

# SANITARY FLOW OFFSET MITIGATION FOR DEVELOPMENT

February 12, 2019

The Developer Offset-Mitigation Program was established to aid in protecting the health and safety of our community and the environment by not allowing new development to exacerbate sewage collection system capacity issues or “MDEQ permitted” overflows of partially treated sewage by our treatment plant to the Huron River. The goal of the program is to offset *new* sewage flow added to the sanitary sewer system by new development and to regain lost system capacity through applying a 10% System Recovery Factor as part of the requirement. Existing sewage flows can offset proposed flows for determining required mitigation. Acceptable flow removal/mitigation alternatives can be found in the Developer Offset-Mitigation Program Guidelines.

## **Site 1: 48 Apartment Units (each apartment is 900 sf)**

Design Flow = 250 GPD/unit (from Table A)

48 units x 250 GPD/unit = 12000 GPD

Peak Flow = 12,000 GPD x 4 (peaking factor) x 1.1 (System Recovery Factor) =

52,800 GPD (52,800 GPD x 1 day/24 hrs x 1 hour/60 mins) =

37 GPM Peak Flow to be mitigated

## **Site 2: Office Building (non-medical) 60,000 sf gross area**

Design Flow = 0.06 GPD/sf gr floor area (from Table A)

Proposed Development has 60,000 sf x .06 GPD/sf = 3,600 GPD

Peak Flow = 3,600 GPD x 4 (peaking factor) x 1.1 (System Recovery Factor) =

15,840 GPD (15840 GPD x 1 day/24 hrs x 1 hour/60 mins) =

11 GPM Peak Flow to be mitigated

## **Site 3: Demolish Existing Office Building (non-medical) 60,000 sf gross area and Replace with 200 Apartment Units (each apartment is 1250 sf)**

Design Flow of Office is 0.06 GPD/sf; Design Flow of Apartment is 300 GPD/unit (from Table A)

### **Proposed – Existing Flows**

(200 apartments x 300 GPD/unit) – (60,000 sf x 0.06 GPD/sf of floor area) =

56,400 GPD x 4 (Peaking factor) x 1.1 (System Recovery Factor) =

248,160 GPD (248,160 GPD x 1 day/24 hrs x 1 hr/60 min) =

172 GPM Peak Flow to be to be mitigated

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**Site 4: Repurpose Office Building (non-medical), 36,000 sf gross area, and Large Research Facility, 32,000 sf gross area, and replace with Non-Medical Office Space, 68,000 sf gross area**

Design Flow of Non-Medical Office is 0.06 gpd/sf; Design Flow of Large Research Facility as determined by Public Services Area Administrator is 0.35 gpd/sf (from Table A)

Proposed – Existing Flows

$(68,000 \text{ sf} \times 0.06 \text{ GPD/sf}) - (36,000 \text{ sf} \times 0.06 \text{ GPD/sf} + 32,000 \text{ sf} \times 0.35 \text{ GPD/sf}) = -9,280 \text{ GPD}$

$-9,280 \text{ GPD} (-9,280 \text{ GPD} \times 1 \text{ day}/24 \text{ hrs} \times 1 \text{ hour}/60 \text{ mins}) = -6 \text{ GPM}$

Credit of 6 GPM

TABLE A

TYPE OF FACILITY OR USE	DESIGN DRY WEATHER FLOW RATE
Single Family Residence	300 gpd
Two Family Residence (Duplex)	600 gpd
Apartments, condos, mobile homes, trailers, coops, etc. up to 600 sq. ft. of gross floor area	175 gpd/unit
Apartments, condos, mobile homes, trailers, co-ops., etc. between 601-1200 sq. ft. of gross floor area	250 gpd/unit
Apartments, condos, mobile homes, trailers, co-ops., etc. greater than 1200 sq. ft. of gross floor area.	300 gpd/unit
Motel or hotel unit less than 400 sq. ft	75 gpd/unit
Motel or hotel unit greater than 400 sq. ft.	150 gpd/unit
Hospital and Nursing Homes (without laundry)	150 gpd/bed
Hospital and Nursing Homes (with laundry)	300 gpd/bed
University housing, rooming house, or apartment unit housing more than 4 people	75 gpd/capita
Cafeteria (integral to an office, industrial building, or school)	2.50 gpd/capita
Non-Medical Office space	0.06 gpd/sq.ft. of gross floor area
Medical Office Space (doctor, dentist, urgent care, etc.)	0.10 gpd/sq.ft. of gross floor area
General Industrial Space	0.04 gpd/sq.ft. of gross floor area
Auditorium/Theater	5 gpd/seat
Bowling alley (plus food service areas per Restaurant standard)	100 gpd/alley
Parking Structure (exc. spaces on uncovered top decks)	27 gpd/parking space to maximum of 3,375 gpd
Church	1.50 gpd/seat
Fast Food Restaurants and Coffee Shops	20 gpd/seat
Restaurant (Other Than Fast Food)	30 gpd/seat
Stores with Food Processing but no seating (delis, butcher shop areas, etc.)	0.15 gpd/sq.ft. of gross floor area
Stores with Non-Food Process Water (barbershop, beauty salon, etc.)	0.10 gpd/sq.ft. of gross floor area
Retail Store (no process water discharge)	0.03 gpd/sq.ft. of gross floor area
Catering Hall	7.50 gpd/capita based on maximum occupancy
Grocery Store (Note: Deli and butcher shop areas to be calculated using Stores with Food Processing design rate)	0.05 gpd /sq.ft. of gross floor area
Bar, Tavern, Nightclub with no food preparation	15 gpd/capita based on maximum occupancy
Bar, Tavern, Nightclub with food preparation	30 gpd/seat
Swimming Pool (Note: Filter Backwash to be calculated using Swimming Pool Filter Backwash design rate)	20 gpd/capita based on maximum occupancy
Swimming Pool Filter Backwash based on manufacturer's spec.	To Be Determined by Public Services Area Admin.
Gas Stations	300 gpd/double hose pump
Warehouse and Storage Facilities: Manned Areas	0.06 gpd/sq.ft. of gross floor area
Laundry	425 gpd/laundry machine
Nursery and elementary schools	10 gpd/student
Middle and high schools	20 gpd/student
Spa, Country Club	0.30 gpd/sq.ft. of gross floor area
Industrial or Manufacturing Facility, Large Research Facility, or other uses not specified	To Be Determined by Public Services Area Admin.
Others (car wash, etc)	To Be Determined by Public Services Area Admin.