



## CITY OF POQUOSON

ENGINEERING DEPARTMENT

500 CITY HALL AVENUE, POQUOSON, VIRGINIA 23662-1996  
(757) 868-3590 TELEPHONE (757) 868-3515 FAX

June 2, 2008

To: All Engineers/Developers

Re: Proposed Sewage Flows

From: City Engineer

The City of Poquoson is one of 13 municipalities in the Hampton Roads area that has their sewage treated by Hampton Roads Sanitation District. HRSD and these 13 municipalities are under a DEQ Consent Order to reduce Sanitary Sewer Overflows. A portion of our commitment to the DEQ under this Consent Order is to model our sewer systems to determine capacities required for pipes, pump stations and treatment plants. The attached data provides the flow quantities to be used to calculate all new sewage flow for any development in Poquoson and throughout the local region.

Should you have any questions in determining how the calculations should be made, please refer to HRSD and DEQ for guidance.

Thank you for your support, and please do not hesitate to contact me if you have any questions or need additional information.

Sincerely,

Jeffrey J. Bliemel, P.E.  
City Engineer & Project Infrastructure Coordinator

JJB/jb

CC: City Manager  
Community Development Coordinator  
Utility Superintendent

# Hampton Roads Regional Sewage Flow Projection Data

V 2.0 April 21, 2008

Discharge Facility	Contributing Design Units	Flow gpd/Unit	Flow Duration hours	Peak Factor
Dwellings	Per Residential Unit	310	24	2.5
Schools	Per Person	10	8	3
Boarding Schools	Per Person	75	16	3
Motels & Hotels	Per Room	130	24	3
Trailer courts, Apartments, Condos, Townhomes, & Time Shares	Per Unit	310	24	2.5
Restaurants (including fast food)	Per Seat	30	16	3
Service Stations	Per Gross SF	0.4	16	3
Shopping Centers	Per Gross SF	0.2	12	3
Hospitals	Per Bed	300	24	3
Nursing Homes/Assisted Living	Per Bed	160	24	3
Doctor's offices in medical centers	Per Gross SF	0.25	12	3
Laundromats	Per Machine	500	16	3
Community colleges	Per Student & Faculty	10	12	3
Theaters (auditorium type)	Per Seat	2.5	12	3
Picnic areas	Per Person	5	12	3
Camps, resort day & night w/limited plumbing	Per Site	50	24	3
Luxury camps w/flush toilets	Per Site	100	24	3
Warehouse	Per Gross SF	0.05	24	3
Convenient Store	Per Gross SF	0.3	24	3
Office Building	Per Gross SF	0.1	12	3
Fitness Center	Per Gross SF	0.1	16	3

Religious Assembly	Per Seat in Main Assembly Room	2.5	6	3
Heavy Industrial	Per Gross SF	0.35 <sup>(1)</sup>	16	3
Light Industrial	Per Gross SF	0.1 <sup>(1)</sup>	16	3

(1) The stated flow per day per unit is provided as a guide and should only be used if known data for similar heavy or light industrial facilities is not available.

For undeveloped property zoned **other than residential**, average daily flows may be projected at a rate of 1,000 gpd per acre. Consideration should be given to designated wetlands and Chesapeake Bay Preservation Act Resource Protection Areas which should be excluded from the gross acreage. A peaking factor of 3 shall be used.

For undeveloped property zoned **residential**, average daily flows may be projected at a rate of 310 gpd per unit based on the zoning density. A peaking factor of 2.5 shall be used.

Flow duration should be taken into account for the design of on-site infrastructure and when discharging into Publicly owned force mains, but need not be considered for downstream publically owned gravity collections systems. Additionally, the SCAT Regulations require a peaking factor of 4 be applied to the average daily flow when designing laterals and submains. For example in designing an **on-site sewer lateral** or an **on-site/private pump station** for a shopping center that has a gross square footage of 7,500 SF the flow duration should be applied as follows:

$$7,500 \text{ SF} \times 0.20 \text{ gpd/SF} = 1,500 \text{ gpd}$$

$$1,500 \text{ gpd} / (12 \text{ hr duration day} \times 60 \text{ min/hr}) = 2.08 \text{ gpm}$$

$$2.08 \text{ gpm} \times 4 \text{ (peak factor per SCAT Regulations)} = 8.32 \text{ gpm}$$

**Sound engineering judgment must be used in all applications of these flow projection guidelines.**