Planning for the 5-Year Plus Design Storm

The Village Creek Wastewater Treatment Plant Assessment and Hydraulic Capacity Evaluation

November 19, 2010
AGENDA

• Background
  – Wastewater Master Plan Status
  – Flow Monitoring (Collection System and Village Creek WWTP)
  – Projected Population & Wastewater Flows
  – Use of Calibrated Wastewater Model for CIP Development

• Storm of the Decade Impact at the Village Creek WWTP
  – September 8th Storm Event
  – Resulting Peak Flows
  – Operational Impacts

• Impact on the Wastewater CIP Development
  – Overall Capacity Evaluation
  – Interrelationship between Collection System & WWTP
Funding and Cost Recovery Options

COMPREHENSIVE CAPITAL IMPROVEMENT PLAN

WASTEWATER MASTER PLAN PROCESS STATUS

Strategic Planning

Wastewater Model Development

GIS Coordination

Population Data Review & Wastewater Flow Projections

Flow Monitoring & Model Calibration

Risk Based Assessment

Wastewater Collection Planning

Wastewater Treatment Planning

Funding and Cost Recovery Options
CITY SERVICE AREA POPULATION GROWTH HAS AVERAGED 25,000 PEOPLE PER YEAR. OVER THE LAST DECADE.
VILLAGE CREEK WWTP PROJECTED WASTEWATER FLOWS

Village Creek Wastewater Treatment Plant
Projected Wastewater Peak Flows (MGD)

Year

Projected flows (MGD):
- Average Day Flow
- Peak 2-Hour Flow (2-year, 24 hour Design Storm)
- Peak 2-Hour Flow (5-year, 6-hour Design Storm)
• Temporary Flow Meters Installed Throughout Collection System (47 Meters) from 10/2008 to 06/2009.

• Significant Storm Events Measured from Flow Meters
  – 11/10/08 -- 2.0 inches
  – 05/02/09 -- 2.55 inches
  – 05/16/09 -- 1.80 inches
• Temporary Flow Meters Surrounding the Plant Installed from 10/2008 – 06/2009 and 01/2010 to Present

• Storm of the Decade Measured by Flow Meters
  – 09/08/10 – 7.35 inches
CIP Being Planned for Future Overloaded Areas
STORM OF THE DECADE
SEPTEMBER 8\textsuperscript{TH} 2010

Rainfall Across Eastern Tarrant County Averaged 5 – 8 inches of Rain
Overlooking Village Creek from Green Oaks Blvd.
• Temporary Flow Meters Surrounding the Plant Installed from 10/2008 – 06/2009 and 01/2010 to Present

• Storm of the Decade Measured by Flow Meters
  – 09/08/10 – 7.35 inches
WHY THE LAG?

Village Creek WWTP
Flow Monitoring Results

Peak Flow: 126 MGD
Peak Flow: 123 MGD
Peak Flow: 113 MGD
Peak Flow: 18 MGD
### YEAR 2010

<table>
<thead>
<tr>
<th>Model Peak Flows at Village Creek WWTP for Design Storm</th>
<th>Peak Flow (MGD)</th>
<th>Rainfall (inches)</th>
<th>Storm Event</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>355</td>
<td>4.0</td>
<td>5 Year 6 Hour</td>
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<th>Measured Peak Flow at Village Creek WWTP during September 8th Storm Event</th>
<th>Peak Flow (MGD)</th>
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<td>380</td>
<td>5.0 – 8.0</td>
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<th>Projected Peak Flows without Restrictions at Village Creek WWTP during September 8th Storm Event</th>
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EXTENDED MODEL THROUGHOUT VCWWTP TO PROVIDE DYNAMIC COMBINED SIMULATION OF TREATMENT CAPACITY
INTERRELATIONSHIP BETWEEN COLLECTION SYSTEM & WWTP
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CONCLUSIONS

• Collection system modeling developed design storm for Village Creek WWTP

• Dynamic hydraulic model carried into treatment facility
  – Dynamic connection to collection system hydraulics
  – Treatment hydraulic improvements tied to collection system hydraulic improvements

• Future treatment CIP can be added to InfoWorks model
  – Primary clarifier improvements
  – Peak flow management/storage basin
  – High Rate Clarifier operation
Questions?

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