text{Projected Daily Wastewater Flow (gpd)} \\ \text{OSBFC} &= \text{Oversized Bathing Fixture Capacity (gpd/bdr)} \\ 30 &= \text{Standard Bathing Fixture Capacity (gpd/bdr)} \\ \text{BDR} &= \text{Number of Bedrooms in dwelling (gpd)} \\ \text{EDWF} &= \text{Estimated Daily Wastewater Flow (i.e. 150 gpd/bdr)} \end{aligned}$$

#### Example 1:

~~The projected daily wastewater flow calculation for a subsurface sewage disposal system serving a four (4) bedroom single-family dwelling containing one 80-US gal. oversized bathing fixture is as follows:~~

$$\begin{aligned} Q &= [(\text{OSBFC} - 30) \times (\text{BDR})] + (\text{EDWF} \times \text{BDR}) \\ Q &= [(80 \text{ gpd/bdr} - 30 \text{ gpd/bdr}) \times 4 \text{ bdr}] + (4 \text{ bdr} \times 150 \text{ gpd/bdr}) \\ Q &= [(50 \text{ gpd/bdr}) \times (4 \text{ bdr})] + (600 \text{ gpd}) \\ Q &= 200 \text{ gpd} + 600 \text{ gpd} \\ Q &= 800 \text{ gpd} \end{aligned}$$

~~Therefore, the projected daily wastewater flow from this dwelling would be 800 gallons per day.~~

~~Note: Where a single family dwelling contains more than one (1) oversized bathing fixture, the projected daily wastewater discharge produced from each such fixture shall be accounted for.~~

~~Example 2:~~

~~The projected daily wastewater flow calculation for a subsurface sewage disposal system serving a four (4) bedroom single family dwelling containing one 80 US gal. oversized bathing fixture and one 75 US gal. oversized bathing fixture is as follows:~~

~~$Q = \{[(OSBFC - 30) + (OSBFC - 30)] \times (BDR)\} + (EDWF \times BDR)$~~

~~$Q = \{[(80 - 30) + (75 - 30)] \times (4)\} + (150 \times 4)$~~

~~$Q = \{[(50) + (45)] \times (4)\} + (600)$~~

~~$Q = \{[(95) \times (4)]\} + (600)$~~

~~$Q = 380 + 600$~~

~~$Q = 980 \text{ gpd}$~~

~~Therefore, the projected daily wastewater flow from this dwelling would be 980 gallons per day.~~

**B. Structures Other Than Residential**

The flow rates set forth in Table A7-1 will be utilized for establishing a *design flow rate* (DFR) for various types of facilities or establishments (i.e. structures or buildings erected to serve a particular purpose), other than residential single-family dwellings, based upon their use.

Table A7-1

Type of Establishment	Design Unit (DUN)	Design Flow Rate (DFR) (US gallons/design unit/day)
<b>Churches</b>	-----	-----
Church	Per Seat	5
Church with Kitchen Facility	Per Seat	8
Church with Child Daycare Facilities	See Note 1	-----
Church Facility with Multiple Buildings	See Note 1	-----
<b>Commercial/Industrial Facilities</b>	-----	-----
Airports, Bus or Rail Depots (without food service facilities)	Per Passenger	5
Barber Shop	Per Chair	100
Beauty Salon	Per Chair	125
Bowling Alley	Per Lane	75
Child Day-care Facility (operated within a dedicated building)	Per Person (children and adults)	20
Child Day-care Facility (operated within an existing dwelling)	Per Bedroom	170
Temporary Construction Offices/Work Camp (without shower facilities)	Per Person	40

Table A7-1, continued

Type of Establishment	Design Unit (DUN)	Design Flow Rate (DFR) (US gallons/design unit/day)
Factory or Plant (without shower facilities)	Per Employee	20
Temporary Construction Offices/Work Camp (with shower facilities)	Per Person	80
Convenience Store or Market	See Note 2	-----
Equestrian Related Business (i.e. horse barn, stables, etc.)	See Note 3	-----
Factory or Plant (with shower facilities)	Per Employee	40
Grocery Store (without any food service facilities)	Per Toilet Room (i.e. male and female)	200
Interstate or Highway Rest Areas or Visitor Centers	See Note 2	-----
Laundry, Self Service	Per Machine	500
Marina (without bathing facilities)	Per Boat Slip	25
Marina (with bathing facilities)	Per Boat Slip	50
Office Buildings (having either single or multiple offices)	Per Total Number of Employees	20
Individual Retail Store (i.e. other than Shopping Center or Mall)	Per Toilet Room (i.e. male and female)	400
Vehicle Service Station (without any food service or public toilet facilities)	Per Employee	20
Shopping Center or Mall	Per 1000 Sq. Ft. of Building Space	150
Stadium, Auditorium, Theater (any type)	Per Seat	5
<b><i>Dwelling Units</i></b>	-----	-----
Apartment (Apt.) Buildings	-----	-----
For Each – One Bedroom Apt.	Per Apt. Unit	250
For Each – Two Bedroom Apt.	Per Apt. Unit	300
For Each – Three Bedroom Apt.	Per Apt. Unit	350
Bed & Breakfast Establishment	Per Bedroom in Dwelling Rented	175
Boarding or Rooming House (no meals served)	Per Bedroom in Dwelling Rented	175
Boarding or Rooming House (meals served)	Per Bedroom in Dwelling Rented	200
Hotels or Motels (with private bathrooms; no over sized bathing fixtures)	Per Room	150

Table A7-1, continued

Type of Establishment	Design Unit (DUN)	Design Flow Rate (DFR) (US gallons/design unit/day)
<b><i>Food Service and/or Drinking Establishments</i></b>	-----	-----
Ordinary Restaurant (not subject to 24 hr. operations)	Per Seat	40
Restaurant Operating 24 Hrs./Day (not subject to US Hwy. or Interstate access)	Per Seat	80
Restaurant Operating 24 Hrs./Day (subject to US Hwy. or Interstate access)	Per Seat	150
Drive-in or Take-out Restaurant	Per Hour Open for Business	70
Tavern, Bar, Lounge, Etc. (having no food service)	Per Seat	40
Tavern, Bar, Lounge, Etc. (having restricted food service)	Per Seat	60
Catering Business – Banquet Facilities	Per Person	30
<b><i>Institutions</i></b>	-----	-----
Assembly Halls, Public Buildings	Per Seat	5
Home for the Aged	Per Bed	125
Medical Hospital	Per Bed	300
Mental Hospital	Per Bed	180
Nursing Home	Per Bed	180
Prison or Jail	Per Bed	125
Schools – Any Type	See Note 4	-----
<b><i>Recreational Establishments</i></b>	-----	-----
Camps – Daytime Use Only (having permanent toilet facilities – serving no meals)	Per Person	15
Camps – Daytime Use Only (having permanent toilet facilities and serving meals)	Per Person	25
Fairgrounds or Mass Gathering Facility (based upon peak daily attendance figure)	Per Person	3
Golf Course Clubhouse (based upon peak daily attendance figure)	Per Person	10
Park – Public Restroom Facility	Per Parking Space	5
Swimming Pool with Bathhouse (based upon peak seasonal attendance figure)	Per Person	10
Travel Trailer Park (i.e. having water, and sewer hook-ups or disposal site)	Per Trailer Space	100
Travel Trailer Park (i.e. with no water, and sewer hook-ups or disposal site)	Per Trailer Space	75
<b><i>Miscellaneous</i></b>	-----	-----
Veterinary Hospital (any type)	See Note 2	-----

As discussed in *Section 4*, the Department cannot possibly address or define each and every possible scenario where the use of a subsurface sewage disposal system may be required. Thus, Table A7-1 cannot list each and every type of structure, and its associated use, so as to establish a design flow rate for such. Therefore, the Department reserves the right to amend, adjust, modify or alter the design flow rates presented in this Appendix so as to establish an appropriate, case/site specific, design flow rate where deemed necessary.

Where a type of establishment is proposed to be constructed, that is not listed in Table A7-1 of this Appendix, the Department shall have the authority to require the submittal of any additional or supplementary information or documentation (i.e. this information is in addition to what would already be required, as shown in Table A7-1, such as seating capacities, patron capacities, etc.) from the developer (i.e. person, persons, companies, consultants representing the developer, etc.) proposing to use a parcel of land for any of the aforementioned classifications (i.e. commercial, industrial, etc.) of establishments. Such information or documentation shall be utilized by the Department to establish a design flow rate for a proposed structure. The types of information or documentation that the Department shall require includes, but is not limited to:

- ◆ Water use documentation from existing, similar types of establishments from other locations.
- ◆ Any documented subsurface sewage disposal system information from existing, similar types of establishments from other locations.
- ◆ The hours of business operations.
- ◆ The number of employees that will occupy the proposed establishment.

Where the Department utilizes documented water use records in establishing an appropriate design flow rate for any facility, the Department will assess the records for the peak water use/output and establish an appropriate design flow rate.

***IMPORTANT NOTE:** Under no circumstances shall the mean or average of such water use data be utilized as the design flow rate or in the calculation of a projected daily wastewater flow (Q) for any proposed structure.*

Additionally, an established design flow rate shall never be less than seventy-five (75) percent of a documented (i.e. shown in the submitted water use data) peak flow rate or water use unit.

#### **NOTE 1**

Church facilities containing multiple buildings and/or providing child day-care services require detailed and thorough planning by the Department when establishing the subsurface sewage disposal system requirements for such facilities. Additional information regarding the nature of operation of a child day-care (i.e. number of children, days of operation, hours of operation, preparation and serving of meals, etc.) is necessary for the Department to determine the appropriate design flow rate for the proposed church facility. The day-care information is assessed and subsequently combined with the design flow rating for the church so as to provide an accurate total design flow rate for the facility.

Multiple buildings planned for church facilities shall have individual subsurface sewage disposal systems serving each building in accordance with the provisions outlined in *Section 4*. Said subsurface sewage disposal systems shall be planned and specified in accordance with the provisions of these regulations.

#### **NOTE 2**

Establishing design flow rates for these facilities (or other like establishments) shall require the submittal to and the review of water use records from like establishments by the Department. The Department shall require that the water use records, from said like establishment, covering an eighteen (18) month period be submitted for review.

#### **NOTE 3**

Equestrian related business facilities containing either single or multiple buildings require detailed and thorough planning by the Department when establishing the subsurface sewage disposal system requirements for such facilities. Additional information regarding the nature of operation of these types of businesses (i.e. number of employees, number of horse stables, days of operation, hours of operation, presence of public restroom facilities, presence of interior horse washing facilities, etc.) is necessary for the Department to determine the appropriate design flow rate for such establishments. Subsequent subsurface sewage disposal system requirements shall be set forth in accordance with the provisions of *Section 4*.

#### **NOTE 4**

The use of subsurface sewage disposal systems as the primary means of sewage disposal for either private or public school facilities (i.e. boarding schools, church schools, elementary schools, middle schools, high schools, colleges, universities, etc.) shall not be approved by the Department.