# APPENDIX D
# Infrastructure

# COMPARISON OF EXISTING AND PLAN VOLUME

**CSO SUBCATCHMENT AREA:**

## EXISTING

| | | Area = 79,000 SF (1.81 ACRES) | | |
|---|---|---|---|---|
| | | **15 PENN PLAZA** | | |
| **RAINFALL VOLUME (in)** | **RAINFALL DURATION (hr)*** ** | **RUNOFF VOLUME TO CSS (MG)** | **SANITARY VOLUME TO CSS (MG)[3]** | **TOTAL VOLUME TO CSS (MG)** |
| 0.00 | 3.80 | 0.000 | 0.062 | 0.062 |
| 0.40 | 3.80 | 0.020 | 0.062 | 0.082 |
| 1.20 | 11.30 | 0.059 | 0.184 | 0.243 |
| 2.50 | 19.50 | 0.123 | 0.317 | 0.440 |

## PLAN

| | | Area = 79,000 SF (1.81 ACRES) | | |
|---|---|---|---|---|
| | | **15 PENN PLAZA (NO BUILD SCENARIO)** | | |
| **RAINFALL VOLUME (in)** | **RAINFALL DURATION (hr)*** ** | **RUNOFF VOLUME TO CSS (MG)** | **SANITARY VOLUME TO CSS (MG)[3]** | **TOTAL VOLUME TO CSS (MG)** |
| 0.00 | 3.80 | 0.000 | 0.022 | 0.022 |
| 0.40 | 3.80 | 0.020 | 0.022 | 0.042 |
| 1.20 | 11.30 | 0.059 | 0.065 | 0.124 |
| 2.50 | 19.50 | 0.123 | 0.113 | 0.236 |

| | | Area = 79,000 SF (1.81 ACRES) | | |
|---|---|---|---|---|
| | | **15 PENN PLAZA (SINGLE TENANT SCENARIO)** | | |
| **(in)** | **DURATION (hr)*** ** | **CSS (MG)** | **CSS (MG)[3]** | **TOTAL VOLUME TO CSS (MG)** |
| 0.00 | 3.80 | 0.000 | 0.040 | 0.040 |
| 0.40 | 3.80 | 0.020 | 0.040 | 0.059 |
| 1.20 | 11.30 | 0.059 | 0.118 | 0.177 |
| 2.50 | 19.50 | 0.123 | 0.203 | 0.326 |

| | | Area = 79,000 SF (1.81 ACRES) | | |
|---|---|---|---|---|
| | | **15 PENN PLAZA (MULTI TENANT SCENARIO)** | | |
| **(in)** | **DURATION (hr)*** ** | **CSS (MG)** | **CSS (MG)[3]** | **TOTAL VOLUME TO CSS (MG)** |
| 0.00 | 3.80 | 0.000 | 0.040 | 0.040 |
| 0.40 | 3.80 | 0.020 | 0.040 | 0.059 |
| 1.20 | 11.30 | 0.059 | 0.118 | 0.177 |
| 2.50 | 19.50 | 0.123 | 0.204 | 0.327 |

If the proposed action/rezoning area crosses over several different CSO sub-catchment areas, the above analysis should be copied for each dependent on the size and type of development projected for each of the sub-catchment areas. Consult with DEP regarding projected development information and
* specific analysis areas.

** If existing and/or planned site is comprised of two discrete or phased sites, combine using additional cells above.

*** Based on ***Intensity/duration/Frequency Rainfall Analysis, New York City and the Catskill Mountain Water Supply Reservoirs,*** Vieux & Associates, Inc., April 4, 2006. The 24-hour rainfall volume is based on average rainfall intensity over 24-hours (inch/per) times 24 hrs. (Duration information provided by T. Newman & P. Jadhav, HydroQual).

**NOTES:**

1 RUNOFF VOLUMES for EXISTING and PLAN condition have been calculated as follows:

$$Q_{VOL} = [R_{VOL} \times A \times RC \times 7.48GAL/1{,}000{,}000\ MGD\ per\ GAL] - S_{VOL}\ ;\ where$$

$Q_{VOL}$ = Total Volume of Rainfall for 24-hour storm event discharged offsite (either to River or into CSS), in MG

$R_{VOL}$ = RAINFALL VOLUME, in Inches, for the corresponding RAINFALL RETURN PERIOD listed in the EXISTING and PLAN Tables.

A = SITE AREA, in SQ. FT., as indicated in the EXISTING and PLAN Tables for the various site areas.

RC = RAINFALL RUNOFF COEFFICIENT for each of the applicable Site Areas as per Table 3A for EXISTING and Table 3C for PLAN (for Tables 3A and 3C, refer to EXISTING AND PLAN FLOWS Worksheet).

2 RAINFALL RUNOFF COEFFICIENTS used are composite rates as shown in TABLE 3A for EXISTING and TABLE 3C for PLAN (Refer to RUNOFF COEFFICIENTS WORKSHEET for TABLES 3A and 3C).

3 Sanitary 24-hr demand volume as per DEIS Chapter dated April 7, 2009.

**CALCULATIONS FOR EXISTING (TABLE 3A) AND PLAN (TABLE 3B) FLOW CONDITIONS**

| TABLE 3A | EXISTING* | | | | | |
|---|---|---|---|---|---|---|
| | WEIGHTED RUNOFF COEFFICIENT, C | | | | | |
| | SURFACE TYPE[1] | ROOF[2] | PAVT & WALKS | OTHER[3] | GRASS & SOFT SCAPE | TOTAL |
| 15 PENN PLAZA | AREA, % | 100.0% | 0.0% | 0.0% | 0.0% | 100.0% |
| | SURFACE AREA, SF | 79,000 | 0 | 0 | 0 | 79,000 |
| | RUNOFF COEFFICIENT | 1.00 | 0.85 | 0.75 | 0.20 | **1.00** |

**NOTES:**

| | |
|---|---|
| * | **Please complete separate tables for surface areas that discharge to combined sewer system or separate storm sewer/direct discharge to waterbody.** |
| 1 | Runoff coefficients for each surface type are as per NYCDEP. |
| 2 | Total roof areas onsite. |
| 3 | Identify any other surfaces onsite and obtain runoff coefficients from NYCDEP. |

| TABLE 3B | PLAN* | | | | | |
|---|---|---|---|---|---|---|
| | WEIGHTED RUNOFF COEFFICIENT, C | | | | | |
| | SURFACE TYPE[1] | ROOF[2] | PAVT & WALKS | OTHER[3] | GRASS & SOFT SCAPE | TOTAL |
| NO BUILD SCENARIO | AREA, % | 100.0% | 0.0% | 0.0% | 0.0% | 100.0% |
| | SURFACE AREA, SF | 79,000 | 0 | 0 | 0 | 79,000 |
| | RUNOFF COEFFICIENT | 1.00 | 0.85 | 0.75 | 0.20 | **1.00** |
| **TABLE 3B** | **WEIGHTED RUNOFF COEFFICIENT, C** | | | | | |
| | SURFACE TYPE[1] | ROOF[2] | PAVT & WALKS | OTHER[3] | GRASS & SOFT SCAPE | TOTAL |
| SINGLE TENANT SCENARIO | AREA, % | 100.0% | 0.0% | 0.0% | 0.0% | 100.0% |
| | SURFACE AREA, SF | 79,000 | 0 | 0 | 0 | 79,000 |
| | RUNOFF COEFFICIENT | 1.00 | 0.85 | 0.75 | 0.20 | **1.00** |
| **TABLE 3B** | **WEIGHTED RUNOFF COEFFICIENT, C** | | | | | |
| | SURFACE TYPE[1] | ROOF[2] | PAVT & WALKS | OTHER[3] | GRASS & SOFT SCAPE | TOTAL |
| MULTI TENANT SCENARIO | AREA, % | 100.0% | 0.0% | 0.0% | 0.0% | 100.0% |
| | SURFACE AREA, SF | 79,000 | 0 | 0 | 0 | 79,000 |
| | RUNOFF COEFFICIENT | 1.00 | 0.85 | 0.75 | 0.20 | **1.00** |

**NOTES:**

| | |
|---|---|
| * | **Please complete separate tables for surface areas that discharge to combined sewer system or separate storm sewer/direct discharge to waterbody.** |
| 1 | Runoff coefficients for each surface type are as per NYCDEP. |
| 2 | Total roof areas onsite. |
| 3 | Identify any other surfaces onsite and obtain runoff coefficients from NYCDEP. |

**EXISTING:** IDENTIFY WHERE STORMWATER DISCHARGING TO (**COMBINED SEWER**, STORM SEWER, DIRECT DISCHARGE/OVERLAND FLOW, OR INFILTRATING ONSITE)

| SITE | Rainfall, in | Duration, hr | Total Area (A), acre | Weighted Runoff Coefficient (C) | Stormwater Runoff , MG | Sanitary to CSS , MG |
|---|---|---|---|---|---|---|
| EXISTING (15 PENN PLAZA) | 0.00 | 3.80 | 1.81 | 1.00 | 0.000 | 0.0618 |
| | 0.40 | 3.80 | 1.81 | 1.00 | 0.020 | 0.0618 |
| | 1.20 | 11.30 | 1.81 | 1.00 | 0.059 | 0.1838 |
| | 2.50 | 19.50 | 1.81 | 1.00 | 0.123 | 0.3172 |

**PLAN:** IDENTIFY WHERE STORMWATER DISCHARGING TO (**COMBINED SEWER**, STORM SEWER, DIRECT DISCHARGE/OVERLAND FLOW, OR INFILTRATING ONSITE)

| SITE | Rainfall (I), in | Duration, hr | Total Area (A), acre | Weighted Runoff Coefficient (C) | Stormwater Runoff , MG | Sanitary to CSS , MG* |
|---|---|---|---|---|---|---|
| NO BUILD SCENARIO (15 PENN PLAZA) | 0.00 | 3.80 | 1.81 | 1.00 | 0.000 | 0.0220 |
| | 0.40 | 3.80 | 1.81 | 1.00 | 0.020 | 0.0220 |
| | 1.20 | 11.30 | 1.81 | 1.00 | 0.059 | 0.0654 |
| | 2.50 | 19.50 | 1.81 | 1.00 | 0.123 | 0.1129 |
| SINGLE TENANT SCENARIO (15 PENN PLAZA) | 0.00 | 3.80 | 1.81 | 1.00 | 0.000 | 0.0396 |
| | 0.40 | 3.80 | 1.81 | 1.00 | 0.020 | 0.0396 |
| | 1.20 | 11.30 | 1.81 | 1.00 | 0.059 | 0.1179 |
| | 2.50 | 19.50 | 1.81 | 1.00 | 0.123 | 0.2034 |
| MULTI TENANT SCENARIO (15 PENN PLAZA) | 0.00 | 3.80 | 1.81 | 1.00 | 0.000 | 0.0397 |
| | 0.40 | 3.80 | 1.81 | 1.00 | 0.020 | 0.0397 |
| | 1.20 | 11.30 | 1.81 | 1.00 | 0.059 | 0.1181 |
| | 2.50 | 19.50 | 1.81 | 1.00 | 0.123 | 0.2038 |

Note: * These calculations reference sanitary sewage flows for the existing, no build, and build scenarios.