

CURRENT FLOWS AND TRENDING

Wastewater flow values are dynamic – they vary over the course of the day, week, month and year. Wastewater flows in the Concord system are measured and recorded at several locations: the West Concord/Assabet Pump Station, the Lowell Road Pump Station, the influent of the WWTP and the effluent of the WWTP. In addition, at certain times of the year, flow meters are installed in various manhole locations to measure specific sewer subarea flow. For this evaluation, the focus will be on the WWTP effluent flow values, so they may more directly be compared with the permit limit, which is based on effluent flow to the Concord River.

Tracking both the monthly average daily flow (ADF) and the 12-month rolling average flow provides valuable information for wastewater planning, but the two measures are not directly comparable. The monthly ADF is an average of the daily flows recorded during the course of one month. The 12-month rolling average flow is calculated by averaging the monthly ADF for the reporting month with the monthly ADFs from the eleven months prior. The 12-month rolling average is the quantity that the Town reports monthly to the DEP and EPA. As indicated previously, the discharge limit in the NPDES permit is a 12-month rolling average of 1.2 mgd. Therefore, for every month that the ADF is more than 1.20-mgd, a corresponding less than 1.20-mgd month must occur in the 12-month period to stay within the permit limitation. While forecasting future 12-month rolling average flows is a challenge, given differing weather patterns from year to year, this measure remains a requirement of the NPDES permit monitoring reports.

Figure 3 - Concord WWTP Effluent ADF & Rolling Average Trending, May 2004 through October 2007 depicts the recent flow variations and shows the normalizing effect of the 12-month rolling average. Interpretation of the data depicted in this graphical representation reveals that the highest reported

average daily flow (ADF) value in recent years is approximately 1.097-mgd. This flow value accounts for a number of flow sources that were not previously connected to the sewer system, including: 1) Phase 1 Sewer properties who have tied in to date, 2) Subarea EB-3 (Walden Street Area), which connected to the sewer system in advance of its phase, and 3) infill projects that have been approved and connected.

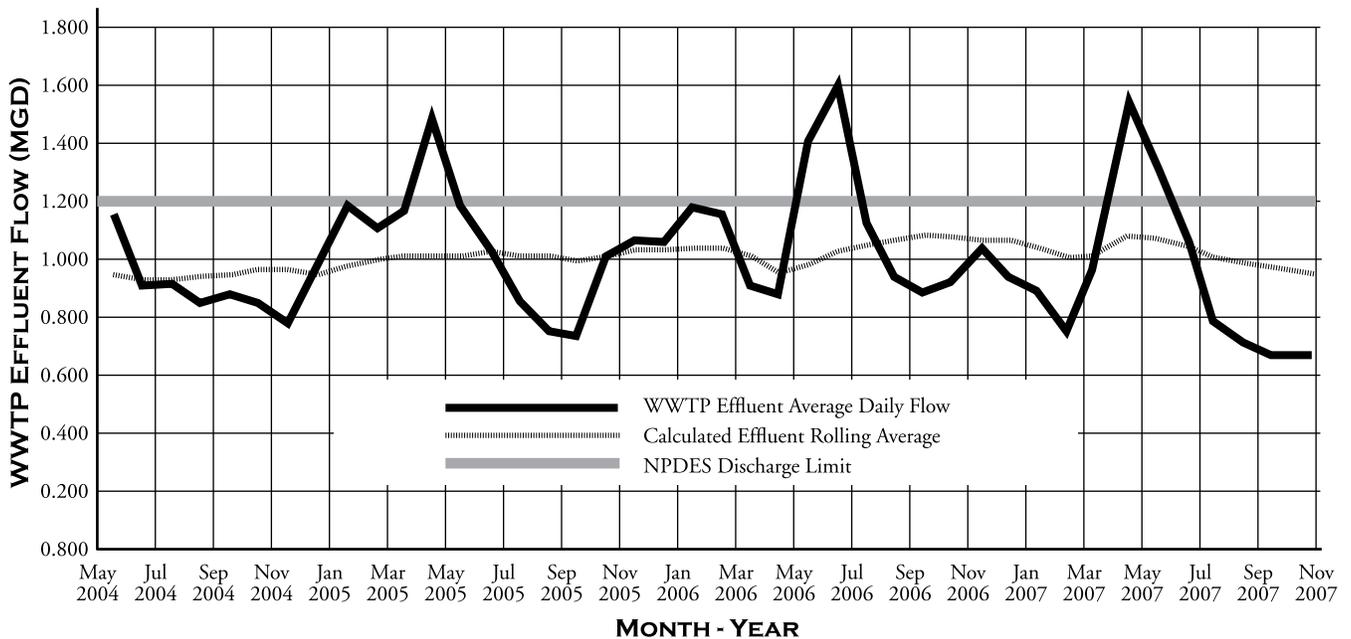
Review of total “committed” capacity, however, must also account for flow allocations for those properties with a right to contribute flow that have not yet made a physical connection to the system. These properties include: 1) those in the Phase 1 and other previously sewer neighborhoods who have not yet tied in, 2) larger developments such as Warner Woods and Conant Crossing, which may not yet be fully occupied, 3) ongoing permitted projects at New England Deaconess Hospital and Emerson Hospital, and 4) other development or re-development projects that have been approved for connection and have paid associated fees but have not yet connected. Properties that fall into the second, third and fourth categories were to be captured in the “infill” capacity allocation in the CWMP. To date, however, infill projects have resulted in over 52,000 gpd of approved new flows, exceeding the 49,875 gpd infill allocation that was to account for growth in the sewer areas over the 20-year planning period. This degree of infill has occurred over a period of just four years.

In addition to actual flow additions to the sewer system, readers should note that changes to the treatment processes as part of the WWTP upgrades are anticipated to decrease current flow losses that occur as wastewater moves through the plant. These losses could be as high as 50,000 gpd or more, when averaged over an entire year. Therefore, even with no increase in actual flows, the ADF measured at the plant effluent sampling point could increase over existing conditions when the newly improved

treatment processes begin to be used. The anticipated change is difficult to quantify and thus has not been figured into the projected future flows, but

the potential impact of this flow change should be recognized.

FIGURE 3
CONCORD WWTP EFFLUENT ADF AND ROLLING AVERAGE
TRENDING MAY 2004 THROUGH OCTOBER 2007



FLOW ALLOCATIONS

Table 2 below summarizes current WWTP flows plus the allocations for the approved, impending contributors. Note that these allocations are similar to those presented in Table 1, however due to the time that has elapsed since the CWMP, portions of the previous allocation values have been realized and are included in the current WWTP flow estimation (1.097 mgd).

The conclusion drawn from this most recent flow data is that the current wastewater flows com-

pared with near-future anticipated flows from the construction of CWMP Phase 1 area connections will bring the average daily flows to 100% of the WWTP discharge capacity. Equally important, capacity needed to accommodate planned flows from CWMP Phase 3 or 4 will require extraneous I/I flows to be removed commensurate with the added flows from sewer extensions. Finally, as there has never been sufficient capacity allocated to meet additional flow for all existing parcels identified with off-site treatment needs, it follows that no capacity at the WWTP exists for future development, redevelopment, or expansion.

TABLE 2
CURRENT CONCORD WASTEWATER FLOW ALLOCATION

Potential Flow Contributor	Estimated Average Daily Flow (ADF) Value MGD
Current WWTP Flow ⁽¹⁾	1.097
Remaining Sewer Connections CWMP Phase 1	0.079
Recent Sewer Area Infill/Flow Increases (yet to connect)	0.014
Previously Bettered Sewer Parcels ⁽²⁾ (yet to connect)	0.007
SUBTOTAL	1.197 MGD
CWMP Phase 2, Phase 3 and Phase 4 Sewer Extensions	0.098
TOTAL	1.295 MGD

(1) Maximim annual 12-month rolling average daily flow at WWTP from May 2004 to October 2007.

(2) Excluding parcels in CWMP phases 1, 2, 3 & 4 sewer extension areas.