



Jefferson County West Virginia

Public Information

TO: JEFF BRADY



City of Charles Town
City of Ranson and the
Jefferson County
Public Service District (PSD)

Report On

Sewer System Evaluation Survey

October, 1997

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Executive Summary

Chester Engineers has completed a Sewer System Evaluation Survey (SSES) for the City of Charles Town (Charles Town), City of Ranson (Ranson), and the Jefferson County Public Service District (PSD). All three jurisdictions convey their sewage to the City of Charles Town's Wastewater Treatment Plant (WWTP). The SSES included mapping the sewer collection systems, completing a theoretical infiltration and inflow (I&I) analysis, identifying potential sump pump connections, conducting late night flow monitoring during wet weather periods, manhole inspections, smoke testing, and internal television inspections. The study also included an analysis of the accuracy of the WWTP effluent flow meter.

During the SSES approximately 40 I&I sources (primarily infiltration) were discovered within the public right of way which had flows that could be reasonably estimated. The easily quantifiable I&I sources were observed contributing approximately 30,000 gallons per day (GPD) of flow during non-rainfall periods. The estimated cost to repair these I&I sources is approximately \$50,000. Because the majority of I&I associated with the 40 sources comes from 14 defects, approximately 93% of the identified I&I flow can be eliminated for approximately \$16,000.

Thirty-seven (37) other potential I&I defects (primarily inflow) were found within the right of way, but the quantity of associated I&I could not be reasonably estimated. Each of these defects were classified as high, moderate, or low potential I&I sources based on the type of defect and the estimated drainage area. These defects could account for several hundred thousand gallons per day of inflow during a rainfall event with the exact flow contribution a function of the length and significance of the storm event. The estimated total repair cost for these defects is approximately \$28,000. The estimated repair costs to correct the defects classified as 'high' potential inflow sources is approximately \$14,000.

An additional 99 "private" (outside of the right of way) defects were also discovered during the SSES. The I&I contribution of 87 of these defects could be reasonably estimated at approximately 64,000 GPD. Seventy-four (74) of the 87 defects have an estimated repair cost of \$79,000. The other 13 defects discovered during the smoke testing require further investigation before a repair cost can be estimated. The defects in which an I&I contribution could not be estimated were all sump pump connections, however they are classified as "high" potential sources. The estimated repair costs to disconnect the 12 known sump pump connections is \$6,000.

In addition to the I&I related defects, several non-I&I related defects were also identified, which should be addressed by the jurisdictions. These defects included insufficient access steps in manholes, root penetrations through sewer mains, and non-leaking, cracked or broken pipes. Numerous sewer segments were also heavily fouled with organic, grease, and debris. Chester recommends that these defects be adjusted, and a regular sewer line cleaning program be established by each jurisdiction. In addition, we recommend that grease interceptors to be required to be installed and maintained at all restaurants connected to the collection systems.

After completing a majority of the study's field work and observing less I&I flow and fewer sources than anticipated based on the record WWTP flows, it was suspected that the effluent flow meter at the WWTP might be inaccurately recording flows higher than the actual. A subsequent evaluation of the flow meter, which is fully discussed in the *Facility Plan WWTP Upgrade Charles Town, WV*, determined that the WWTP's effluent flow meter was recording flows approximately 100% higher than actual. Examination of the WWTP flow data suggests that the meter has probably been incorrect since late 1995. As such, except where noted, all WWTP flows referenced in the report have been "adjusted" for the flow meter error.