City of Kyle, Texas

Wastewater Collection System Hydraulic Model Final Report

Burgess & Niple, Inc.

May 2016

REPORT

WASTEWATER COLLECTION SYSTEM HYDRAULIC MODEL FINAL REPORT

CITY OF KYLE, TEXAS

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Prepared By:

Burgess & Niple, Inc.
Austin, Texas

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Model Results

1.1 - Existing System Observed Dry Weather Event Model Results
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Executive Summary

Burgess & Niple, Inc. (B&N) was engaged by the City of Kyle to develop a hydraulic model of the wastewater collection system. The purpose of this report is to present the hydraulic model building methodology and process employed for developing the hydraulic wastewater model and resultant recommendations for the City of Kyle.

Hydraulic Modeling Software

SewerGEMS® hydraulic modeling software developed by Bentley Systems, Inc. was selected to perform the hydraulic analysis of the entire wastewater collection system serving the City of Kyle. The SewerGEMS® model utilizes population in conjunction with a weekday, weekend, or design Dry-Weather Flow (DWF) profile in order to generate base wastewater flow for any time period. Rainfall dependent inflow and infiltration (RDII) is computed using defined contributing areas and inflow parameters for volume and rate.

Hydraulic Modeling Network

The model network is a description of the physical features and geometry of the City of Kyle's sanitary sewer system. It includes, but is not limited to, manhole location, rim elevation, size, and contributing drainage area; sewer diameter, length, slope, inverts, and roughness; lift station pump output and operating levels. For the wastewater model to simulate a real collection system, pipe and node data must be accurate to the actual collection system. Geospatial, physical, and operational properties are assigned to each node and pipe in the system. Where data could not be located either in the geodatabase provided by the City or in record drawings, B&N field crews located the manholes of interest and collected required data.

Building the Network in SewerGEMS®

Geospatial, physical, and operational properties of the existing system are created by importing manhole and pipe shapefiles from GIS into SewerGEMS®. Attribute data from the GIS is used to assign physical and operational properties to each manhole and pipe in the system. The lift station wet wells are imported into the model and geospatially placed. Subcatchment areas are drawn in ArcGIS and denote the area between manholes that contribute to wastewater loading as well as rainfall dependent inflow and infiltration (RDII). These are used in combination with population projections to generate wastewater within the model. The constructed wastewater hydraulic model for the City of Kyle includes 2470 nodes, 2473 links, 10 lift stations (two lift stations owned by Hays CISD and one is owned by the Immanuel Baptist Church), representing approximately 634,396 linear feet of wastewater pipe.

Lift Station Building

Each lift station is built directly in SewerGEMS®, with wet wells and pumps assigned to the pumping station. Once all the components of the lift station are created inside the model, the properties of each lift station are programed to simulate actual operation. To ensure each lift station is modeled according to actual operation, B&N crews conducted a lift station evaluation

of all lift stations operated by the City included in the model. Top and bottom elevations, cross sectional area/shape, minimum elevation, all pumps-off and pump-on elevations, incoming pipes inverts and sizes, pump curves and suction inverts are all included in the model.

Wastewater Flow Monitoring and Data Analysis

B&N performed wastewater flow and rainfall monitoring in the City of Kyle wastewater collection system. The monitoring locations were determined through map study of the system, hydraulic model needs, and the results of field site investigation conducted by B&N. Ten (10) flow monitors were installed in the system from February 11th to March 24, 2015. Five (5) rainfall gages were installed to capture rainfall during the monitoring period. All temporary gravity monitoring equipment was calibrated prior to installation and at regular intervals during the monitoring period. Tipping bucket rain gages were maintained at five sites. The results of the wastewater system flow and rainfall monitoring are provided in Section 4.0.

Dry Weather Calibration

A model is considered to be dry weather calibrated when the base diurnal-flows in the model are within ten percent of the actual measured flows during the dry period for both volume and rate. Flow meters measure base flows in the collection system during periods where the system is not affected by rainfall. The flow meter basins (see Figure 4.2.4) are an aggregate of the subcatchments. Measuring wastewater flows at multiple points in the collection system during a dry weather period reveals actual wastewater demands on the system and is used to develop base flows in the system for each basin and subcatchment. Subcatchments are categorized as, residential, commercial, industrial, school, hospital, etc.; each designation has a different diurnal pattern and a different average daily load per acre. Base wastewater flow within the model is generated using population per acre. The population within each subcatchment is assigned a wastewater profile comprised of an average per capita flow rate and hourly multipliers. In dry-weather model calibration, the representative per capita flow rates and hourly multipliers are adjusted to match the dry-weather flow meter measured.

Wet Weather Calibration

Wet weather calibration adjusts various parameters in the model to correctly simulate flows measured in the actual system during an observed rain event. Ten (10) flow meters measured flows during a storm that occurred March 8-9, 2015. This rain event was isolated (no antecedent soil conditions) and the flow meter data showed flows that are consistent with RDII (rain induced inflow and infiltration) and was used to calibrate the model for wet weather conditions. This rainfall event resulted in inflow and infiltration into the collection system (see Section 4.2) and was used to calibrate the model for wet weather. During wet weather calibration, various parameters associated with the subcatchments developed during the model building exercise were adjusted until the rate and volume of RDII into the collection system and the wet weather represented the system performance during flow monitoring.

Design Storm

Modeled design storms are developed based on regionally accepted durations and frequencies; most hydraulic models developed for municipalities in Texas utilize a 5-year 6-hour design storm for capacity analysis. A synthetic 5-year 6-hour design storm was developed for this hydraulic model. Isohyetal maps in Technical Paper No. 40 (TP-40) published by the U.S. Department of Commerce show that a 5-year 6-hour storm for the City of Kyle is defined as 4.3 inches of rain in 6 hours. A TP-40 rainfall intensity curve was created for a cumulative rainfall of 4.3 inches of rain over a 6 hour period and the hyetograph utilized for the model. The design storm created in the model can be used to predict system performance in the collection system during such a rain event.

Identification of System Deficiencies

One of the main reasons to conduct a hydraulic modeling exercise on a wastewater collection system is to identify major areas where hydraulic restrictions exist through the evaluation of the dry and wet weather modeled flow regimes. Under dry weather conditions, the model results indicate that there are no major problem areas in the current collection system. A dry/wet weather analysis was then developed which focused on evaluating hydraulic performance of the sanitary sewer system due to increasing population under both dry and wet weather conditions. This analysis enables the determination of capacity improvements for dry weather system capacity needs based on system expansion and population increases. The wet weather simulations were run using saturated antecedent ground conditions, the 5-year 6-hour design storm, and the RDII factor developed during wet weather calibration of the model.

Development Scenarios

Using alternatives analysis in SewerGEMS®, B&N projected future demands during dry and wet weather and compared the system performance when adding new developments and/or additional pipe. Alternatives analysis allows for exploration of the entire wastewater system when adding any number of new developments and is used as a tool for determining what improvements need to be constructed in order to prevent hydraulic bottlenecks, surcharged pipes, and manhole overflows. Upon completion of the addition of known developments to the model, B&N prepared recommendations for improvements to the collection system.

Known New Developments

Information needed to run simulations for a new development in the model include: 1) Total developed land area base loading or total Living Unit Equivalents (LUEs), and; 2) Connection point(s) into the existing wastewater system, and; 3) Any large or special wastewater generators. This information is used to develop subcatchments (similar to the subcatchments prepared for the existing collection system) for the proposed development. A standard set of parameters are developed to create the volume and rate of allowable I/I entering the system, combined to determine the new wastewater loading that will be generated by the new development during wet weather events. Proposed land use and property zoning classifications are used to estimate populations and confirm LUE computations, with the

proposed development connected to the existing system at a geospatially feasible location, simulations run for dry and wet weather, and a 5-year 6-hour design storm. Known future developments that were modeled include:

- Anthem
- Perry Blanton Addition
- Plum Creek's Final Phase
- Brooks Crossing
- Post Oak full build- out
- Cool Springs
- Kensington Trail Final Phase
- Hays Commerce Park
- Creekside at Bunton Creek
- Blanco River Ranch
- La Salle
- Plum Creek Apartments
- Creekside Village
- Villas at Creekside Phase 2
- Kyle Estate
- Sunset Hills
- Meadow & Kyle Final Phases
- Bunton Creek Final Phases
- Cypress Forest
- Aztec
- Vista at Plum Creek
- Oaks on Goforth Apartments
- Brookside Phase 2
- Lehman Tract
- The Strand Apartments
- Crosswinds MUD

Recommendations

All recommendations for system improvements are based upon the aggregate of all of the known developments and model run scenario results. The recommended system improvements resulting from the model scenarios follow the existing pipe alignments (from both existing record drawings and collected field data) in the system and associated slopes, and are to be used by the City of Kyle for planning purposes only. Preliminary engineering including final pipe sizing and slope, route alignments and pipe design phases have not been performed and are not a function of the wastewater hydraulic modeling scope. Phasing of system improvements should be performed as a function of known development timelines and associated population growth projections.

Wastewater Treatment Plant Improvement Phase 1 - Project includes upsizing fourteen (14) wastewater pipe segments (upsizing existing 30 to 54 inches). Table 7.1.1 lists the known developments that are drivers of this improvement project and table 7.1.2 includes the original and proposed pipe.

Wastewater Treatment Plant Improvement Phase 2 - Project includes upsizing eight (8) existing wastewater pipe segments from 30 inches to 54 inches. Table 7.2.1 lists the known developments that are drivers of this improvement project and table 7.2.2 shows the original and proposed pipe.

Four Seasons Farms Interceptor Improvement - Project includes upsizing nineteen (19) existing wastewater pipe segments from 18 inches to 24 inches. All of the developments used in the model for this scenario are listed on Table 7.3.1 and Table 7.3.2 shows the original and proposed pipe. These improvement recommendations are primarily driven by the addition of the La Salle, Blanco River Ranch, Cypress Forest, Perry Blanton Developments, Post Oak Final Phases, Brookside Phase 2, and Villas at Creekside Phase 2.

Center Street Village Wastewater Improvement - Project includes upsizing two (2) existing wastewater pipe segments from 10 inches to 18 inches, twenty five (25) wastewater pipes from 12 inches to 18 inches, and four (4) wastewater pipes from 18 inches to 21 inches. All of the developments used in the model for this scenario are listed on Table 7.4.and Table 7.4.2 shows the original and proposed pipe. This improvement project is located near IH-35 adjacent to old town Kyle. These recommendations are primarily driven by the addition of the proposed Blanco River Ranch, Cypress Forest, and Perry Blanton developments.

North Trails Interceptor Improvement - Project includes upsizing eight (8) existing wastewater pipe segments from 24 inches to 36 inches. All of the developments used in the model for this scenario are listed on Table 7.5.1 and Table 7.5.2 shows the original and proposed pipe. These recommendations are driven by the addition of the Crosswinds Development, the Final Phases of the Meadows at Kyle development, Anthem, Plum Creek Final Phase, Hays Commerce Park, The Strand Apartments, Sunset Hills, Kensington Trails Final Phases, Trails at Plum Creek Apartments, Creekside Village, and Brooks Crossing.

Steeplechase Interceptor Improvement - Project includes upsizing twenty-nine (29) existing wastewater pipe segments from 21 inches to 30 inches. All of the developments used in the model for this scenario are listed on Table 7.6.1 and Table 7.6.2 shows the original and proposed pipe. These recommendations are driven by Anthem and the Final Phases of the Plum Creek Development. Other developments that also increase the flow through this line include, Trails at Plum Creek Apartments, Vista at Plum Creek Apartments Phase 2, and parts of Creekside Village t, Brooks Crossing and the Creekside Village Developments.

Plum Creek Interceptor Improvement Phase 1 - The Plum Creek Interceptor improvement Phase 1 Project includes upsizing seventeen (17) existing wastewater pipe segments from 12 to 18 inches. All of the developments used in the model for this scenario are listed in Table 7.7.1 and Table 7.7.2 shows the original proposed pipe. This project runs east along a drainage easement from the proposed Brooks Crossing development to the main interceptor and the recommendations are driven by the addition of the Brooks Crossing and the Creekside Village developments.

Plum Creek Interceptor Improvement Phase 2 - Project includes upsizing eight (8) existing wastewater pipe segments from 21 to 24 inches. All of the developments used in the model for this scenario are listed on Table 7.8.1 and Table 7.8.2 shows the original and proposed pipe. This project runs along the east side of the railroad track near the existing Plum Creek subdivision. These recommendations are driven by the addition of the Anthem and the Final Phases of the Plum Creek Developments. Other developments that influence the need to upsize these lines include the Trails at Plum Creek Apartments, Vista at Plum Creek Apartments Phase 2, and portions of the Creekside Village Development.

Plum Creek Interceptor Improvement Phase 3 - Project includes upsizing twenty four (24) existing wastewater pipe segments from 10 and 15 inches to 21 inches. All of the developments used in the model for this scenario are listed on Table 7.9.1 and Table 7.9.2 shows the original and proposed pipe. These recommendations are driven by the addition of the Anthem Development and the Final Phases of the Plum Creek Development, assuming that the Anthem and Plum Creek final phase developments will discharge to the existing system at Kohlers Crossing adjacent to Kirby Lane at manhole 169.

Dacy Lane Wastewater Improvement - Project includes upsizing seven (7) existing wastewater pipe segments from 10 inches to 18 inches. All of the developments used in the model for this scenario are listed on Table 10.10.1 and Table 7.10.2 shows the original and proposed design pipe. This project runs along Dacy Lane between Bebee Road and the existing 27 inch interceptor at manhole 12. These recommendations are primarily driven by the Crosswinds Development and the Final Phases of the Meadows at Kyle Development.

Waterleaf Wastewater Improvement - Project includes upsizing five (5) existing wastewater pipe segments from 8 inches to 10 inches. All of the developments used in the model for this scenario are listed on Table 7.11.1 and Table 7.11.2 shows the original and proposed pipe. This project runs east along New Bridge Drive, north along Japonica Ct, and east along Abundance Lane. These improvement recommendations are primarily driven by the addition of the Cool Springs Development. These recommendations are assuming that the Cool Springs development will tie its wastewater lines into the existing system at New Bridge Drive and Jasmine Cove. **The Cool Springs Development route was modified following the model completion and report; this improvement is no longer required.**

Southlake Lift Station Improvement - Project is designed to increase the lift stations' overall capacity and to address known operations, maintenance, and structural issues. All of the developments used in the model for this scenario are listed on Table 7.12.2 and Table 7.12.1 shows the average daily flow and the peak flow requirements that the Southlake lift station will need to convey flow from all listed new developments and existing infrastructure. These recommendations are primarily driven by Crosswinds, Meadows at Kyle Final Phases, Sunset Hills, Hays Commerce Park, Kensington Trails Final Phases, and Strand Apartments.

Cost Estimates for Capital Improvement Projects

In determining an estimate of probable costs for the improvement projects listed in this report, B&N incorporated an industry standard cost estimation methodology. This method does not consider items such as utility relocation and right-of-way acquisition. This creates a baseline to compare and prioritize system improvement recommendations presented by the City of Kyle to those presented in this report. The costs presented in the report are based on Table 8.0.1 and are calculated using 2015 dollars. Table E.0.1 on the following page summarizes estimated costs for each individual improvement project discussed in this report. **These improvements are the result of engineering analysis of the model results and not the result of any**

particular design criteria analysis. The recommendations are designed to reduce or eliminate sanitary sewer overflows. Future hydraulic model analysis should also be configured to examine and explore various combinations of system improvements and pipe line routes that will serve the entire City of Kyle wastewater service area. The results from this modeling engagement are focused on required improvements to serve known developments.

Table E.0.1: Estimated Construction Costs for Recommended Improvement Projects[1]

Improvement Project	Pipe Size (inches)	Total Footage (LF)	Estimated Manhole Number	General Topography	Depths (feet)	Estimated Preliminary Construction Cost	Estimated Engineering Cost	15% Contingency	Total Estimated Cost
WWTP Interceptor Improvement Phase 1	54	6,060	21	Grass/Open Field	11-17	$2,598,900	$389,900	$448,400	$3,437,200
WWTP Interceptor Improvement Phase 2	54	4,080	14	Grass/Open Field	9-18	$1,745,400	$261,900	$301,100	$2,308,400
Four Seasons Farms Interceptor Improvement	30	6,320	22	Grass/Open Field	6-30	$2,337,300	$350,600	$403,200	$3,091,100
Center Street Village Wastewater Improvement	18 & 21	6,409	25	Grass/ Adjacent to Roadway	5-15	$1,088,200	$163,300	$187,800	$1,439,300
North Trails Interceptor Improvement	36	4,340	15	Grass/Open Field	9-26	$1,614,520	$242,200	$278,600	$2,135,400
Steeplechase Interceptor Improvement	30	7,380	28	Grass/Asphalt Road	6-12	$4,873,800	$731,100	$840,800	$6,445,700
Plum Creek Interceptor Improvement Phase 1	18	4,310	18	Grass/Drainage Easement	6-15	$726,400	$109,000	$125,400	$960,800
Plum Creek Interceptor Improvement Phase 2	24	3,460	12	Grass/Along Rail Road	6-15	$992,900	$149,000	$171,300	$1,313,200
Plum Creek Interceptor Improvement Phase 3	21	8,440	29	Grass/ Adjacent to Roadway	6-20	$1,622,000	$243,300	$279,800	$2,145,100
Dacy Lane Wastewater Improvement	18	2,680	9	Grass/ Adjacent to Roadway	5-14	$437,600	$65,700	$75,500	$578,800
Waterleaf Wastewater Improvement	10	1,310	6	Asphalt Road	7-19	$993,300	$149,000	$171,400	$1,313,700
Southlake Lift Station	– – –	– – –	– – –	– – –	– – –	$2,901,500	$435,300	$500,600	$3,837,400
								.	**$25,168,700**

[1] **Costs are presented in 2015 dollars.**

The Waterleaf Wastewater Improvement was recommended based upon the Cool Springs development route to the existing 8-inch pipeline. Following the model completion, a decision was made to connect the Cool Springs development to a 15-inch pipe instead. Map 8.0.1 (see Section 8.0) presents all City of Kyle Recommended Wastewater System Improvements.

1.0 Introduction

Burgess & Niple, Inc. (B&N) was engaged by the City of Kyle to develop a hydraulic model of the wastewater collection system. The purpose of this report is to present the hydraulic model building methodology and process employed for developing the hydraulic wastewater model using the modeling software Bentley SewerGEMS® for the City of Kyle.

The report includes the following:

- Wastewater hydraulic model networks
- Building the pipe and node network in the model
- Wastewater lift station modeling
- Dry-weather model calibration through the application of dry weather wastewater flow monitoring data
- Wet weather model calibration through the application of dry weather wastewater flow monitoring data
- Design storm modeling application and analysis
- Future development model scenarios
- Model results and recommendations
- Capital Improvement Projects with estimated construction costs for each project.

1.1 Hydraulic Modeling Software

SewerGEMS® hydraulic modeling software developed by Bentley Systems, Inc. was selected to perform the hydraulic analysis of the entire wastewater collection system serving the City of Kyle. SewerGEMS® is a fully dynamic hydraulic model that can be used to model wastewater and storm water through a closed and/or open channel network of conveyance structures. The model solves a set of St. Venant equations using an implicit solution technique for gradually varied, unsteady flow. This solution technique, in combination with a self-adjusting simulation time step, yields a highly accurate software model that is capable of handling free surface, reverse flow (backwater flow) and pressurized systems (surcharging) through the use of a complex mathematical model. The SewerGEMS® model utilizes population in conjunction with a weekday, weekend, or design Dry-Weather Flow (DWF) profile in order to generate base wastewater flow for any time period. Rainfall dependent inflow and infiltration (RDII) is computed using defined contributing areas and inflow parameters for volume and rate. The model can be configured to represent a wide range of system inflow and infiltration types and has been proven through extensive use worldwide. The model software's stability allows for the modeling of very complex flow conditions, including nearly all types of sewer structures in fine detail.

1.2 Hydraulic Model Limitations

The hydraulic model for the wastewater collection system was prepared using information gathered from record drawings, sanitary sewer evaluation surveys, and historical mapping data. Several field surveys were conducted to confirm elevations and sizes of key pipelines

and manholes located in the old town part of Kyle. Rim elevations for manholes were estimated from a two-foot contour map provided by the City of Kyle. The invert elevations were determined by measuring the distance from the manhole rim to each invert and subtracting from the rim elevation. Known development data was provided by the City of Kyle for inclusion in the model. This information was subject to rapid and far-reaching changes during the preparation of the model and this report. Before implementing any of the recommendations for system improvements, the City is advised to confirm the data used represents known developments. It should be noted that this hydraulic model is considered to be a stepping stone to a hydraulic model that can be used as the basis for an overall wastewater system master plan. **It is recommended that the City undertake a physical survey of the collection system to accurately map the system assets and develop an up-to-date and complete inventory of the collection system**. Since population density GIS data is not available, an average population per acre equation was used to estimate the population density depending on the type of development and limits the accuracy of the model.

Base wastewater flow within the model is generated using population applied to the model network. Population within each flow meter basin is assigned a wastewater profile comprised of an average per capita flow rate and hourly multipliers. Rainfall dependent inflow and infiltration (RDII) is generated within the model based on the contributing, or drainage area, assigned to each model node and parameters for volume and rate established through model calibration for each flow meter basin. The population data used to generate wastewater flow was provided by the City of Kyle staff and other municipal entities and is based on information from the Texas Water Development Board statewide population projections. The population data for existing and projected conditions was adjusted to take advantage of local knowledge of population growth trends.

2.0 Hydraulic Model Networks

The model network is a description of the physical features and geometry of the City of Kyle's sanitary sewer system. It includes, but is not limited to, manhole location, rim elevation, size, and contributing drainage area; sewer diameter, length, slope, inverts, and roughness; lift station pump output and operating levels.

For the wastewater model to simulate a real collection system, pipe and node data must be accurate to the actual collection system. Geospatial, physical, and operational properties are assigned to each node and pipe in the system. Geospatial properties are stored in ESRI ArcGIS format. Geospatial properties for each pipe include the asset's physical geographical location, as well as the shape of the pipe between nodes. The geospatial property for a manhole is its physical geographical location. Physical properties assigned to each pipe include pipe diameter, pipe length, upstream node ID, downstream node ID, upstream invert elevation, and downstream invert elevation. Invert elevations are based on the flow-line of the pipe. The physical properties associated with a manhole are the rim elevation (elevation of the manhole cover), bottom elevation (elevation of the lowest flow-line), and manhole diameter. Operational properties include the Manning coefficient (n), average daily flow, daily/weekly loading pattern, catchment ID, and the Rainfall Derived Infiltration and Inflow (RDII) method. Each of these properties are gathered and recorded in a shapefile that includes all modeled components of the system.

It is a standard practice to procure pipe and node properties from as-built drawings, if the properties are not already in geodatabase or survey data is not available. Information from the as-built drawings are used as a reference point and better information, such as more survey data, can be used to update the properties of a node or pipe. Node and pipe properties were supplemented by record drawings for this project. Where data could not be located either in the geodatabase provided by the City or in record drawings, B&N field crews located the manholes of interest and collected appropriate data. All pipe and node information developed as a function of the model building exercise is appended to the City of Kyle GIS files.

2.1 Building the Network in SewerGEMS®

Geospatial, physical, and operational properties of the existing system are created by importing manhole and pipe shapefiles from GIS into SewerGEMS®. Attribute data from the GIS is used to assign physical and operational properties to each manhole and pipe in the system. Each pipe is uniquely identified by a Line ID and every manhole is uniquely identified by a node ID. The line ID is created by taking the upstream node ID and appending a ".1" to the end. If there is more than one line leaving a node, then the first pipe starting from north and rotating clockwise is assigned ".1" and the next pipe is assigned ".2" and so on. All the nodes (mainline cleanouts and manholes) are imported into the model first and each node is geospatially placed within the model. The lift station wet wells are imported into the model next and are geospatially placed. Pipes can be linked to each node either explicitly or implicitly. Implicitly linking pipes to the nodes automatically links pipes to nodes that are within a one-foot

proximity. Explicitly linking pipes to nodes uses upstream and downstream node IDs, stored within the pipe shapefile, to state which node each pipe connects to. The pipes and nodes were explicitly linked for this model with the use of the upstream and downstream node IDs. Figure 2.1.1 displays the City of Kyle Wastewater Hydraulic Model Network.

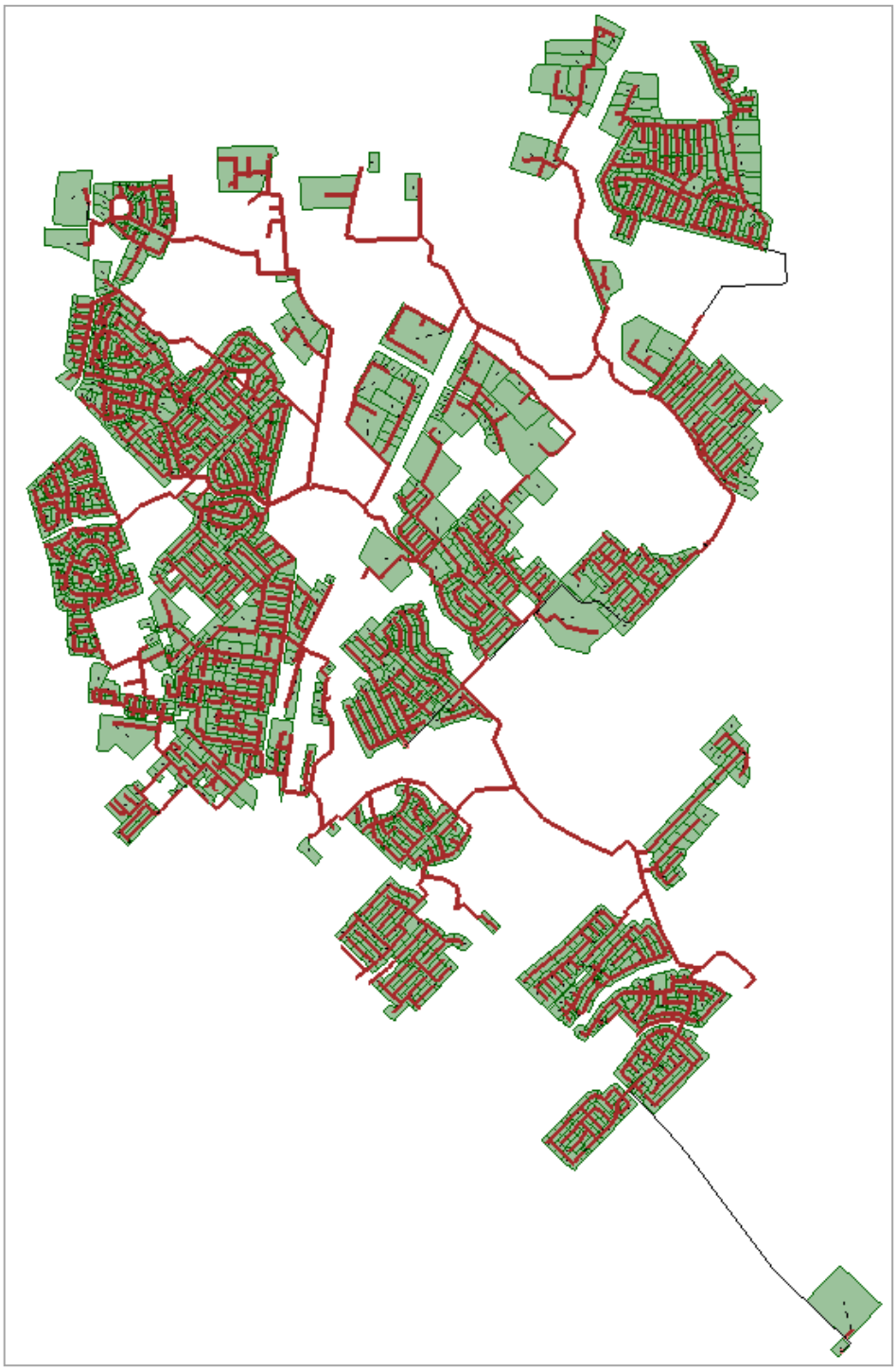


Figure 2.1.1 – City of Kyle Hydraulic Model Network

Nodes are assigned a rim elevation, bottom elevation, and manhole diameter. Pipes are assigned a pipe diameter, pipe length, upstream manhole node ID, downstream manhole node ID, upstream invert elevation, and downstream invert elevation. Using the validation tool in SewerGEMS®, the continuity and validity of the network is tested prior to building the rest of the model.

Subcatchment areas are drawn in ArcGIS and denote the area between manholes that contribute to wastewater loading as well as rainfall dependent inflow and infiltration (RDII). These are used in combination with population projections to generate wastewater within the model. Every subcatchment in the model is assigned to a node ID. This assignment controls the point in the model where wastewater and RDII is loaded. Subcatchments are a representation of homogenous wastewater and RDII generation characteristics. Different subcatchment types are created for residential populations, commercial, industrial centers, and vacant land areas.

The constructed wastewater hydraulic model for the City of Kyle includes 2470 nodes, 2473 links, 10 lift stations, representing approximately 634,396 linear feet of sanitary sewer main. This represents all existing pipes in the collection system.

3.0 Lift Station Modeling

Table 3.0.1 lists the lift stations included in the City of Kyle wastewater hydraulic model:

Table 3.0.1: City of Kyle Wastewater Lift Stations Modeled			
Name	Number of Pumps	Force Main Diameter (in)	Rating (MGD)
Masonwood (Trails) Lift Station	2	6	0.83
Kensington Trails Lift Station	2	6	0.83
Southlake Ranch Lift Station	3	10	2.43
Bradford Meadows Lift Station	2	6	0.16
Indian Paintbrush Lift Station	2	10	1.61
Bunton Creek Lift Station	2	6	0.05
Lehman High School Lift Station (Hays CISD)	2	4	0.03
Hemphill Lift Station	2	6	0.10
Immanuel Baptist Church Lift Station (Private)	2	4	0.03
Barton Middle School Lift Station (Hays CISD)	2	6	2.04

3.1 Lift Station Building

Each lift station is built directly in SewerGEMS®. An example of a modeled lift station is shown in figure 3.1.1. A lift station polygon (light red polygon in the illustration) is drawn around the wet well. Pumps are placed within the lift station polygon. Wet wells and pumps are assigned to the pumping station. A pressure node is placed on the upstream end of the force main and pressure pipes are drawn between the wet well, pumps, and the pressure node to accurately represent the configuration of the actual lift station.

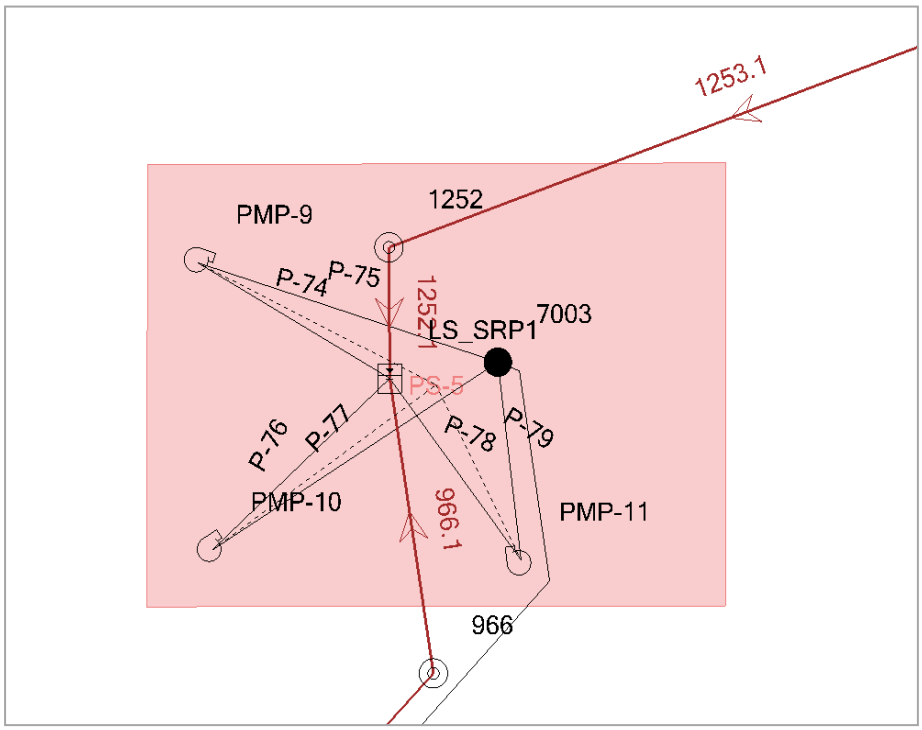


Figure 3.1.1 Lift Station Building in SewerGEMS®

Once all the components of the lift station are created inside the model, the properties of each lift station

are programed to simulate actual operation. To ensure each lift station is modeled according to actual operation, B&N crews conducted a lift station evaluation of every lift station included in the model. During the evaluation, actual operational pumping rates are measured, wet well dimensions were recorded, and incoming and outgoing pipe properties are recorded. Top elevation, bottom elevation, cross sectional area and shape, minimum elevation, all pumps-off elevation, each pump-on elevation, inverts of all incoming pipes as well as their sizes are included in the model for each lift station. Pump curves and suction invert elevations are also included to represent the lift station characteristics.

3.2 Pump Draw Down Testing

Draw down testing is conducted at a lift station to determine current operational parameters of the operational pumps. The goal of the draw down tests is to operate individual pumps and various combinations of pumps.

Volume calculation is a method for applying pump run times to calculate pumping rates and volumes. Taking physical measurements of the wet well length and width and recording each pump on and off level, a volume can be calculated. Applying the time between when a pump turns on and off, the pumping rate can be determined. An example of the calculation for a rectangular wet well is presented below:

Wet Well Length = 9 ft. Wet Well Width = 4 ft. Area = Length x Width Area = 36 sq. ft.

Pump 1 On Level = 3.50 feet Pump 1 Off Level = 2.20 feet Lag Level = 4.5 feet

Volume Between Pump On and Off = Area X (Pump On – Pump Off)
Volume Between Pump On and Off = 36 sq ft. x 1.3 feet = 46.80 cu feet.

Volume in Gallons = 46.80 cu ft. x 7.48 gallons/ cu feet = 350.06 gallons

Wet Well Fill Time = 17.13 minutes

Fill Rate = Wet Well Volume/ Fill Time Fill Rate = 350.06/17.13 minutes = 20.43 gpm

If Pump 1 turns on at 3.50 feet, runs for 2.55 minutes, then turns off at 2.20 feet, the pumping rate is calculated by:

Fill Volume During Pump On = Fill Rate*Pump On Time
Fill Volume During Pump On = 20.43 gpm x 2.55 minutes = 52.10 gallons

$$\text{Pumping Rate} = \frac{\text{(Volume Between Pump On and Off + Fill Volume)}}{\text{Time Pump Ran}}$$

Pumping Rate = (350.06 Gallons+ 52.10 gal.)/ 2.55 minutes = 157.74 gpm

The application of rated pump capacity or volume calculation method in lift station data analysis is a function of the availability of accurate and verifiable data. B&N staff conducted

draw down testing at all 10 wastewater collection system lift stations. Pump Rated Capacity resulting from draw down tests performed are presented in Tables 3.2.1 through 3.2.16 below and on the following pages. The Lift Station Inspection matrix is presented at the end of this section.

Table 3.2.1 FM-BCP4: Lift Station Bunton Creek Estates Calculations	
Wet Well 1 L (ft)	NA
Wet Well 1 W or D (ft)	5.998
Wet Well 1 Area (ft^2)	28.26
Pump #1 Test Avg. Pump Rate (gpm)	21.53
Pump #2 Test Avg. Pump Rate (gpm)	36.66
Pump #1 & #2 Test Avg. Pump Rate (gpm)	32.23

Table 3.2.2 FM-BCP4: Lift Station Bunton Creek Estates Draw Down Test Information				
Draw Downs (Single Pump Operation)	Time	Run/Fill Time	Level Pumped (inches)	Pump/Fill Rate (gpm)
PUMP #1 Start	11:26:00			
PUMP #1 Stop	11:27:00	0:01:00	1.020	
Wet Well Fill Start	11:27:00			
Wet Well Fill Stop	11:29:00	0:02:00	0.210	1.85
PUMP #1 Start	11:29:00			
PUMP #1 Stop	11:30:00	0:01:00	1.120	**21.58**
Wet Well Fill Start	11:30:00			
Wet Well Fill Stop	11:31:00	0:01:00	0.000	-
PUMP #1 Start	11:31:00			
PUMP #1 Stop	11:32:00	0:01:00	1.220	**21.49**
Wet Well Fill Start	11:32:00			
Wet Well Fill Stop	11:34:00	0:02:00	0.000	-
PUMP #2 Start	11:34:00			
PUMP #2 Stop	11:35:00	0:01:00	2.230	**39.28**
Wet Well Fill Start	11:35:00			
Wet Well Fill Stop	11:37:00	0:02:00	0.610	5.37
PUMP #2 Start	11:37:00			
PUMP #2 Stop	11:38:00	0:01:00	2.030	**41.13**
Wet Well Fill Start	11:38:00			
Wet Well Fill Stop	11:40:00	0:02:00	0.100	0.88
PUMP #2 Start	11:40:00			
PUMP #2 Stop	11:41:00	0:01:00	1.630	**29.59**
Average		0:01:22		**16.12**
Draw Downs (Multiple Pump Operation)	Time	Run/Fill Time	Level Pumped (inches)	Pump/Fill Rate (gpm)
Wet Well Fill Start	11:41:00			
Wet Well Fill Stop	11:43:00	0:02:00	0.310	2.73
PUMP #1 & #2 Start	11:43:00			
PUMP #1 & #2 Stop	11:44:00	0:01:00	1.630	**31.44**
Wet Well Fill Start	11:44:00			
Wet Well Fill Stop	11:46:00	0:02:00	0.510	4.49
PUMP #1 & #2 Start	11:46:00			
PUMP #1 & #2 Stop	11:47:00	0:01:00	1.430	**29.68**
Wet Well Fill Start	11:47:00			
Wet Well Fill Stop	11:49:00	0:02:00	0.000	-
PUMP #1 & #2 Start	11:49:00			
PUMP #1 & #2 Stop	11:50:00	0:01:00	2.020	**35.58**
Average		0:01:24		**20.24**

Table 3.2.3 FM-Bradford Meadows: Lift Station Bradford Meadows Calculations	
Wet Well 1 L (ft)	NA
Wet Well 1 W or D (ft)	5.978
Wet Well 1 Area (ft^2)	28.07
Pump #1 Test Avg. Pump Rate (gpm)	108.47
Pump #2 Test Avg. Pump Rate (gpm)	105.47
Pump #1 & #2 Test Avg. Pump Rate (gpm)	111.60

Table 3.2.4 FM-Bradford Meadows: Lift Station Bradford Meadows Draw Down Test Information				
Draw Downs (Single Pump Operation)	Time	Run/Fill Time	Level Pumped (inches)	Pump/Fill Rate (gpm)
PUMP #1 Start	16:45:00			
PUMP #1 Stop	16:46:00	0:01:00	5.380	
Wet Well Fill Start	16:46:00			
Wet Well Fill Stop	16:47:00	0:01:00	0.510	8.92
PUMP #1 Start	16:47:00			
PUMP #1 Stop	16:48:00	0:01:00	5.690	**108.47**
Wet Well Fill Start	16:48:00			
Wet Well Fill Stop	16:49:00	0:01:00	0.510	8.92
PUMP #1 Start	16:49:00			
PUMP #1 Stop	16:50:00	0:01:00	5.690	**108.47**
Wet Well Fill Start	16:50:00			
Wet Well Fill Stop	16:51:00	0:01:00	0.510	8.92
PUMP #2 Start	16:51:00			
PUMP #2 Stop	16:52:00	0:01:00	5.580	**106.55**
Wet Well Fill Start	16:52:00			
Wet Well Fill Stop	17:23:00	0:31:00	12.280	6.93
PUMP #2 Start	17:23:00			
PUMP #2 Stop	17:23:30	0:00:30	2.640	**99.31**
Wet Well Fill Start	17:23:30			
Wet Well Fill Stop	17:24:00	0:00:30	0.310	10.85
PUMP #2 Start	17:24:00			
PUMP #2 Stop	17:24:30	0:00:30	2.850	**110.57**
Average		0:03:35		**57.79**
Draw Downs (Multiple Pump Operation)	Time	Run/Fill Time	Level Pumped (inches)	Pump/Fill Rate (gpm)
Wet Well Fill Start	17:24:30			
Wet Well Fill Stop	17:26:00	0:01:30	0.410	4.78
PUMP #1 & #2 Start	17:26:00			
PUMP #1 & #2 Stop	17:26:30	0:00:30	2.840	**104.16**
Wet Well Fill Start	17:26:30			
Wet Well Fill Stop	17:28:00	0:01:30	0.710	8.28
PUMP #1 & #2 Start	17:28:00			
PUMP #1 & #2 Stop	17:29:00	0:01:00	6.200	**116.75**
Wet Well Fill Start	17:29:00			
Wet Well Fill Stop	17:30:00	0:01:00	0.310	5.42
PUMP #1 & #2 Start	17:30:00			
PUMP #1 & #2 Stop	17:31:00	0:01:00	6.200	**113.89**
Average		0:01:00		**69.70**

Table 3.2.5 FM-Masonwood: Lift Station Masonwood Calculations	
Wet Well 1 L (ft)	NA
Wet Well 1 W or D (ft)	5.990
Wet Well 1 Area (ft^2)	28.18
Pump #1 Test Avg. Pump Rate (gpm)	446.48
Pump #2 Test Avg. Pump Rate (gpm)	448.10
Pump #1 & #2 Test Avg. Pump Rate (gpm)	576.43

Table 3.2.6 FM-Masonwood: Lift Station Masonwood Draw Down Test Information				
Draw Downs (Single Pump Operation)	Time	Run/Fill Time	Level Pumped (inches)	Pump/Fill Rate (gpm)
PUMP #1 Start	8:58:00			
PUMP #1 Stop	8:59:00	0:01:00	22.040	
Wet Well Fill Start	8:59:00			
Wet Well Fill Stop	9:03:00	0:04:00	14.010	61.52
PUMP #1 Start	9:03:00			
PUMP #1 Stop	9:04:00	0:01:00	22.440	**455.70**
Wet Well Fill Start	9:04:00			
Wet Well Fill Stop	9:11:00	0:07:00	22.140	55.56
PUMP #1 Start	9:11:00			
PUMP #1 Stop	9:12:00	0:01:00	21.730	**437.26**
Wet Well Fill Start	9:12:00			
Wet Well Fill Stop	9:18:00	0:06:00	19.090	55.89
PUMP #2 Start	9:18:00			
PUMP #2 Stop	9:19:00	0:01:00	22.540	**451.82**
Wet Well Fill Start	9:19:00			
Wet Well Fill Stop	9:27:00	0:08:00	21.420	47.03
PUMP #2 Start	9:27:00			
PUMP #2 Stop	9:28:00	0:01:00	21.930	**432.25**
Wet Well Fill Start	9:28:00			
Wet Well Fill Stop	9:37:00	0:09:00	30.160	58.86
PUMP #2 Start	9:37:00			
PUMP #2 Stop	9:38:00	0:01:00	22.850	**460.24**
Average		0:03:38		**251.61**
Draw Downs (Multiple Pump Operation)	Time	Run/Fill Time	Level Pumped (inches)	Pump/Fill Rate (gpm)
Wet Well Fill Start	9:38:00			
Wet Well Fill Stop	9:43:00	0:05:00	15.200	53.40
PUMP #1 & #2 Start	9:43:00			
PUMP #1 & #2 Stop	9:44:00	0:01:00	30.730	**593.19**
Wet Well Fill Start	9:44:00			
Wet Well Fill Stop	9:52:00	0:08:00	26.190	57.51
PUMP #1 & #2 Start	9:52:00			
PUMP #1 & #2 Stop	9:53:00	0:01:00	29.040	**567.61**
Wet Well Fill Start	9:53:00			
Wet Well Fill Stop	10:02:00	0:09:00	27.210	53.11
PUMP #1 & #2 Start	10:02:00			
PUMP #1 & #2 Stop	10:03:00	0:01:00	29.340	**568.48**
Average		0:04:00		**367.98**

Table 3.2.7 FM-Kensington Trails: Lift Station Kensington Trails Calculations	
Wet Well 1 L (ft)	NA
Wet Well 1 W or D (ft)	5.983
Wet Well 1 Area (ft^2)	28.11
Pump #1 Test Avg. Pump Rate (gpm)	152.81
Pump #2 Test Avg. Pump Rate (gpm)	241.14
Pump #1 & #2 Test Avg. Pump Rate (gpm)	575.08

Table 3.2.8 FM-Kensington Trails: Lift Station Kensington Trails Draw Down Test Information				
Draw Downs (Single Pump Operation)	Time	Run/Fill Time	Level Pumped (inches)	Pump/Fill Rate (gpm)
PUMP #1 Start	11:12:00			
PUMP #1 Stop	11:13:00	0:01:00	7.810	
Wet Well Fill Start	11:13:00			
Wet Well Fill Stop	11:39:00	0:26:00	15.230	10.27
PUMP #1 Start	11:39:00			
PUMP #1 Stop	11:39:30	0:00:30	3.770	**142.40**
Wet Well Fill Start	11:39:30			
Wet Well Fill Stop	11:41:00	0:01:30	2.240	26.17
PUMP #1 Start	11:41:00			
PUMP #1 Stop	11:42:00	0:01:00	7.820	**163.21**
Wet Well Fill Start	11:42:00			
Wet Well Fill Stop	11:43:00	0:01:00	1.320	23.13
PUMP #2 Start	11:43:00			
PUMP #2 Stop	11:44:00	0:01:00	12.990	**250.78**
Wet Well Fill Start	11:44:00			
Wet Well Fill Stop	11:46:00	0:02:00	1.930	16.91
PUMP #2 Start	11:46:00			
PUMP #2 Stop	11:46:30	0:00:30	6.100	**230.71**
Wet Well Fill Start	11:46:30			
Wet Well Fill Stop	11:49:00	0:02:30	2.540	17.80
PUMP #2 Start	11:49:00			
PUMP #2 Stop	11:50:00	0:01:00	12.790	**241.94**
Average		0:03:27		**112.33**
Draw Downs (Multiple Pump Operation)	Time	Run/Fill Time	Level Pumped (inches)	Pump/Fill Rate (gpm)
Wet Well Fill Start	9:38:00			
Wet Well Fill Stop	9:43:00	0:05:00	15.200	53.27
PUMP #1 & #2 Start	9:43:00			
PUMP #1 & #2 Stop	9:44:00	0:01:00	30.730	**591.81**
Wet Well Fill Start	9:44:00			
Wet Well Fill Stop	9:52:00	0:08:00	26.190	57.37
PUMP #1 & #2 Start	9:52:00			
PUMP #1 & #2 Stop	9:53:00	0:01:00	29.040	**566.29**
Wet Well Fill Start	9:53:00			
Wet Well Fill Stop	10:02:00	0:09:00	27.210	52.98
PUMP #1 & #2 Start	10:02:00			
PUMP #1 & #2 Stop	10:03:00	0:01:00	29.340	**567.15**
Average		0:04:00		**367.12**

Table 3.2.9 FM-Barton Jr High: Lift Station Barton Jr High Calculations	
Wet Well 1 L (ft)	NA
Wet Well 1 W or D (ft)	5.975
Wet Well 1 Area (ft^2)	28.04
Pump #1 Test Avg. Pump Rate (gpm)	879.87
Pump #2 Test Avg. Pump Rate (gpm)	877.55
Pump #1 & #2 Test Avg. Pump Rate (gpm)	1411.32

Table 3.2.10 FM-Barton Jr High: Lift Station Barton Jr High Draw Down Test Information				
Draw Downs (Single Pump Operation)	Time	Run/Fill Time	Level Pumped (inches)	Pump/Fill Rate (gpm)
PUMP #1 Start	8:54:00			
PUMP #1 Stop	8:54:30	0:00:30	25.690	
Wet Well Fill Start	8:54:30			
Wet Well Fill Stop	9:28:00	0:33:30	36.550	19.07
PUMP #1 Start	9:28:00			
PUMP #1 Stop	9:28:30	0:00:30	25.280	**902.75**
Wet Well Fill Start	9:28:30			
Wet Well Fill Stop	9:46:00	0:17:30	19.490	19.47
PUMP #1 Start	9:46:00			
PUMP #1 Stop	9:46:30	0:00:30	23.960	**857.00**
Wet Well Fill Start	9:46:30			
Wet Well Fill Stop	10:04:00	0:17:30	27.110	27.08
PUMP #2 Start	10:04:00			
PUMP #2 Stop	10:04:30	0:00:30	24.270	**875.45**
Wet Well Fill Start	10:04:30			
Wet Well Fill Stop	10:22:00	0:17:30	23.660	23.63
PUMP #2 Start	10:22:00			
PUMP #2 Stop	10:22:30	0:00:30	24.570	**882.49**
Wet Well Fill Start	10:22:30			
Wet Well Fill Stop	10:46:00	0:23:30	21.320	15.86
PUMP #2 Start	10:46:00			
PUMP #2 Stop	10:46:30	0:00:30	24.570	**874.71**
Average		0:10:14		**449.75**
Draw Downs (Multiple Pump Operation)	Time	Run/Fill Time	Level Pumped (inches)	Pump/Fill Rate (gpm)
Wet Well Fill Start	10:46:30			
Wet Well Fill Stop	11:06:00	0:19:30	29.450	26.40
PUMP #1 & #2 Start	11:06:00			
PUMP #1 & #2 Stop	11:06:30	0:00:30	39.300	**1,400.15**
Wet Well Fill Start	11:06:30			
Wet Well Fill Stop	11:33:00	0:26:30	37.980	25.05
PUMP #1 & #2 Start	11:33:00			
PUMP #1 & #2 Stop	11:33:30	0:00:30	39.810	**1,416.63**
Wet Well Fill Start	11:33:30			
Wet Well Fill Stop	11:55:00	0:21:30	40.520	32.94
PUMP #1 & #2 Start	11:55:00			
PUMP #1 & #2 Stop	11:55:30	0:00:30	39.600	**1,417.18**
Average		0:09:54		**858.39**

Table 3.2.11 FM-Indian Paint Brush: Lift Station Indian Paint Brush Calculations	
Wet Well 1 L (ft)	9.967
Wet Well 1 W or D (ft)	9.893
Wet Well 1 Area (ft^2)	98.60
Pump #1 Test Avg. Pump Rate (gpm)	843.40
Pump #2 Test Avg. Pump Rate (gpm)	930.38
Pump #1 & #2 Test Avg. Pump Rate (gpm)	1119.19

Table 3.2.12 FM-Indian Paint Brush: Lift Station Indian Paint Brush Draw Down Test Information				
Draw Downs (Single Pump Operation)	Time	Run/Fill Time	Level Pumped (inches)	Pump/Fill Rate (gpm)
PUMP #1 Start	14:51:00			
PUMP #1 Stop	14:52:00	0:01:00	10.250	
Wet Well Fill Start	14:52:00			
Wet Well Fill Stop	14:55:00	0:03:00	6.800	139.32
PUMP #1 Start	14:55:00			
PUMP #1 Stop	14:56:00	0:01:00	10.760	**800.66**
Wet Well Fill Start	14:56:00			
Wet Well Fill Stop	15:00:00	0:04:00	10.150	155.96
PUMP #1 Start	15:00:00			
PUMP #1 Stop	15:01:00	0:01:00	11.880	**886.14**
Wet Well Fill Start	15:01:00			
Wet Well Fill Stop	15:05:00	0:04:00	11.270	173.17
PUMP #2 Start	15:05:00			
PUMP #2 Stop	15:06:00	0:01:00	12.490	**940.84**
Wet Well Fill Start	15:06:00			
Wet Well Fill Stop	15:10:00	0:04:00	11.330	174.09
PUMP #2 Start	15:10:00			
PUMP #2 Stop	15:11:00	0:01:00	12.750	**957.75**
Wet Well Fill Start	15:11:00			
Wet Well Fill Stop	15:17:00	0:06:00	16.450	168.51
PUMP #2 Start	15:17:00			
PUMP #2 Stop	15:18:00	0:01:00	11.780	**892.54**
Average		0:02:27		**528.90**
Draw Downs (Multiple Pump Operation)	Time	Run/Fill Time	Level Pumped (inches)	Pump/Fill Rate (gpm)
Wet Well Fill Start	15:18:00			
Wet Well Fill Stop	15:24:00	0:06:00	14.420	147.72
PUMP #1 & #2 Start	15:24:00			
PUMP #1 & #2 Stop	15:25:00	0:01:00	14.930	**1,065.36**
Wet Well Fill Start	15:25:00			
Wet Well Fill Stop	15:31:00	0:06:00	13.300	136.24
PUMP #1 & #2 Start	15:31:00			
PUMP #1 & #2 Stop	15:32:00	0:01:00	16.040	**1,122.11**
Wet Well Fill Start	15:32:00			
Wet Well Fill Stop	15:36:00	0:04:00	9.950	152.89
PUMP #1 & #2 Start	15:36:00			
PUMP #1 & #2 Stop	15:37:00	0:01:00	16.550	**1,170.10**
Average		0:02:36		**729.34**

Table 3.2.13 FM-Hemphill: Lift Station Hemphill Calculations	
Wet Well 1 L (ft)	NA
Wet Well 1 W or D (ft)	5.992
Wet Well 1 Area (ft^2)	28.20
Pump #1 Test Avg. Pump Rate (gpm)	63.41
Pump #2 Test Avg. Pump Rate (gpm)	67.82
Pump #1 & #2 Test Avg. Pump Rate (gpm)	71.29

Table 3.2.14 FM-Hemphill: Lift Station Hemphill Draw Down Test Information				
Draw Downs (Single Pump Operation)	Time	Run/Fill Time	Level Pumped (inches)	Pump/Fill Rate (gpm)
PUMP #1 Start	14:13:00			
PUMP #1 Stop	14:14:00	0:01:00	2.640	
Wet Well Fill Start	14:14:00			
Wet Well Fill Stop	14:15:00	0:01:00	0.200	3.52
PUMP #1 Start	14:15:00			
PUMP #1 Stop	14:16:00	0:01:00	3.150	**58.88**
Wet Well Fill Start	14:16:00			
Wet Well Fill Stop	14:18:00	0:02:00	1.630	14.33
PUMP #1 Start	14:18:00			
PUMP #1 Stop	14:19:00	0:01:00	3.050	**67.94**
Wet Well Fill Start	14:19:00			
Wet Well Fill Stop	14:21:00	0:02:00	2.030	17.84
PUMP #2 Start	14:21:00			
PUMP #2 Stop	14:22:00	0:01:00	3.150	**73.21**
Wet Well Fill Start	14:22:00			
Wet Well Fill Stop	14:24:00	0:02:00	1.420	12.48
PUMP #2 Start	14:24:00			
PUMP #2 Stop	14:25:00	0:01:00	3.140	**67.67**
Wet Well Fill Start	14:25:00			
Wet Well Fill Stop	14:26:00	0:01:00	0.710	12.48
PUMP #2 Start	14:26:00			
PUMP #2 Stop	14:27:00	0:01:00	2.850	**62.58**
Average		0:01:16		**39.09**
Draw Downs (Multiple Pump Operation)	Time	Run/Fill Time	Level Pumped (inches)	Pump/Fill Rate (gpm)
Wet Well Fill Start	14:27:00			
Wet Well Fill Stop	14:29:00	0:02:00	1.020	8.96
PUMP #1 & #2 Start	14:29:00			
PUMP #1 & #2 Stop	14:30:00	0:01:00	3.550	**71.36**
Wet Well Fill Start	14:30:00			
Wet Well Fill Stop	14:39:00	0:09:00	4.560	8.91
PUMP #1 & #2 Start	14:39:00			
PUMP #1 & #2 Stop	14:40:00	0:01:00	3.850	**76.58**
Wet Well Fill Start	14:40:00			
Wet Well Fill Stop	14:41:00	0:01:00	0.300	5.27
PUMP #1 & #2 Start	14:41:00			
PUMP #1 & #2 Stop	14:42:00	0:01:00	3.450	**65.92**
Average		0:02:36		**45.61**

Table 3.2.15 FM-Southlake: Lift Station Southlake Calculations	
Wet Well 1 L (ft)	NA
Wet Well 1 W or D (ft)	9.95
Wet Well 1 Area (ft^2)	77.68
Pump #1 Test Avg. Pump Rate (gpm)	836.77
Pump #2 Test Avg. Pump Rate (gpm)	845.22
Pump #3 Test Avg. Pump Rate (gpm)	236.45
Pump #1 & #2 Test Avg. Pump Rate (gpm)	1523.22
Pump #2 & #3 Test Avg. Pump Rate (gpm)	842.09
Pump #1 & #3 Test Avg. Pump Rate (gpm)	893.26
All Pumps Test Avg. Pump Rate (gpm)	1692.86

Table 3.2.16 FM-Southlake: Lift Station Southlake Draw Down Test Information				
Draw Downs (Single Pump Operation)	Time	Run/Fill Time	Level Pumped (inches)	Pump/Fill Rate (gpm)
PUMP #1 Start	15:50:00			
PUMP #1 Stop	15:51:00	0:01:00	10.960	
Wet Well Fill Start	15:51:00			
Wet Well Fill Stop	15:53:00	0:02:00	13.700	331.67
PUMP #1 Start	15:53:00			
PUMP #1 Stop	15:54:00	0:01:00	11.060	**867.19**
Wet Well Fill Start	15:54:00			
Wet Well Fill Stop	15:56:00	0:02:00	12.890	312.06
PUMP #1 Start	15:56:00			
PUMP #1 Stop	15:57:00	0:01:00	11.670	**877.12**
Wet Well Fill Start	16:47:00			
Wet Well Fill Stop	16:48:00	0:01:00	7.390	357.82
PUMP #1 Start	16:48:00			
PUMP #1 Stop	16:49:00	0:01:00	8.430	**766.00**
Wet Well Fill Start	15:57:00			
Wet Well Fill Stop	15:58:00	0:01:00	5.990	290.03
PUMP #2 Start	15:58:00			
PUMP #2 Stop	15:59:00	0:01:00	11.070	**826.04**
Wet Well Fill Start	15:59:00			
Wet Well Fill Stop	16:01:00	0:02:00	12.490	302.38
PUMP #2 Start	16:01:00			
PUMP #2 Stop	16:02:00	0:01:00	10.870	**828.70**
Wet Well Fill Start	16:02:00			
Wet Well Fill Stop	16:04:00	0:02:00	12.800	309.88
PUMP #2 Start	16:04:00			
PUMP #2 Stop	16:05:00	0:01:00	10.780	**831.85**
Wet Well Fill Start	16:49:00			
Wet Well Fill Stop	16:50:00	0:01:00	7.610	368.47
PUMP #2 Start	16:50:00			
PUMP #2 Stop	16:51:00	0:01:00	10.860	**894.31**
Wet Well Fill Start	16:05:00			
Wet Well Fill Stop	16:07:00	0:02:00	12.500	302.62
PUMP #3 Start	16:07:00			
PUMP #3 Stop	16:08:00	0:01:00	-5.380	**571.35**
Wet Well Fill Start	16:08:00			
Wet Well Fill Stop	16:09:00	0:01:00	3.960	191.74
PUMP #3 Start	16:09:00			
PUMP #3 Stop	16:10:00	0:01:00	-2.640	**63.91**
Wet Well Fill Start	16:10:00			
Wet Well Fill Stop	16:11:00	0:01:00	3.560	172.37
PUMP #3 Start	16:11:00			
PUMP #3 Stop	16:12:00	0:01:00	-2.030	**74.08**
Average		0:01:14		**476.98**

Table 3.2.16 FM-Southlake: Lift Station Southlake Draw Down Test Information				
Draw Downs (Multiple Pump Operation)	Time	Run/Fill Time	Level Pumped (inches)	Pump/Fill Rate (gpm)
Wet Well Fill Start	16:12:00			
Wet Well Fill Stop	16:13:00	0:01:00	1.120	54.23
PUMP #1 & #2 Start	16:13:00			
PUMP #1 & #2 Stop	16:14:00	0:01:00	20.010	**1,023.10**
Wet Well Fill Start	16:14:00			
Wet Well Fill Stop	16:15:00	0:01:00	9.340	452.24
PUMP #1 & #2 Start	16:15:00			
PUMP #1 & #2 Stop	16:16:00	0:01:00	27.520	**1,784.74**
Wet Well Fill Start	16:16:00			
Wet Well Fill Stop	16:18:00	0:02:00	13.210	319.81
PUMP #1 & #2 Start	16:18:00			
PUMP #1 & #2 Stop	16:19:00	0:01:00	27.420	**1,647.47**
Wet Well Fill Start	16:51:00			
Wet Well Fill Stop	16:52:00	0:01:00	6.910	334.58
PUMP #1 & #2 Start	16:52:00			
PUMP #1 & #2 Stop	16:53:00	0:01:00	26.910	**1,637.55**
Wet Well Fill Start	16:19:00			
Wet Well Fill Stop	16:24:00	0:05:00	32.600	315.69
PUMP #2 & #3 Start	16:24:00			
PUMP #2 & #3 Stop	16:25:00	0:01:00	11.380	**866.71**
Wet Well Fill Start	16:25:00			
Wet Well Fill Stop	16:26:00	0:01:00	5.490	265.82
PUMP #2 & #3 Start	16:26:00			
PUMP #2 & #3 Stop	16:27:00	0:01:00	11.140	**805.22**
Wet Well Fill Start	16:27:00			
Wet Well Fill Stop	16:29:00	0:02:00	13.270	321.26
PUMP #2 & #3 Start	16:29:00			
PUMP #2 & #3 Stop	16:30:00	0:01:00	11.010	**854.36**
Wet Well Fill Start	16:30:00			
Wet Well Fill Stop	16:32:00	0:02:00	13.750	332.88
PUMP #1 & #3 Start	16:32:00			
PUMP #1 & #3 Stop	16:33:00	0:01:00	12.790	**952.17**
Wet Well Fill Start	16:33:00			
Wet Well Fill Stop	16:34:00	0:01:00	6.190	299.72
PUMP #1 & #3 Start	16:34:00			
PUMP #1 & #3 Stop	16:35:00	0:01:00	12.410	**900.60**
Wet Well Fill Start	16:35:00			
Wet Well Fill Stop	16:36:00	0:01:00	6.420	310.85
PUMP #1 & #3 Start	16:36:00			
PUMP #1 & #3 Stop	16:37:00	0:01:00	10.660	**827.00**
Wet Well Fill Start	16:37:00			
Wet Well Fill Stop	16:38:00	0:01:00	6.700	324.41
ALL PUMPS Start	16:38:00			
ALL PUMPS Stop	16:39:00	0:01:00	27.060	**1,634.64**
Wet Well Fill Start	16:39:00			
Wet Well Fill Stop	16:43:00	0:04:00	29.990	363.02
ALL PUMPS Start	16:43:00			
ALL PUMPS Stop	16:44:00	0:01:00	28.820	**1,758.47**
Wet Well Fill Start	16:44:00			
Wet Well Fill Stop	16:46:00	0:02:00	14.420	349.10
ALL PUMPS Start	16:46:00			
ALL PUMPS Stop	16:47:00	0:01:00	27.600	**1,685.48**
Average		0:01:26		**814.68**

Table 3.2.17 City of Kyle Lift Station Inspection Matrix

Kyle Lift Station Inspections	Bunton Creek Estates	Bradford Meadows	Masonwood	Southlake	Kensington Trails	Barton Jr. High	Indian Paintbrush	Hemphill
	101 Bunton Ln	116 J Maryes Ln	642 Masonwood Dr	350 Spillway Dr	110 Anton Dr	4950 Jack C Hays Trail	285 Peppergrass Cove	3995 FM 150 E
Shelter								
Type	Metal Awning	N/A	Metal Awning	N/A	N/A	N/A	Metal Awning	N/A
Condition	Fair	N/A	Fair	N/A	N/A	N/A	Fair	N/A
Pump Station								
Type	Submersible	Submersible	Submersible	Submersible	Submersible	Submersible	Submersible	Submersible
Station Cycling	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Valve Vault/Dry Pit								
Present?	Yes	Yes	Yes Yes	Yes	Yes	Yes Yes	Yes	Yes
Condition	Fair	Fair	Fair Fair	Fair	Fair	Fair Fair	Fair	Fair
Depth (ft)	4' 6"	3' 10"	6' 8" 5' 5"	6' 2"	5' 11"	3' 5" 3'	8' 5"	8' 3"
Ladder Present?	No	No	No No	No	No	No No	No	No
Valves Exposed?	Yes	Yes	Yes Yes	Yes	Yes	Yes Yes	Yes	Yes
General Valve Condition	Fair	Fair	Fair Fair	Fair	Fair	Fair Fair	Fair	Fair
Comments			Valve MH, with one Check Valve after Valve Vault			3' MH has one (1) air release valve		
Control Panel								
Weathertight?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Material	Stainless	Painted Steel	Painted Steel	Painted Steel	Fiberglass	Painted Steel	Painted Steel	Painted Steel
Corrosion Present?	No	Yes	No	Yes	No	Yes	Yes	Yes
Ground Clearance (in)	23	24.5	29	15	36	39.5	35.5	44.5
Main Breaker Service (Amps)	15	20	15	100	20	14	100	40
Motor Starter (Amps)	6.8	6.5	6.5	57	12.8	13	67	13
Single Phase/3 Phase?	3 Phase	3 Phase	3 Phase	3 Phase	3 Phase	3 Phase	3 Phase	3 Phase
Voltage	460	460	460	460	460	460	460	460
Run Current Available?	No	No	No	No	No	No	No	No
Personnel Entry								
Type	Hatches/ Manhole Lid	Hatches/ Manhole Lid	Hatches/ Manhole Lid	Hatches/ Manhole Lid	Hatches/ Manhole Lid	Hatches/ Manhole Lid	Hatches/ Manhole Lid	Hatches/ Manhole Lid
Condition of Hatches/Covers	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair
Condition of Manhole Covers	Good	Good	Good	Good	Good	Good	Good	Good
Wet Well								
Material	RCP	RCP	RCP	RCP	RCP	RCP	Precast	RCP
Configuration	Round	Round	Round	Round	Round	Round	Square	Round
Anti-Corrosion coating	Coated	Coated	Coated	Coated	Coated	Uncoated	Coated	Uncoated
Condition	Fair	Fair	Fair	Fair	Fair	Fair	Fair	Fair
Size (x) (feet)	N/A	N/A	N/A	N/A	N/A	N/A	118.72"	N/A
Size (y) (feet)	N/A	N/A	N/A	N/A	N/A	N/A	119.60"	N/A
Size (Diameter) (feet)	5.998'	71.74"	71.88"	119.34"	71.8"	71.70"	N/A	71.90"
Depth (feet)	14' 1"	19' 11"	21' 11"	24' 10"	22"	12' 4"	20' 2"	11' 6"
Inlet Elevation and Size #1	8' 4"	9' 11" , 8" Line	14' 4" , 8" Line	10' 8" , 10" Line	14' 3" , 8" Line	6' 10"	13' 5" , 12"Line	10' 7" , 8" Line
Inlet Elevation and Size #2	10' 7"	13' 4" , 8" Line	N/A	13' 3" , 27" Line	N/A	N/A	N/A	8' 10" , 8" Line
Inlet Elevation and Size #3	8' 5"	N/A	N/A	N/A	N/A	N/A	N/A	11' 5" , 8" Line
Grease Acucumulation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Water Surface Elevation								
High Water Alarm	107.5"	118" Float	129"	153"	185"	122"	156"	95"
Lead/Lag On	Not Known	192" Plans	175"	177"	195"	91"	174"	111"

Table 3.2.17 City of Kyle Lift Station Inspection Matrix

Kyle Lift Station Inspections	Bunton Creek Estates	Bradford Meadows	Masonwood	Southlake	Kensington Trails	Barton Jr. High	Indian Paintbrush	Hemphill
	101 Bunton Ln	116 J Maryes Ln	642 Masonwood Dr	350 Spillway Dr	110 Anton Dr	4950 Jack C Hays Trail	285 Peppergrass Cove	3995 FM 150 E
Lead On	Not Known	216" Plans	182"	191"	214"	81"	186"	116"
Pump Off	152"	212" Float	207"	214"	219.5'	75"	198"	122"
Low Water Alarm	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gravity Line In	8' 4" / 10' 7" / 8' 5"	9' 11" / 13' 4"	14' 4"	10' 8" / 13' 3"	14' 3"	6' 10"	13' 5"	8' 10" / 10' 7" / 11' 5"
Force Main Elevation	39" From top of pipe	29.5" From top of pipe	40" From top of pipe	41" From top of pipe	43" From top of pipe	25" From top of pipe	84" From top of pipe	58" From top of pipe
Note: All Distances are Measured from the Top of Slab								
Level Control								
Type	Float (Flyght Multitrode)	Float (Flyght Multitrode)	Float	Float	Float	Float	Float	Float
Operating Levels								
Type	Above Influent Line	Ok	Ok	Ok	Ok	Ok	Ok	Above Influent Line
Force Main Piping								
Material	Ductile Iron	Ductile Iron	Ductile Iron	Ductile Iron	Ductile Iron	Ductile Iron	Ductile Iron	Ductile Iron
Fittings	Flanged	Flanged	Flanged	Flanged	Flanged	Flanged	Flanged	Threaded
Condition	Fair	Lt Corrosion	Fair	Lt Corrosion	Fair	Lt Corrosion	Fair	Fair
Unions	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Comments								
Size (inches)	4"	4"	6"	8"	6"	6"	8"	2"
Comments								
Valve Vault - Dry Well								
Present?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Type of Hatch/Cover	Hatch	Hatch	Hatch	Hatch	Hatch	Hatch	Hatch	Hatch
Depth	4' 6"	3' 10"	6' 8"	6' 2"	5' 11"	3' 5"	8' 5"	8' 3"
Access	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Valves (number)	3	3	2	3-8" / 4-10"	2 Main / 1 Bypass	2	2 Main / 1 Bypass	2
Diameter (inches)	4	4	6	3-8" / 4-10"	6" Main / 3" Bypass	6	8" Main / 4" Bypass	4
Check Valves	2	2	2	3	2 Main	2	2 Main / 1 Bypass	2
Diameter (inches)	4	4	6	8	6" Main	6	8" Main / 4" Bypass	4
Piping Material	Ductile Iron	Ductile Iron	Ductile Iron	Ductile Iron	Ductile Iron	Ductile Iron	Ductile Iron	Ductile Iron
Piping Diameter (inches)	4	4	6	8" / 10"	6" Main / 3" Bypass	6	8" Main / 4" Bypass	4
Comments	External fitting for emergency pump hookup	External fitting for emergency pump hookup	MH has 1-6" check valve	2 - 10" Outgoing force mains	3" Fitting for emergency pump hookup		External fitting for emergency pump hookup	
Upstream Manhole (if available)								
Distance (ft)	61' 20'	119' 45'	12'	60' 33'	7' 3"	81'	8' 9"	6' 33' 43'
Level from Ring	7' 4" 10' 11"	5' 8" 7' 11"	12' 1"	8' 5" 10' 7"	14' 5"	2' 11"	14' 5"	11' 6" 9' 8" 8' 9"
Force Main								
In elevation	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Out elevation	39" From top of pipe	29.5" From top of pipe	40" From top of pipe	41" From top of pipe	43" From top of pipe	25" From top of pipe	84" From top of pipe	58" From top of pipe
Empty Pump Slot for Expansion	No	No	No	No	No	No	No	No

Table 3.2.17 City of Kyle Lift Station Inspection Matrix

Kyle Lift Station Inspections	**Bunton Creek Estates**	**Bradford Meadows**	**Masonwood**	**Southlake**	**Kensington Trails**	**Barton Jr. High**	**Indian Paintbrush**	**Hemphill**
	101 Bunton Ln	**116 J Maryes Ln**	**642 Masonwood Dr**	**350 Spillway Dr**	**110 Anton Dr**	**4950 Jack C Hays Trail**	**285 Peppergrass Cove**	**3995 FM 150 E**
Name Plate Data from Pumps	FLYGHT 3102 180-0430631 3102 180-0090 434	3102.180-0050669 3~60HZ 3.7KW SHP 1715RPM	FLYGHT 3201 180 6112 9760 595 434 MM	3201 180 0210103 FLYGHT - 60HZ - 47HP - 1755 RPM	HYDROMATIC AURORA - 4/DROMATIC PUMPS INC	FLYGHT 3127181-0100 60HZ 1735 RPM 13-25AMP	MEYERS - CODE 202 - CAT NO 4V 500 M4-43	FLYGHT 3127 170-0010021 3127.170-6015 262
	32 60HZ 3.7KW 5HP 1745RPM S1 MAX 40DEG	S1 MAX 40DEGREES YSER 460/Y//230V 6.5/13A	FLS M18-11-4AL - YSER / Y11 3.7KW 5HP COSP 0.88	YSER 460/Y/230V 57/113A	MODEL S 4M 750 M 4 4 10T96 - IMP DIA 7.56 - HP 7.5	10H 1EC60034-1IP68 60DEGREES 7.5KW 10 HP	CODE 02385 - IMP DIA 11.5 - HP 50 - RPM 1750 - PHASE 3	3~60HZ 7.5HP SF1.5 3495RPM S1 MAX 40DEGREES
	YSER 460/Y//230V 6.8/14A COS 0.81	TP III CIF IEC60034-1 IP68	460/230V 6.5/13A 3N60 HZ S1% - 1715 R/MM	MADE IN SWEEDEN ITTFLYGHTAB	VOLTS 460 - PH-H2360 - FLA 11 - SFA 12.8	460 11B11 230V 3127.181-0651005	VOLTS 460 - AMPS 67 - HZ 60	YSER 46014//230V SFA 13/26A COS 0.93
Influent Gravity Line								
Above OFF setting	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Above Lead ON setting	No	Yes	Yes	Yes	Yes	Yes	Yes	No
Power Supply								
Empergency power supply available	None Present	None Present	None Present	Yes	None Present	None Present	None Present	None Present
Gas Levels								
Wet Well Levels								
O_2	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9
CO	0	0	0	0	0	0	0	0
H_2S	0	0	0	1	0	0	0	0
LEL	0	0	0	0	0	0	0	0
Dry Well Levels								
O_2	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9
CO	0	0	0	0	0	0	0	0
H_2S	0	0	0	0	0	0	0	0
LEL	0	0	0	0	0	0	0	0
Additional Notes								

4.0 Hydraulic Model Calibration

This section of the report explains the process for adjusting model generated dry and wet weather model wastewater flow to closely match the measured flow data. This process is called Calibration of the Model.

4.1 Wastewater Flow Monitoring

B&N performed wastewater flow and rainfall monitoring in the City of Kyle wastewater collection system as a task in the wastewater modeling project. The monitoring locations were determined through map study of the system, hydraulic model needs, and the results of field site investigation conducted by B&N field personnel. Ten (10) flow monitors were installed in the system from February 11 to March 24, 2015. Five (5) rainfall gages were installed to capture rainfall experienced by the area during the monitoring period.

All temporary gravity monitoring equipment was calibrated prior to installation and calibrated at regular intervals during the monitoring period. The calibration process consists of the comparison of physical wastewater flow measurements to sensed measurements. The physical measurements are obtained with a portable velocity meter to determine velocity and a ruler to obtain level readings. Rainfall data is used in wet weather analysis in determining rain induced infiltration and inflow (RDII). Tipping bucket rain gages (where one “tip” equals 0.01 inch of precipitation) were maintained at a total of five sites for the flow monitoring study.

4.2 Wastewater Flow Data Analysis

Throughout the flow monitoring period, data collected from each flow meter site was processed and analyzed by B&N engineering staff. Field calibrations were performed at regular intervals for each monitored site to confirm sensed measurements (measurements taken by the flow meter sensor) and to develop points along the flow profile (early morning, late morning, afternoon, evening, night). Collected data and field calibration information are used together in flow data analysis.

Continuous evaluation of the reliability and accuracy of the collected data is essential to ensuring quality data analysis. Four tools are used in this process: 1) Time Series Depth and Velocity Graphs; 2) Flow Hydrographs; 3) Scatter Plots of Velocity vs. Level; 4) Field Information (Calibration Data, Pictures, etc.). Using these tools and applying open channel hydraulic engineering principles, flow data quality is determined and system analysis is performed.

The results of the wastewater collection system flow and rainfall monitoring are provided in the following figures, tables and charts:

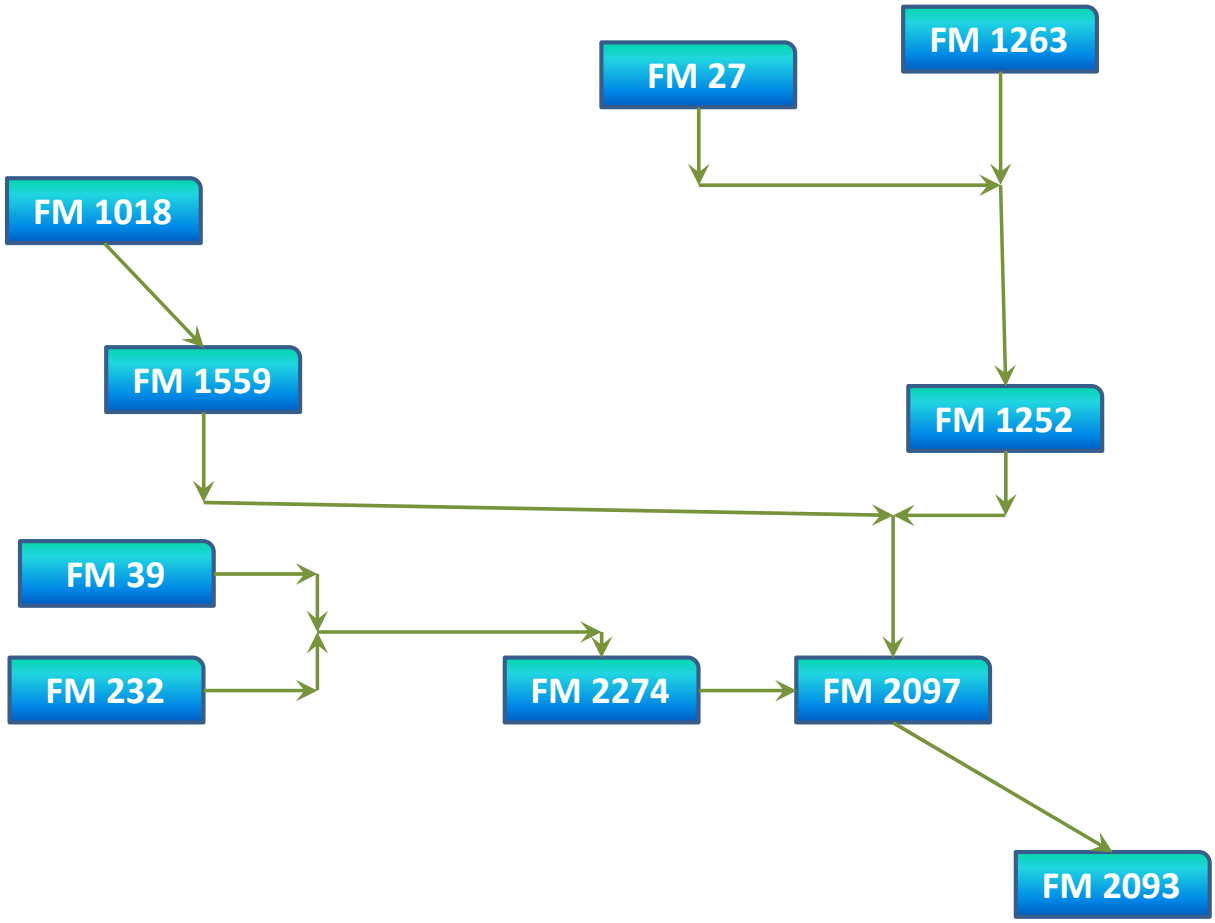


Figure 4.2.1 – Wastewater Collection System Flow Monitoring Schematic

Table 4.2.1 Rainfall Gage Analysis

Rain Gage	Rainfall Event Date[1]					MAX	AVERAGE	Total
	3/8/2015	3/9/2015	3/18/2015	3/20/2015	3/21/2015			
	24 Hour Total (in.)	24 Hour Total (in.)	24 Hour Total (in.)	24 Hour Total (in.)	24 Hour Total (in.)			
RG Barton	0.32	1.00	0.17	0.65	0.28	1.00	0.48	2.42
RG Bradford	0.47	1.19	0.19	0.70	0.31	1.19	0.57	2.86
RG Bunton	0.57	1.22	0.21	0.52	0.43	1.22	0.59	2.95
RG Indian	0.46	1.23	0.17	0.65	0.41	1.23	0.58	2.92
RG Southlake	0.52	1.21	0.20	0.57	0.43	1.21	0.59	2.93
AVERAGE	0.47	1.17	0.19	0.62	0.37			
MAX	0.57	1.23	0.21	0.70	0.43			

[1] Events with an average 24 hour total of 0.30 inches or more were analyzed, with the exception of events that precede or follow a significant rainfall event.

Table 4.2.2 Measured Wastewater Flows - 3/08/15 - 3/09/15 Rainfall Event						
Gaging Station No.	Dry Weather[1] Average Daily Flow (mgd)	Dry Weather[1] Peak Flow Rate (mgd)	Wet Weather[1] Daily Maximum Flow (mgd)	Wet Weather[1] Peak Flow Rate (mgd)	Dry Peak[1] Flow Ratio	Wet Peak[1] Flow Ratio
FM 2093	2.34	3.41	4.13	5.55	1.46	2.37
FM 2097	2.37	3.24	3.69	4.77	1.37	2.02
FM 2274	0.59	0.80	1.42	1.77	1.35	2.99
FM 39	0.32	0.42	0.92	1.13	1.29	3.49
FM 232	0.22	0.26	0.65	0.87	1.17	3.88
FM 1252	0.58	0.84	0.81	1.07	1.45	1.85
FM 1559	0.62	0.93	0.96	1.33	1.50	2.14
FM 1018	0.17	0.24	0.21	0.29	1.47	1.73
FM 27	0.08	0.12	0.08	0.13	1.52	1.70
FM 1263	0.05	0.07	0.05	0.08	1.40	1.61
Average	0.73	1.03	1.29	1.70	1.40	2.38
Maximum	2.37	3.41	4.13	5.55	1.52	3.88

[1]Dry weather analysis period applied is February 21 - 27, 2015.

Table 4.2.3 Inflow and Infiltration - Measured 3/08/15 - 3/09/15 Rainfall Event					
Gaging Station No.	Peak I&I (mgd)	Length of Sewer Main (linear feet)	Sewered Area (acre)	I&I (GPD) per acre	I&I (GPD) per LF of sewer main
FM 2093	3.21	634,631.5	9,002.0	356.6	5.1
FM 2097	2.41	551,911.6	7,991.4	301.0	4.4
FM 2274	1.18	155,741.6	1,793.2	657.3	7.6
FM 39	0.81	54,745.0	543.6	1,481.0	14.7
FM 232	0.65	44,066.1	514.9	1,253.4	14.6
FM 1252	0.49	120,162.0	2,524.8	193.4	4.1
FM 1559	0.71	169,684.5	2,195.5	322.6	4.2
FM 1018	0.12	61,974.3	1,181.4	102.7	2.0
FM 27	0.05	27,174.0	936.5	58.7	2.0
FM 1263	0.03	13,336.4	386.9	75.6	2.2
Average	0.96	183342.7	2707.0	480.2	6.1
Maximum	3.21	634631.5	9002.0	1481.0	14.7

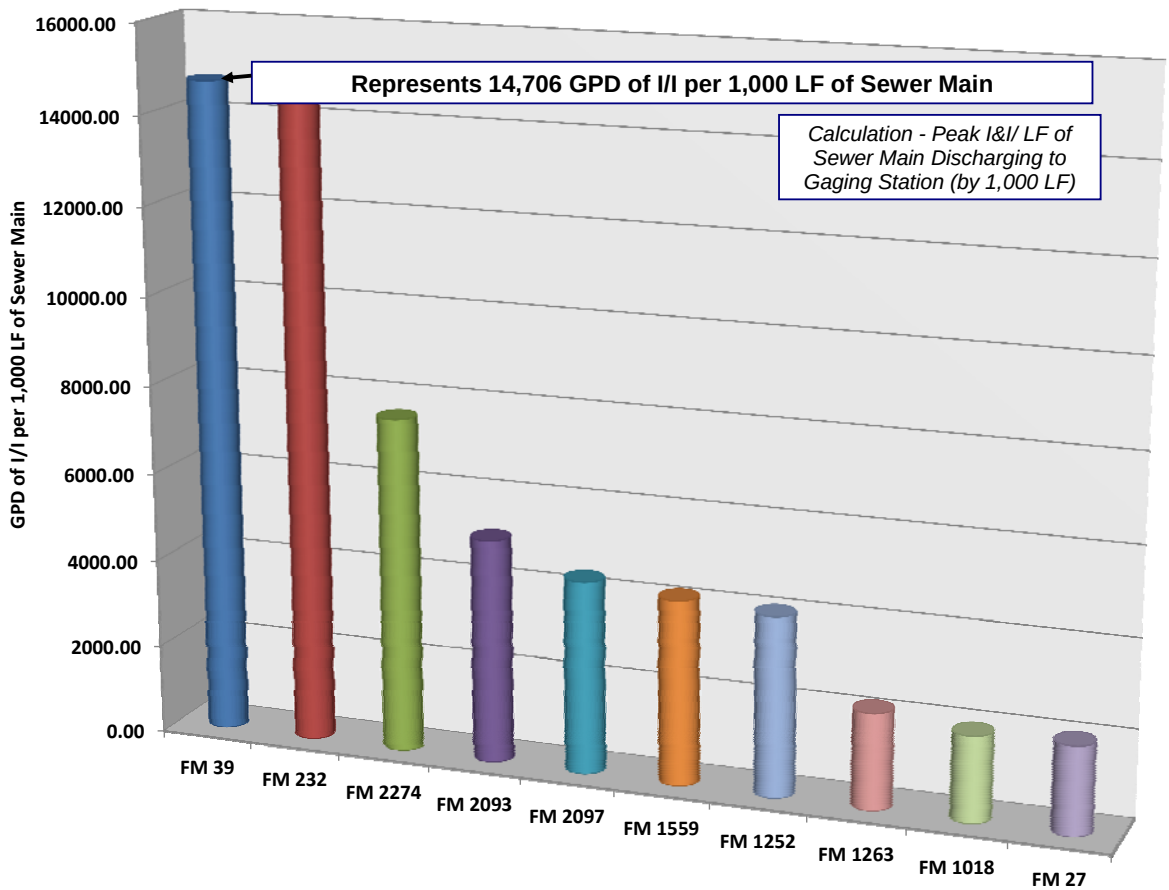


Figure 4.2.2 – GPD of Inflow & Infiltration per 1,000 LF of Pipe – 3/08/15 – 3/09/15 Rain Event

Table 4.2.4 Measured Wastewater Flows - 3/20/15 - 3/21/15 Rainfall Event

Gaging Station No.	Dry Weather[1] Average Daily Flow (mgd)	Dry Weather[1] Peak Flow Rate (mgd)	Wet Weather[1] Daily Maximum Flow (mgd)	Wet Weather[1] Peak Flow Rate (mgd)	Dry Peak[1] Flow Ratio	Wet Peak[1] Flow Ratio
FM 2093	2.33	3.40	4.04	5.48	1.46	2.36
FM 2097	2.38	3.27	3.79	4.55	1.37	1.91
FM 2274	0.59	0.80	1.47	1.62	1.35	2.74
FM 39	0.34	0.42	1.02	1.08	1.24	3.17
FM 232	0.23	0.27	0.64	0.67	1.17	2.97
FM 1252	0.58	0.83	0.80	1.04	1.45	1.80
FM 1559	0.74	1.08	1.20	1.58	1.46	2.14
FM 1018	0.14	0.22	0.19	0.31	1.53	2.16
FM 27	0.07	0.10	0.08	0.13	1.49	1.91
FM 1263	0.04	0.07	0.07	0.09	1.49	1.97
Average	0.74	1.05	1.33	1.66	1.40	2.31
Maximum	2.38	3.40	4.04	5.48	1.53	3.17

[1]Dry weather analysis period applied is February 25 – March 3, 2015.

Table 4.2.5 Inflow and Infiltration - Measured 3/20/15 - 3/21/15 Rainfall Event					
Gaging Station No.	**Peak I&I (mgd)**	**Length of Sewer Main (linear feet)**	**Sewered Area (acre)**	**I&I (GPD) per acre**	**I&I (GPD) per LF of sewer main**
FM 2093	3.16	634,631.5	9,002.0	350.7	5.0
FM 2097	2.17	551,911.6	7,991.4	271.1	3.9
FM 2274	1.03	155,741.6	1,793.2	575.7	6.6
FM 39	0.74	54,745.0	543.6	1,360.7	13.5
FM 232	0.45	44,066.1	514.9	867.5	10.1
FM 1252	0.46	120,162.0	2,524.8	183.1	3.8
FM 1559	0.84	169,684.5	2,195.5	383.2	5.0
FM 1018	0.17	61,974.3	1,181.4	142.3	2.7
FM 27	0.06	27,174.0	936.5	66.8	2.3
FM 1263	0.04	13,336.4	386.9	110.8	3.2
Average	0.91	183342.7	2707.0	431.2	5.6
Maximum	3.16	634631.5	9002.0	1360.7	13.5

[1]Dry weather analysis period applied is February 25 – March 3, 2015.

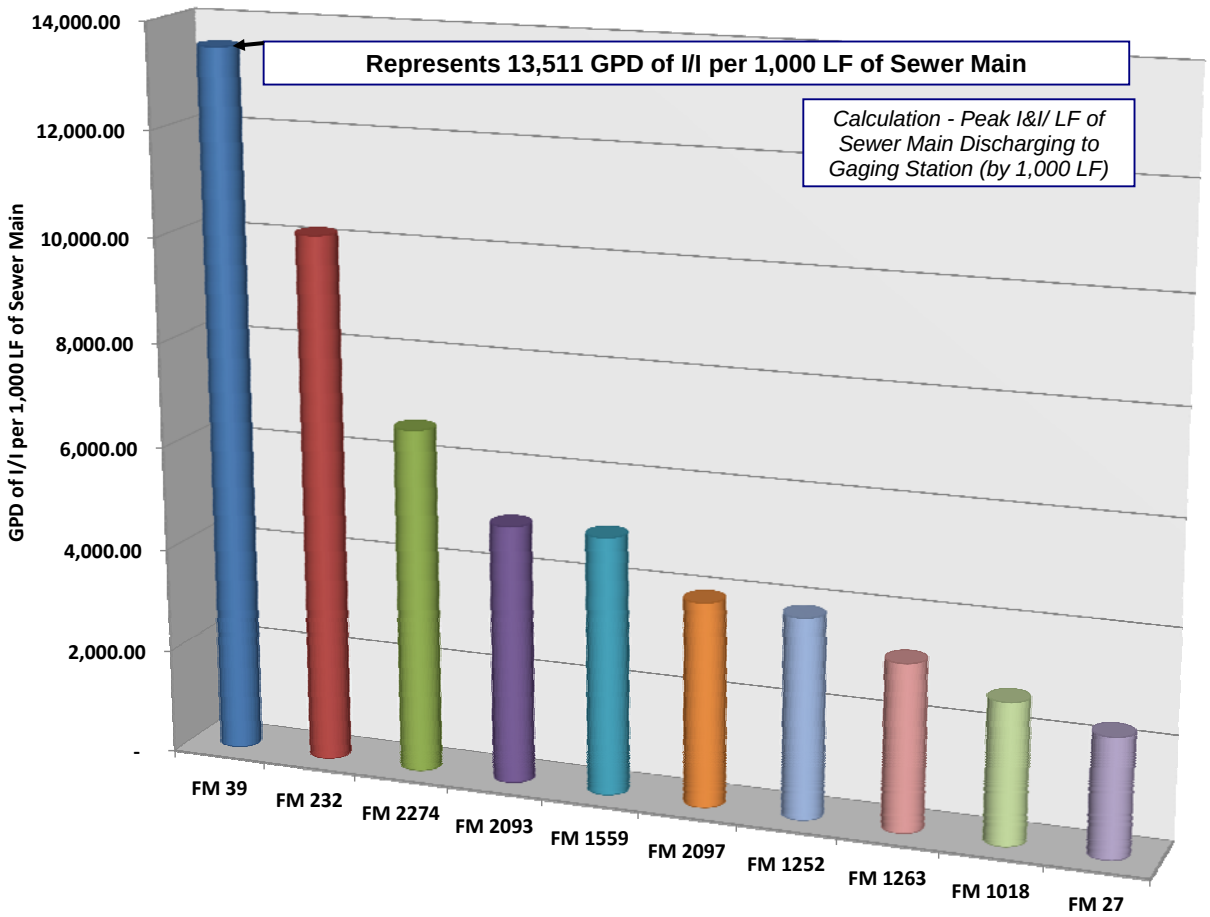


Figure 4.2.3– GPD of Inflow & Infiltration per 1,000 LF of Pipe – 3/20/15 – 3/21/15 Rain Event

4.3 Dry Weather Calibration

A model is considered to be dry weather calibrated when the base diurnal-flows in the model are within ten percent of the actual measured flows during the dry period for both volume and rate. Flow meters measure base flows in the collection system during periods where the system is not affected by rain events. B&N placed ten (10) flow meters in the City of Kyle's wastewater collection system. Each flow meter was strategically placed to optimize measurement accuracy and to divide the collection system into evenly sized basins. Figure 4.2.4 on the following page displays the flow meters that were placed in the wastewater collection system and the associated wastewater basin boundaries. The flow meter basins are an aggregate of the subcatchments discussed in Section 2.0. Measuring wastewater flows at multiple points in the collection system during a dry weather period reveals actual wastewater demands on the system and is used to develop base flows in the system for each basin and subcatchment.

Subcatchments are categorized as, residential, commercial, industrial, school, hospital, etc.; each designation has a different diurnal pattern and a different average daily load per acre. Base wastewater flow within the model is generated using population per acre. The population within each subcatchment is assigned a wastewater profile comprised of an average per capita flow rate and hourly multipliers. During dry-weather model calibration, the representative per capita flow rates and hourly multipliers are adjusted to match the dry-weather flow observed in each of the flow meter basins. Adjustments are made starting from the most upstream basins and working downstream towards the wastewater treatment plant. Adjustments are continued until the flows calculated by the model are consistent with the measured flows for each basin in the actual collection system. The peak flows from this calibrated model match the observed flow peaks to well within 5%.

The model calibration process also includes adjusting the flow parameters to ensure that observed depths and velocities in the collection system are also recreated in the model. The calibrated dry-weather model serves as the starting point for calibrating the model to the observed wet-weather events. Per capita flow rates and diurnal flow patterns determined during the dry-weather model calibration are used for the design rainfall event hydraulic analysis.

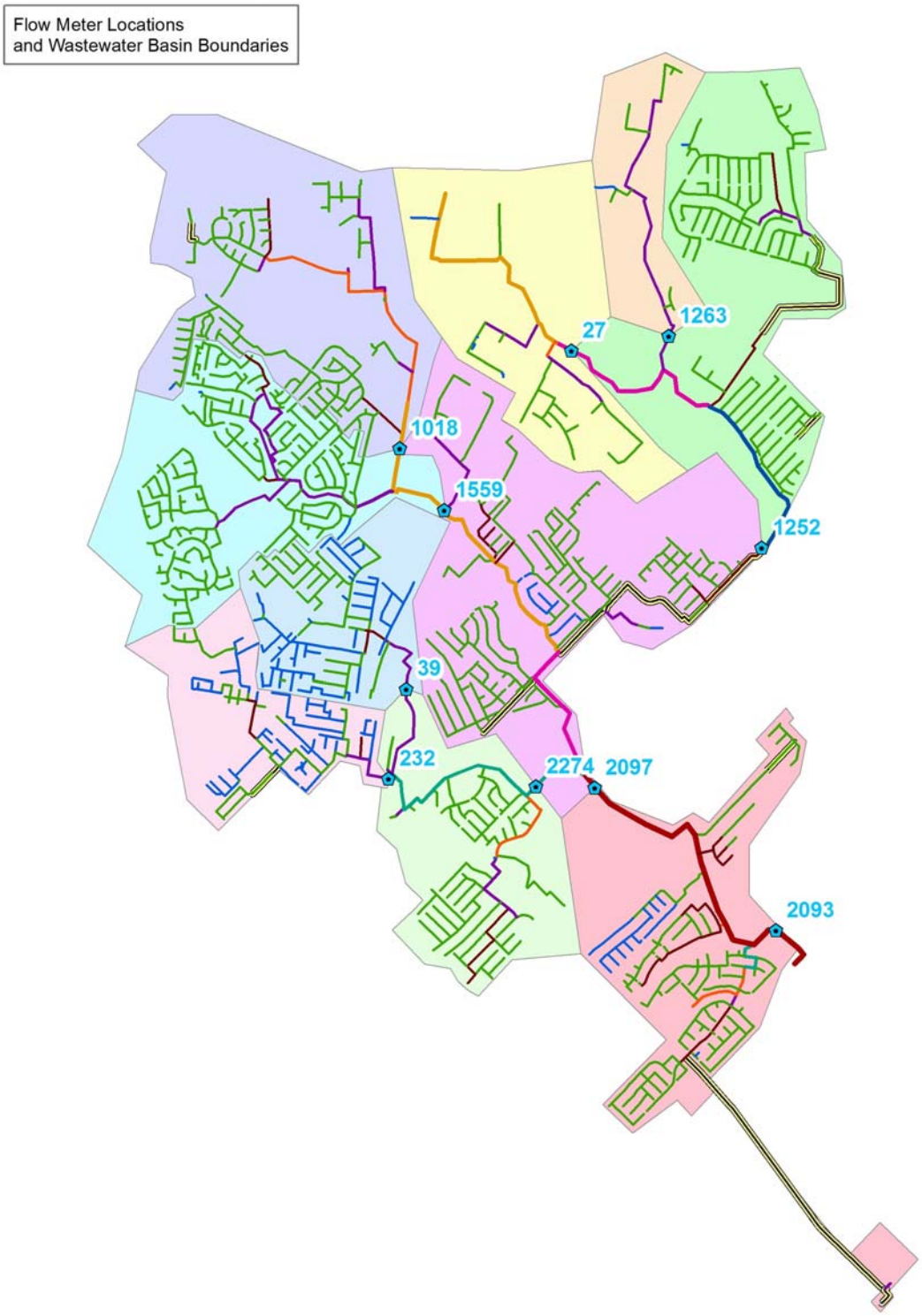


Figure 4.2.4 – Wastewater Flow Meter Basin Boundaries.

4.4 Wet Weather Calibration

Each subsection of the collection system responds differently to rainfall events, which is why wet weather calibration is critical to the usefulness of the hydraulic model. Some factors that affect wet weather calibration are the SCS Curve Number (CN), the Time of Concentration (Tc), and the rain intensity curve. Wet weather calibration adjusts various parameters in the model to correctly simulate flows measured in the actual system during an observed rain event. Ten (10) flow meters measured flows during a storm that occurred March 8-9, 2015. This rain event was isolated and the flow meter data showed flows that are consistent with RDII and was used to calibrate the model for wet weather conditions. Rain gauges were placed throughout the city to measure the rainfall during all storm events.

This rainfall event was isolated (no antecedent soil conditions to consider) and resulted in inflow and infiltration into the collection system (see Section 4.2). The presence of RDII resulted in degraded system performance. This rain event was used to calibrate the model for wet weather. During wet weather calibration, various parameters associated with the subcatchments developed during the model building exercise were adjusted until the rate and volume of RDII into the collection system and the wet weather flow closely represented the system performance recorded by the flow meters.

Inflow and wet weather infiltration is defined as extraneous flow that enters a sewer system both during and after wet weather. Inflow normally occurs during rainfall episodes and immediately thereafter. Wet weather infiltration can be expressed as a delayed reaction to rainfall primarily due to wet weather percolation of rainfall through the soil and into the collection system. Inflow and wet weather infiltration can also be expressed as all wastewater flow above the dry weather average flow. Since inflow and wet weather infiltration can occur simultaneously, accurately quantifying them as separate quantities is difficult in most cases.

Methods used to determine how much and how fast rainfall enters the collection system include the Soil Conservation Service (SCS) unit hydrograph method and the RTK method. Both methods are industry standards for modeling how RDII will enter a wastewater collection system and were used to calibrate this model. Runoff curve numbers (CN), time of concentration (Tc) values, and RTK tables were modified for each subcatchment until the flows represented by the model closely match the flows measured during the rainfall event. Special attention is paid to matching the observed peak flow rate. Wastewater flow rate is the primary element that the model is calibrated for, but depth and velocities are also calibrated to observed values after flows are established. The model is considered to be calibrated for wet weather when the flow, velocity, and depth represented by the model are within 5% of the measured flow, velocity, and depth recorded by the flow meters during the target wet weather event.

4.5 Design Storm

In general, modeled design storms are developed based on regionally accepted durations and frequencies. For example, regions in Florida or Washington are subject to sustained rain events and opt to utilize 24 hour design storm events with a return period of 2, 5 or 10 years, while Georgia and Arkansas are subject to more moderate rain events where engineers opt to utilize a 12 hour design storm with a return period of 5 or 10 years. Most hydraulic models developed for municipalities in Texas utilize a 5-year 6-hour design storm for capacity analysis.

A synthetic 5-year 6-hour design storm was developed for this hydraulic model using a shape that is consistent with other hydraulic models developed in this region. Isohyetal maps in Technical Paper No. 40 (TP-40) published by the U.S. Department of Commerce show that a 5-year 6-hour storm for the City of Kyle is defined as 4.3 inches of rain in 6 hours. A TP-40 rainfall intensity curve was created for a cumulative rainfall of 4.3 inches of rain over a 6 hour period and the hyetograph utilized for the model. Figure 4.5.1 graphically shows the 5-year 6-hour storm hyetograph that utilized for this model. The design storm created in the model can be used to predict system performance in the collection system during such a rain event.

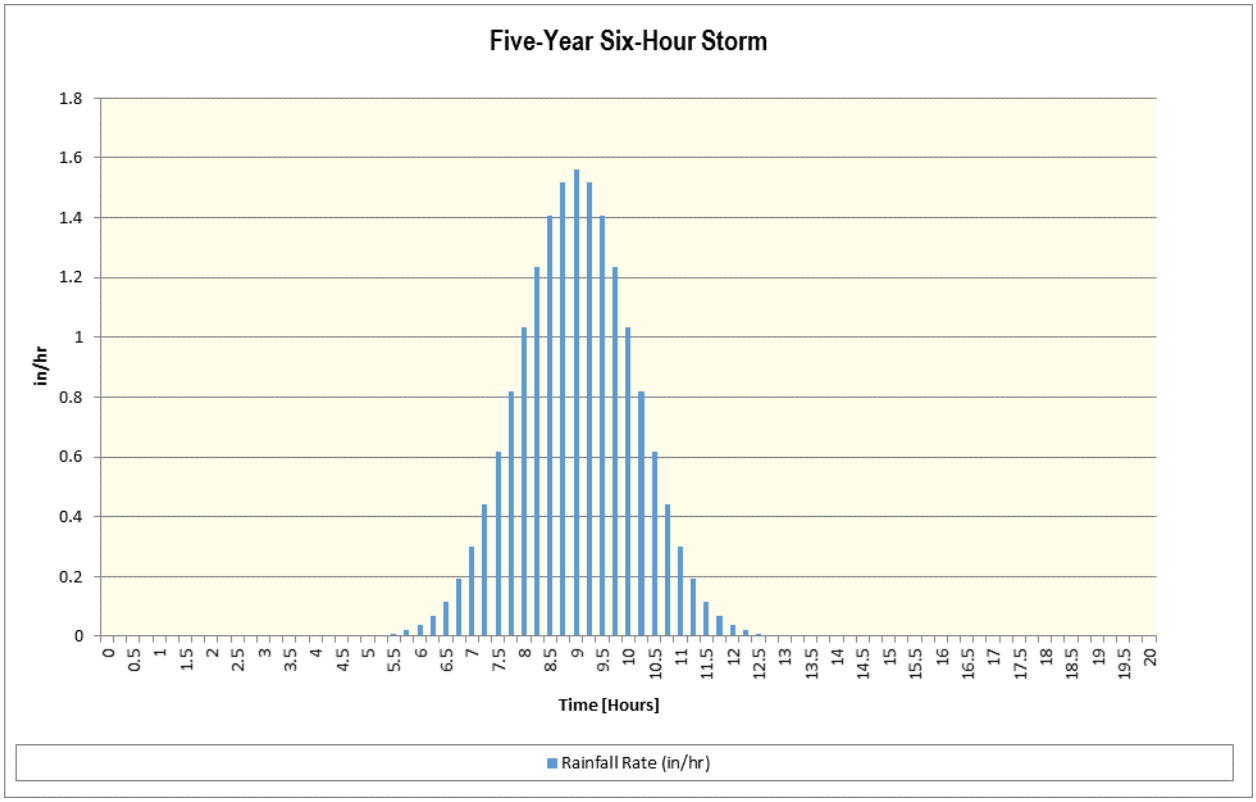


Figure 4.5.1 – Five-Year Six-Hour Storm Hyetograph created in SewerGEMS®

4.6 Hydraulic Model Future Improvements

The SewerGEMS® modeling software is capable modeling a number of features that occur in a typical wastewater collection system. However, any model is only as good as the information that it is based on. Therefore, it is a very important part of the overall process to insure that the data used to construct the model is as accurate as it can be and that population, flow, and rainfall data is equally accurate. To this end, we offer suggestions for improvements to the data utilized to prepare this model.

1. Collect global positioning system (GPS) survey points and elevation information for each modeled node.

2. Perform an above ground and pipe reconnaissance on the modeled pipelines to confirm pipeline material, diameter, and connectivity.

3. Conduct manhole/pipeline visual inspections to determine the nature and extent of any observable pipe hydraulic or structural problems.

4. Install and maintain a network of permanent flow monitoring and rainfall stations in the collection system.

5. Keep GIS records updated with all GPS node data, invert elevations, pipe connectivity, pipe size, pipe material, and all new connections into the collection system.

5.0 Identification of System Deficiencies

One of the main reasons to conduct a hydraulic modeling exercise on a wastewater collection system is to identify major areas where hydraulic restrictions exist. Identification of these macro areas is paramount to the decision making process. In order to identify these areas in the collection system, an evaluation of the dry weather and wet weather modeled flow regimes was conducted. This evaluation consisted of running the model using the model population distribution at current conditions for dry and observed wet weather conditions. This evaluation was conducted without any improvements to the system. Performance of this analysis provides the following results.

Under dry weather conditions, the model results indicate that there are no major problem areas in the current collection system. A dry/wet weather analysis was developed which focused on evaluating hydraulic performance of the sanitary sewer system due to increasing population under both dry and wet weather conditions. This analysis enables the City of Kyle and B&N to determine capacity improvements for dry weather system capacity needs based on system expansion and population increases. Wastewater collection system capacities are determined with a wet weather peaking factor (also known as allowable I/I). Therefore, identification of major problem areas during wet weather simulations is the focus of designating improvements to the collection system. The wet weather simulations were run using saturated antecedent ground conditions, the 5-year 6-hour design storm, and the RDII factor developed during wet weather calibration of the model. This combination produces the worst case (most conservative) set of conditions under which the collection system must operate.

In the figures that follow, the model results from this conservative wet weather analysis are presented. The bold red lines represent pipes in the existing collection system that are hydraulically deficient in some manner. Hydraulic deficiency is generally caused by two factors. One is capacity limitations, meaning that the pipes cannot convey the wastewater being generated due to pipe size, pipe slope, or both. The second is caused by downstream restrictions such as an undersized lift station or a capacity restricted pipe segment. During the analysis, pipes were considered to be surcharged if the level of wastewater in the system exceeded two feet above the crown of the pipe at any time during the analysis period.

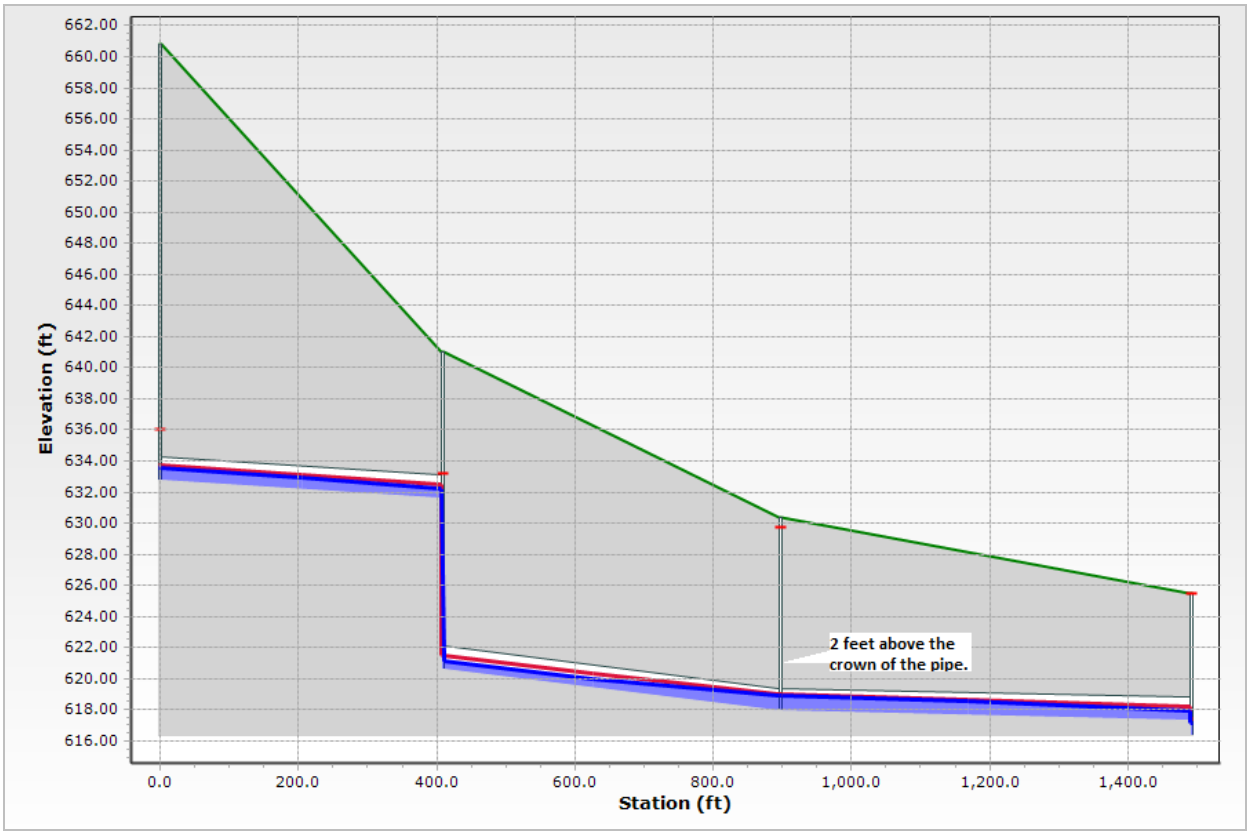


Figure 5.0.1: Surcharging Improvement Criteria

The existing treatment plant and existing lift stations at the plant were removed from the model as well during these simulations. This allows for examination of system performance during these simulations without the affects of these known hydraulic restrictions.

In order to develop the logic for presentation of recommended improvements to the wastewater collection system, criterion must be developed for comparison to the modeled conditions. Pipelines and manholes that do not meet the criteria set forth are flagged for further detailed analysis. **It should be noted that pipe segments that exceed a certain criterion do not necessarily require rehabilitation, just further evaluation.** Development of improvement criteria is generally the subject of significant discussion and debate. **The criterion listed below was utilized for identifying areas where system improvements may be required. Once areas of system improvements were identified, further analysis was performed to determine the nature and extent of recommendations for improvements.**

The same criterion was used for both dry weather and design storm analysis. The basic criterion only requires that the maximum wastewater level cannot exceed 2-foot above the crown of the highest pipe crown connected to the manhole. If this elevation is higher than the manhole rim elevation then the maximum water level is required to remain below the manhole rim elevation. Figure 5.0.1 illustrates an example of the criterion used.

A number of criterions were observed when developing improvements to the collection system. The major influencing criteria are:

- Minimum Velocity in a pipe of 2.0 feet per second
- Maximum Distance between Manholes of 500 feet
- Peak Wet Weather Flow Shall Not Exceed 90% of Full Pipe Capacity for Pipes 15" and Smaller
- Peak Wet Weather Flow Shall not Exceed 95% of Full Pipe Capacity for Pipes 18" and Larger

In addition to the criterion used to determine the need for system improvements, a number of methods for improvements were examined. These included, enlarging the existing pipe in the same trench, paralleling the existing line segment, and use of in-line storage. **Other improvements, such as major flow rerouting were not fully investigated as a part of this report due to a lack of solid planning information.**

In figures 5.0.2 – 5.0.5 on the following pages, major wet weather system issues as identified in the model results are presented. There were a number of smaller hydraulic deficiencies represented in the model results for these wastewater hydraulic model simulations.

Following the presentation of wet weather system issues identified during calibrated wet weather events, known proposed new developments were added to the existing system (see Section 6.0). Known developments are additional known expansions to the City of Kyle at the time this report was developed.

Figure 5.0.2
Surcharged Pipes During Wet Weather
Problem Areas With Current Infrastructure
City of Kyle Wastewater Collection System

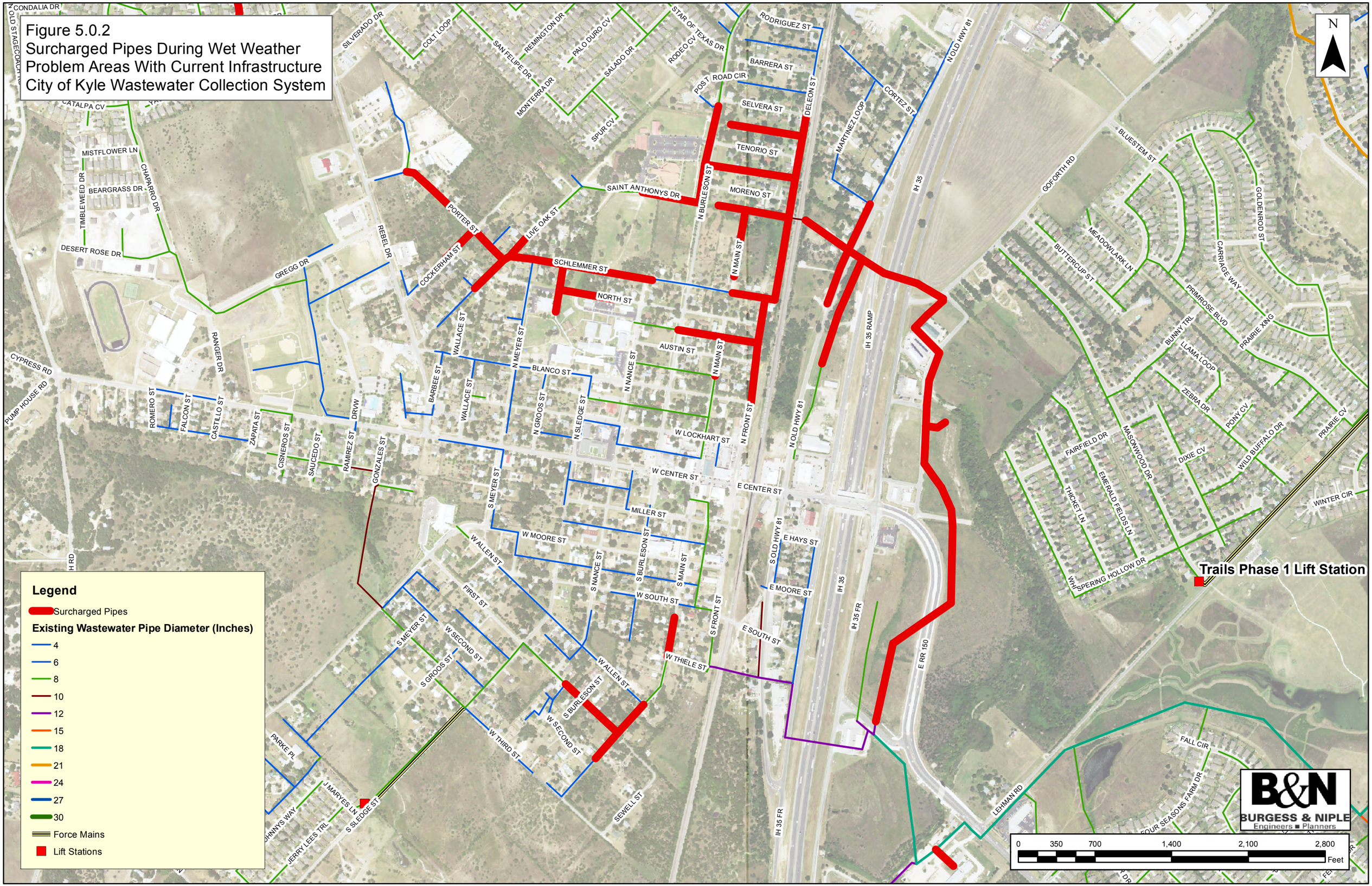


Figure 5.0.3
Surcharged Pipes During Wet Weather
Problem Areas With Current Infrastructure
City of Kyle Wastewater Collection System

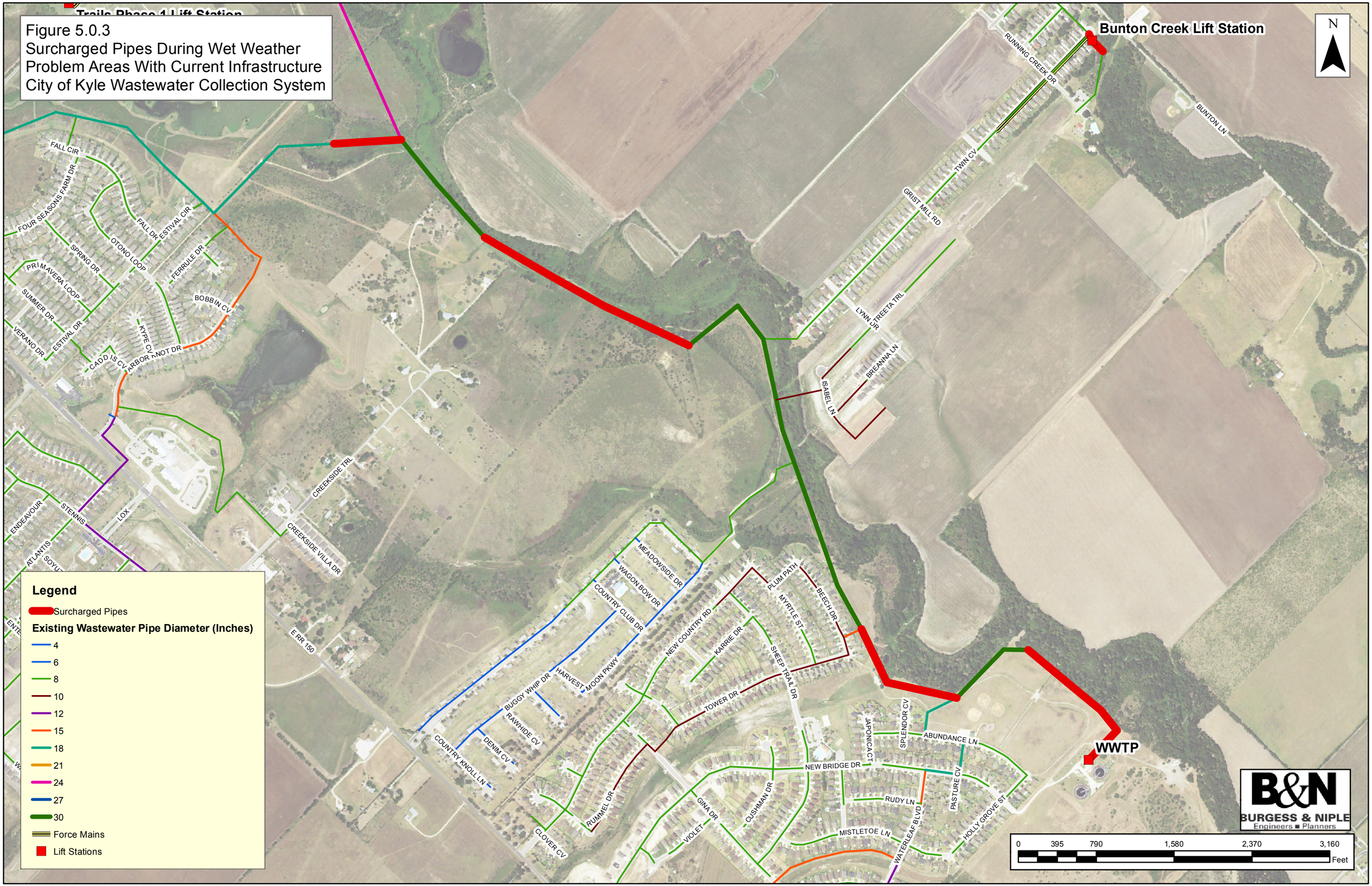


Figure 5.0.4
Surcharged Pipes During Wet Weather
Problem Areas With Current Infrastructure
City of Kyle Wastewater Collection System

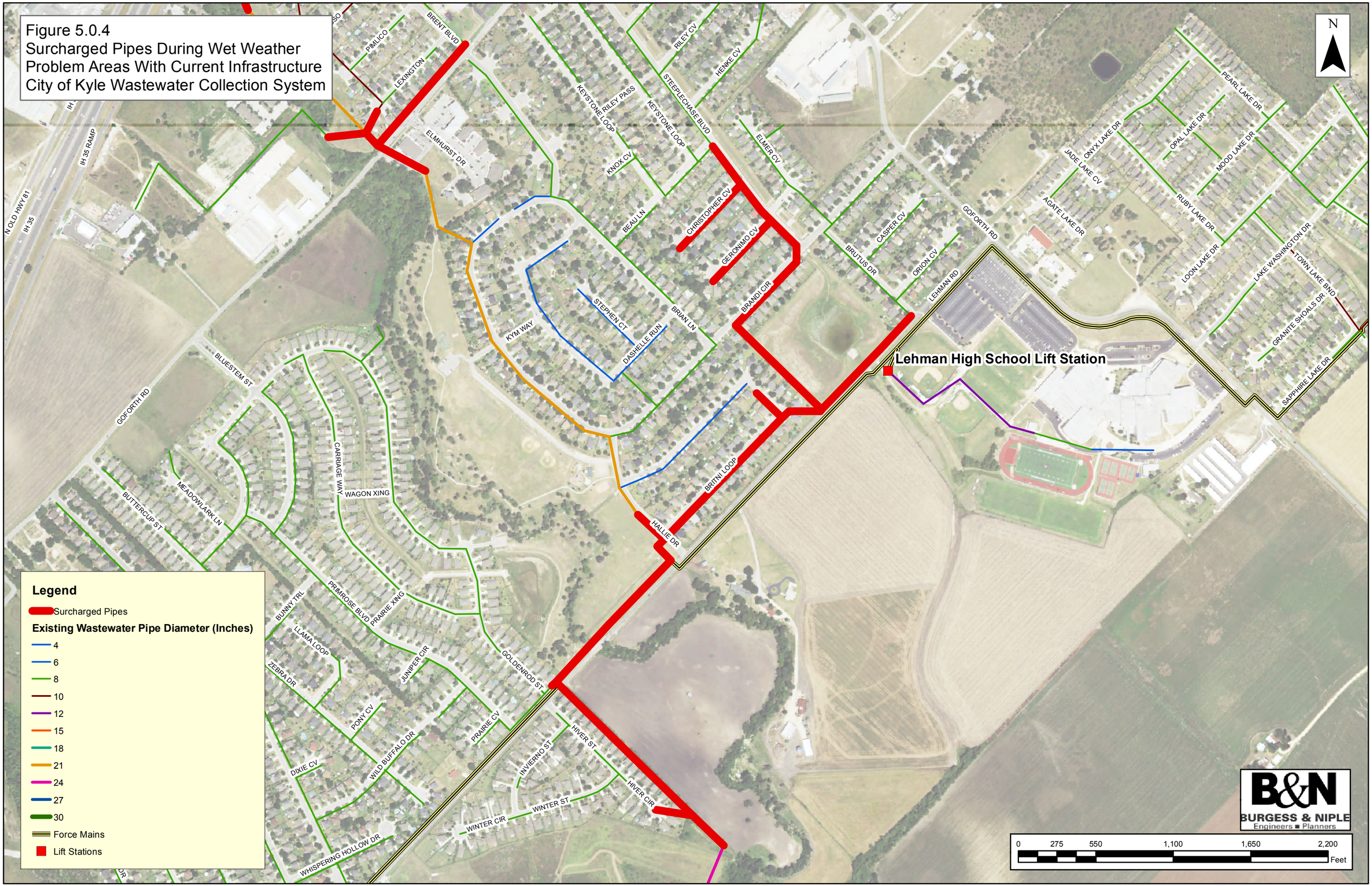
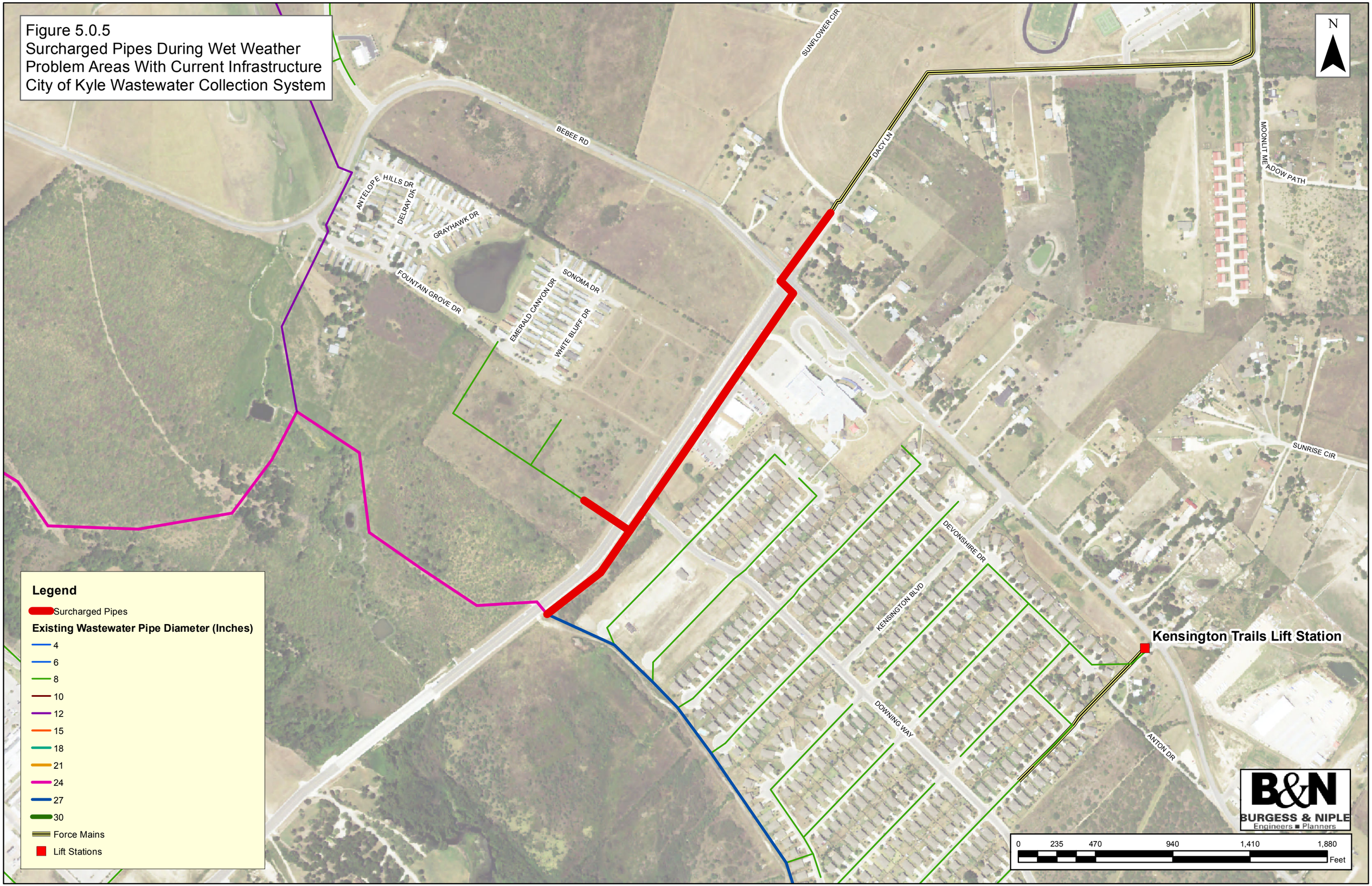


Figure 5.0.5
Surcharged Pipes During Wet Weather
Problem Areas With Current Infrastructure
City of Kyle Wastewater Collection System



6.0 Development Scenarios

Using alternatives analysis in SewerGEMS®, B&N projected future demands during dry and wet weather, investigated different pipe alignments, and compared the system performance when adding new developments and/or additional pipe. Alternatives analysis allows for exploration of the entire wastewater system when adding any number of new developments and is used as a tool for determining what improvements need to be constructed in order to prevent hydraulic bottlenecks, surcharged pipes, and manhole overflows.

Several specific simulations were evaluated to determine the best route for the Blanco River Ranch and Cypress Forest Developments, to evaluate the affect that the proposed Elliot Branch and Bunton Creek interceptors would have on the system, and show which collection system improvements would need to be implemented to bring a new developments on-line while maintaining system performance.

Upon completion of the addition of known developments to the model, B&N prepared recommendations for improvements to the collection system. These improvements are based on the criterion discussed in previous sections of this report and are sized to carry the base wastewater flow generated by existing populations and future populations associated with these known developments, as well as allowable I/I generated by the 5-year 6-hour design storm.

6.1 Known New Developments

Information needed to run simulations for a new development in the model include:

- Total developed land area base loading or total Living Unit Equivalents (LUEs),
- Connection point(s) into the existing wastewater system, and any large or special wastewater generators.

This information is used to develop subcatchments (similar to the subcatchments prepared for the existing collection system) for the proposed development. A standard set of parameters are developed to create the volume and rate of allowable I/I entering the system. These values are combined to determine the new wastewater loading that will be generated by the new development during wet weather events. Proposed land use and property zoning classifications are used to estimate populations and confirm LUE computations. Then the proposed development is connected to the existing system at a geospatially feasible location. Simulations are run for dry and wet weather, and a 5-year 6-hour design storm conditions.

Once all the known developments are built into the model, dry weather, wet weather, and design storm scenarios can be run and the results can be used to show how these new additions impact existing system performance. Known future developments that were modeled are listed on the following page:

- Anthem
- Perry Blanton Addition
- Plum Creek's Final Phase
- Brooks Crossing
- Post Oak full build- out
- Cool Springs
- Kensington Trail Final Phase
- Hays Commerce Park
- Creekside at Bunton Creek
- Blanco River Ranch
- La Salle
- Plum Creek Apartments
- Creekside Village
- Villas at Creekside Phase 2
- Kyle Estate
- Sunset Hills
- Meadow & Kyle Final Phases
- Bunton Creek Final Phases
- Cypress Forest
- Aztec
- Vista at Plum Creek
- Oaks on Goforth Apartments
- Brookside Phase 2
- Lehman Tract
- The Strand Apartments
- Crosswinds MUD

Different connection points and alignments were analyzed and compared for Blanco River Ranch and Cypress Forest proposed development. Model simulations including all the listed developments were run. Pipes that exceeded criteria were mapped in ArcGIS as bold red lines in the figures that follow. Pipe segments exhibiting hydraulic issues were improved in the model and the simulations were run to confirm the validity of the proposed improvements.

6.2 Blanco River Ranch and Cypress Forest Scenario

Two different wastewater routes were considered for the Blanco River Ranch and Cypress Forest developments to tie into the existing collection system. The first option was to tie the new developments into the Hometown subdivision as shown in Figure 6.2.1 on the following page. The second option was to bring the proposed wastewater line south and tie into the Elliot Branch Interceptor as shown in Figure 6.2.2, following Figure 6.2.1. Running the model during wet weather revealed that several improvements would need to be made to the collection system in order to convey peak flows from these new developments with existing loads in either case.

Option 1 requires pipes between the proposed Brooks Crossing development and the new Blanco River Ranch/ Cypress Forest interceptor be upgraded to 21 inches and the pipes from the tie-in point in the Hometown Subdivision to Brooks Crossing be upgraded to an 18 inch pipe. Option 2 requires the Elliot Branch Interceptor to be built and approximately 7,500 linear feet of pipe to connect BRR and Cypress Forest to the Elliot Branch interceptor. The pipes between the proposed Brooks Crossing development and the new Blanco River Ranch/ Cypress Forest interceptor will still need to be upgraded to 21 inches to add the Brooks Crossing development. Table 6.2.1 below shows the proposed pipe footage and the length of pipes that need to be upsized for both options. The new pipe values shown for Option 2 include the Elliot Branch Interceptor.

Table 6.2.1: Blanco River Ranch Summary of pipe improvements for option 1 and option 2.

	New Pipe (LF)	Upsized Pipe (LF)	Total Pipe Improvements (LF)
Option 1	1,800	8,500	10,300
Option 2	19,500	4,300	23,800

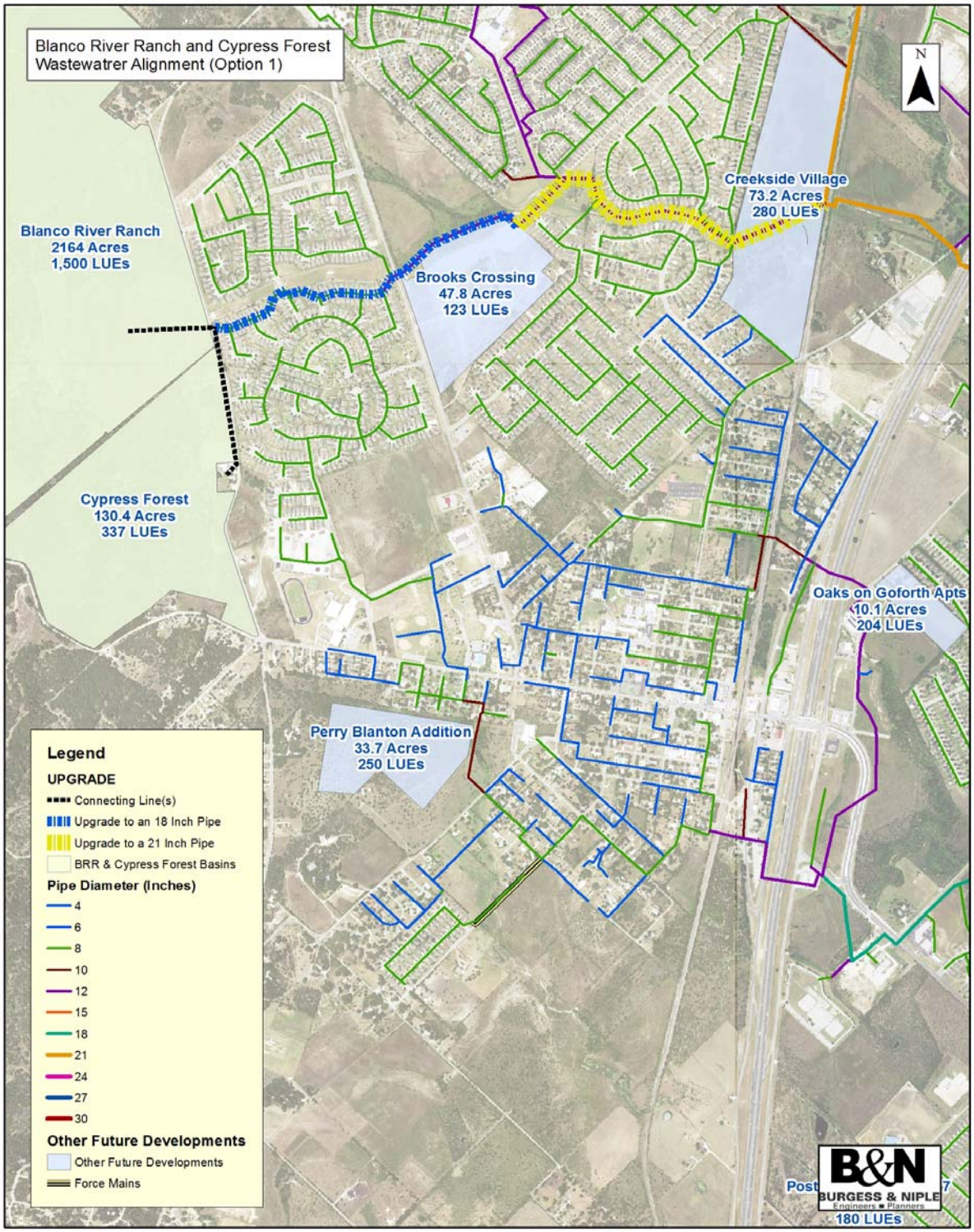


Figure 6.2.1: Blanco River Ranch and Cypress Forest alternate pipe route scenarios option 1.

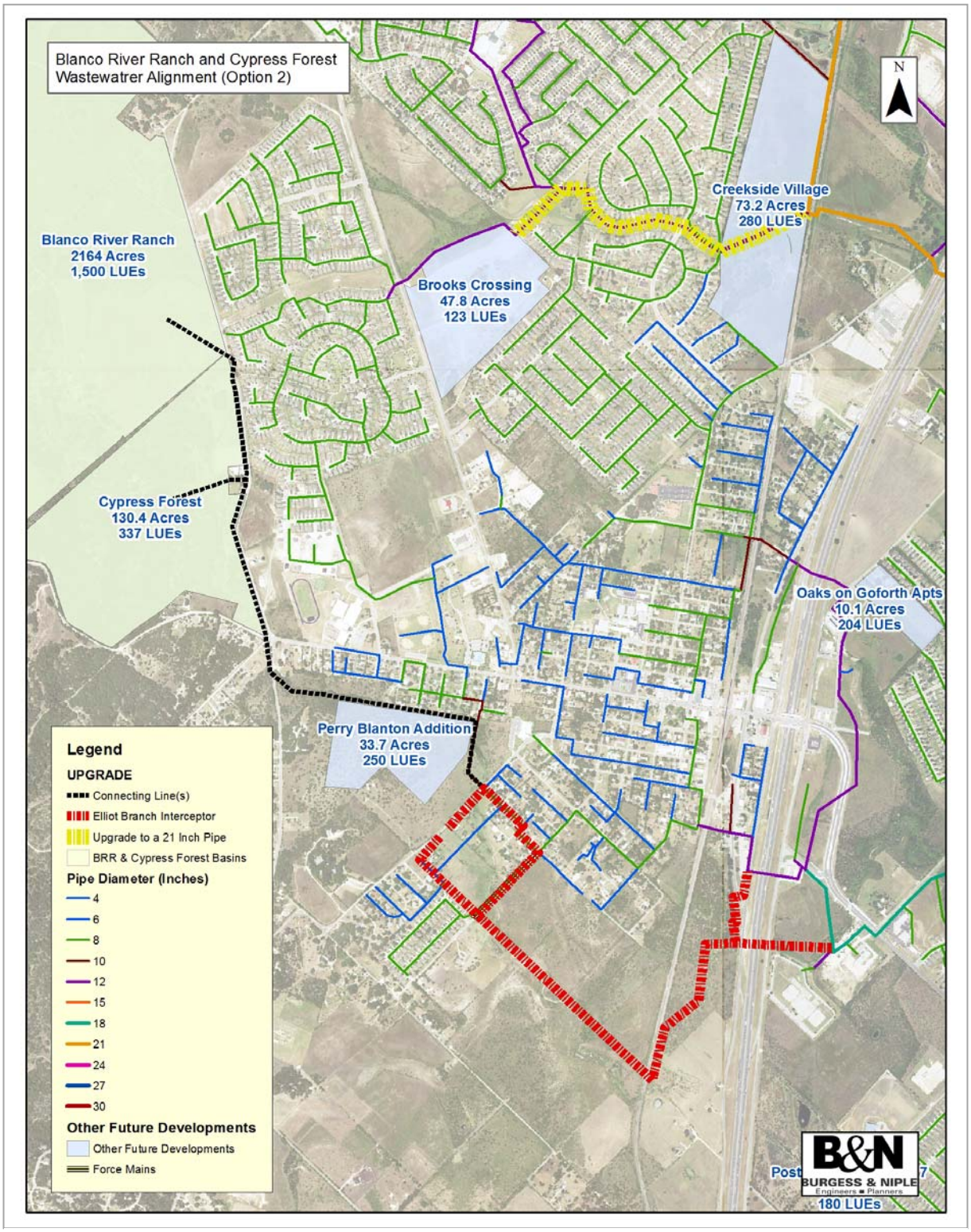


Figure 6.2.2: Blanco River Ranch and Cypress Forest alternate pipe route scenarios option 2.

6.3 New Development Model Simulation

In order to convey wet weather flows from all of the known developments currently being contemplated in the City of Kyle, a number of system improvements are required. These improvements are discussed in section 10 and were developed as groups of individual projects that would be required as these new developments are constructed. Table 6.3.1 lists the various parameters that were used to simulate the new developments in the model. Should these parameters change or be revised significantly, the model simulations should be re-run in order to confirm validity of the recommended improvement projects. Living Unit Equivalence (LUE) is converted to million gallons per day (MGD) by multiplying the LUEs by 3.5 people/ unit and 80 gallons per person per day.

Table 6.3.1: Summary of Known Developments

Scenario Identification	Basin Area	Projected LUE	Dry Weather Average Daily Flow (MGD)	Wet Weather Peak Flow (MGD)
Anthem	672	1,500	0.420	2.1
Aztec	81	850	0.238	0.8
Blanco River Ranch [1]	2164	1,500	0.420	1.9
Brooks Crossing	47.8	123	0.034	0.13
Brookside Phase 2	36.2	220	0.062	0.31
Bunton Creek remaining phases	90.1	440	0.123	0.62
Cool Springs	125.2	372	0.104	0.42
Creekside at Bunton Creek	97.9	500	0.140	0.38
Creekside Village	73.2	280	0.078	0.31
Crosswinds MUD	443.6	1,750	0.490	1.8
Cypress Forest [1]	130.4	337	0.094	0.48
Hays Commerce Park	105.9	24	0.007	0.025
Kensington Trails remaining phases	33.7	110	0.031	0.16
Kyle Estate I	298.4	1,000	0.280	1.1
Kyle Estate II	330.0	1,200	0.336	1.4
La Salle MUD	2740.4	7,200	2.016	7.7
Lehman Tract	97.6	150	0.042	0.18
Meadows at Kyle Phases 4,5,6	51.4	350	0.098	0.24
Oaks on Goforth Apts	10.1	204	0.057	0.29
Perry Blanton Addition	33.7	250	0.070	0.35
Plum Creek	606.5	1,500	0.420	1.9
Post Oak Phase 5,6 & 7	35.6	180	0.050	0.25
Sunset Hills	53.2	177	0.050	0.14
The Strand Apartments	7.6	160	0.045	0.23
Trails at Plum Creek Apts	12.3	248	0.069	0.14
Villas at Creekside Phase 2	2.8	24	0.007	0.034
Vista at Plum Creek Apts Phase 2	7.4	180	0.050	0.25

[1]Indicates developments that were analyzed with several different alignments.

7.0 Recommendations

7.1 Wastewater Treatment Plant Improvement Phase 1

The Wastewater Treatment Plant Improvement Phase 1 Project includes upsizing fourteen (14) wastewater (30 to 54 inches). Table 7.1.1 lists the known developments added to the model that are drivers of this improvement project. Table 7.1.2 on the following page includes the original pipe and proposed design values for each line ID in this project. These recommendations are driven by the addition of proposed new developments; if all the developments are constructed, or number of LUE's are added, improvements are required.

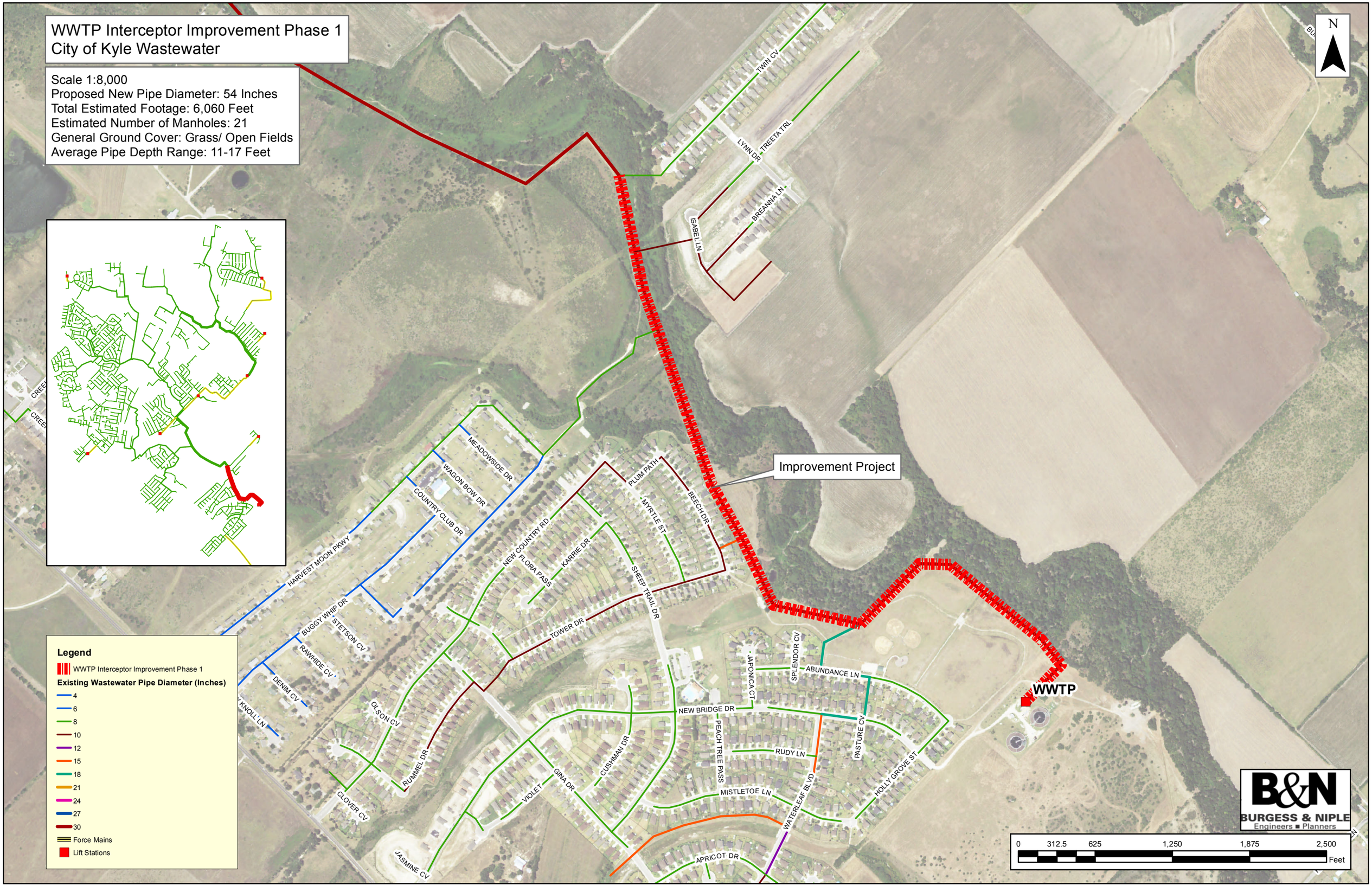
Table 7.1.1: Known Development Properties Driving Improvement
Wastewater Treatment Plant Improvement Phase 1

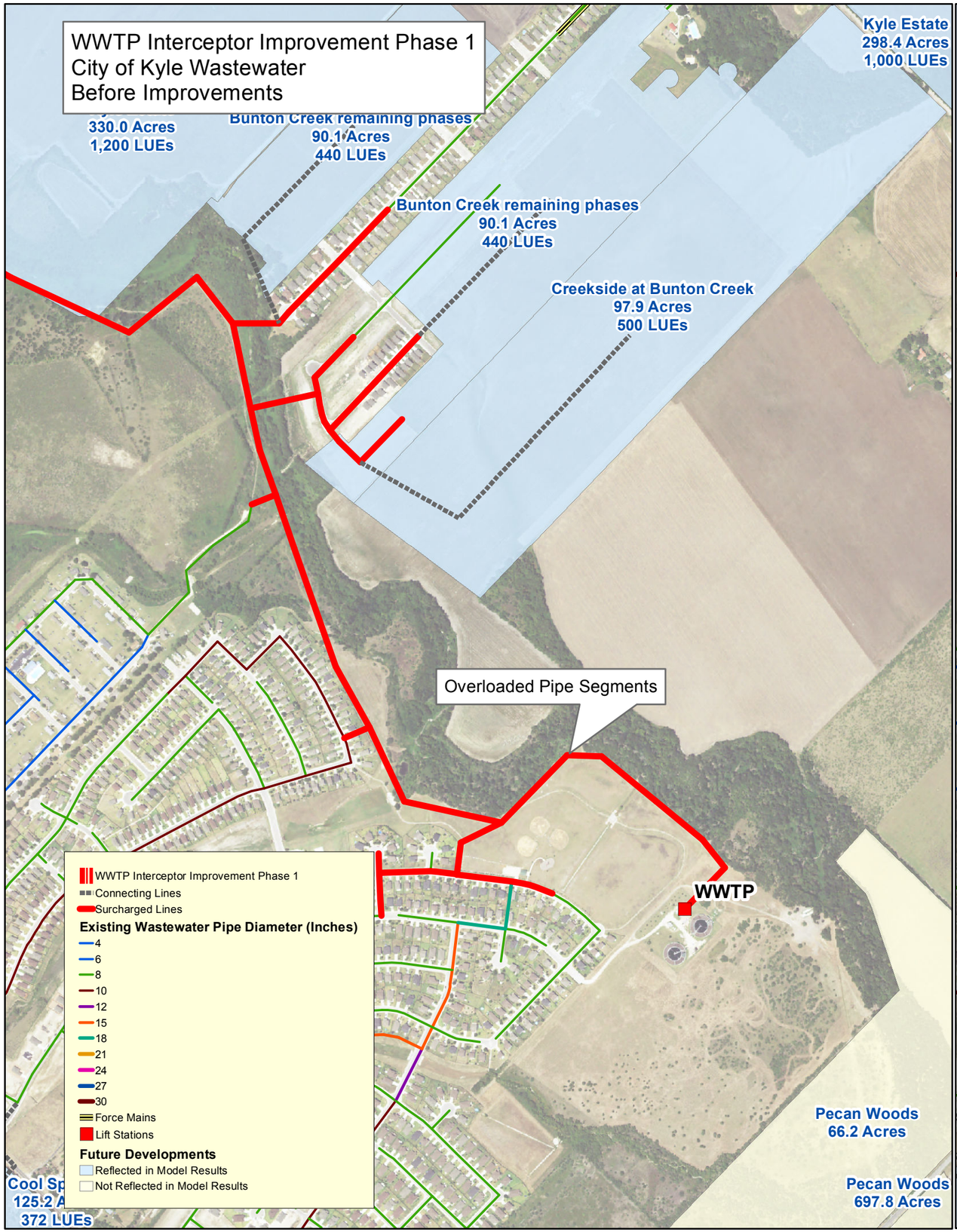
Scenario Identification	Basin Area (Acres)	Projected LUE	Dry Weather Average Daily Flow (MGD)	Wet Weather Peak Flow (MGD)
Anthem	672.0	1,500	0.420	2.10
Aztec	81.0	850	0.238	0.80
Blanco River Ranch	2,164.0	1,500	0.420	1.90
Brooks Crossing	47.8	123	0.034	0.13
Brookside Phase 2	36.2	220	0.062	0.31
Bunton Creek remaining phases	90.1	440	0.123	0.62
Cool Springs	125.2	372	0.104	0.42
Creekside at Bunton Creek	97.9	500	0.140	0.38
Creekside Village	73.2	280	0.078	0.31
Crosswinds MUD	443.6	1,750	0.490	1.80
Cypress Forest	130.4	337	0.094	0.48
Hays Commerce Park	105.9	24	0.007	0.03
Kensington Trails remaining phases	33.7	110	0.031	0.16
Kyle Estate I	298.4	1,000	0.280	1.10
Kyle Estate II	330.0	1,200	0.336	1.40
La Salle MUD	2,740.4	7,200	2.016	7.70
Lehman Tract	97.6	150	0.042	0.18
Meadows at Kyle Phases 4,5,6	51.4	350	0.098	0.24
Oaks on Goforth Apts	10.1	204	0.057	0.29
Perry Blanton Addition	33.7	250	0.070	0.35
Plum Creek	606.5	1,500	0.420	1.90
Post Oak Phase 5,6 & 7	35.6	180	0.050	0.25
Sunset Hills	53.2	177	0.050	0.14
The Strand Apartments	7.6	160	0.045	0.23
Trails at Plum Creek Apts	12.3	248	0.069	0.14
Villas at Creekside Phase 2	2.8	24	0.007	0.03
Vista at Plum Creek Apts Phase 2	7.4	180	0.050	0.25
Total	**8,388.0**	**20,829.0**	**5.832**	**23.64**

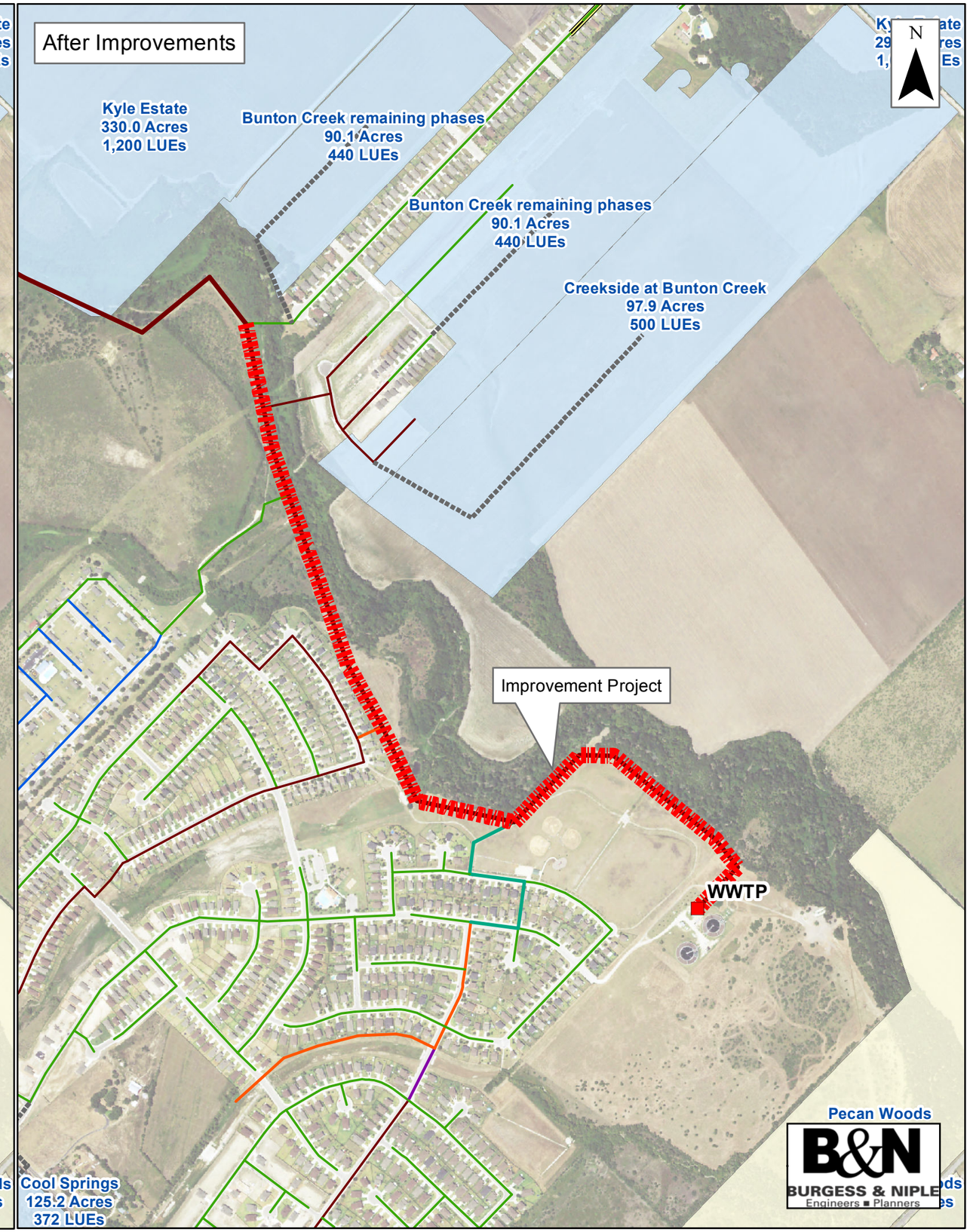
Table 7.1.2: Summary of Recommended Improvements Wastewater Treatment Plant Improvement Phase 1									
Line ID	Modified Parameter	Original Values				Proposed Values			
		Diameter	Upstream Elevation	Downstream Elevation	Slope	Diameter	Upstream Elevation	Downstream Elevation	Slope
1998.1	Diameter	30	604.58	601.12	0.63%	54	604.58	601.12	0.63%
2087.1	Diameter	30	601.12	600.68	0.16%	54	601.12	600.68	0.16%
2088.1	Diameter	30	600.68	600.32	0.12%	54	600.68	600.32	0.12%
2089.1	Diameter	30	600.00	597.70	0.29%	54	600.00	597.70	0.29%
2085.1	Diameter	30	597.00	594.75	0.44%	54	597.00	594.75	0.44%
2090.1	Diameter	30	594.75	593.90	0.14%	54	594.75	593.90	0.14%
2091.1	Diameter	30	593.90	592.83	0.18%	54	593.90	592.83	0.18%
2092.1	Diameter	30	592.83	591.90	0.43%	54	592.83	591.90	0.43%
2093.1	Diameter	30	591.90	589.53	0.53%	54	591.90	589.53	0.53%
2094.1	Diameter	30	589.53	589.23	0.08%	54	589.53	589.23	0.08%
2095.1	Diameter	30	589.23	588.30	0.41%	54	589.23	588.30	0.41%
2096.1	Diameter	30	588.30	588.27	0.03%	54	588.30	588.27	0.03%
2086.1	Diameter	30	597.70	597.00	0.16%	54	597.70	597.00	0.16%
2196.1	Diameter	30	600.32	600.00	0.09%	54	600.32	600.00	0.09%

WWTP Interceptor Improvement Phase 1
City of Kyle Wastewater

Scale 1:8,000
Proposed New Pipe Diameter: 54 Inches
Total Estimated Footage: 6,060 Feet
Estimated Number of Manholes: 21
General Ground Cover: Grass/ Open Fields
Average Pipe Depth Range: 11-17 Feet




WWTP Interceptor Improvement Phase 1
City of Kyle Wastewater
Before Improvements
Kyle Estate
298.4 Acres
1,000 LUEs
330.0 Acres
1,200 LUEs
Bunton Creek remaining phases
90.1 Acres
440 LUEs
Bunton Creek remaining phases
90.1 Acres
440 LUEs
Creekside at Bunton Creek
97.9 Acres
500 LUEs
Overloaded Pipe Segments
WWTP
Pecan Woods
66.2 Acres
Pecan Woods
697.8 Acres
Cool Sp
125.2 A
372 LUEs
WWTP Interceptor Improvement Phase 1
Connecting Lines
Surcharged Lines
Existing Wastewater Pipe Diameter (Inches)
4
6
8
10
12
15
18
21
24
27
30
Force Mains
Lift Stations
Future Developments
Reflected in Model Results
Not Reflected in Model Results


After Improvements
N
Kyle Estate
330.0 Acres
1,200 LUEs
Bunton Creek remaining phases
90.1 Acres
440 LUEs
Bunton Creek remaining phases
90.1 Acres
440 LUEs
Creekside at Bunton Creek
97.9 Acres
500 LUEs
Improvement Project
WWTP
Pecan Woods
Cool Springs
125.2 Acres
372 LUEs
B&N
BURGESS & NIPLE
Engineers ■ Planners

7.2 Wastewater Treatment Plant Improvement Phase 2

The Wastewater Treatment Plant Improvement Phase 2 Project includes upsizing eight (8) existing wastewater pipes from 30 inches to 54 inches. Table 7.2.1 lists the known developments added to the model that are drivers of this improvement project. Table 10.2.2 shows the original pipe parameter values and proposed design values for each line ID in this improvement project. These recommendations are driven by the addition of proposed new developments; if all the developments are constructed, or number of LUE's are added, improvements are required.

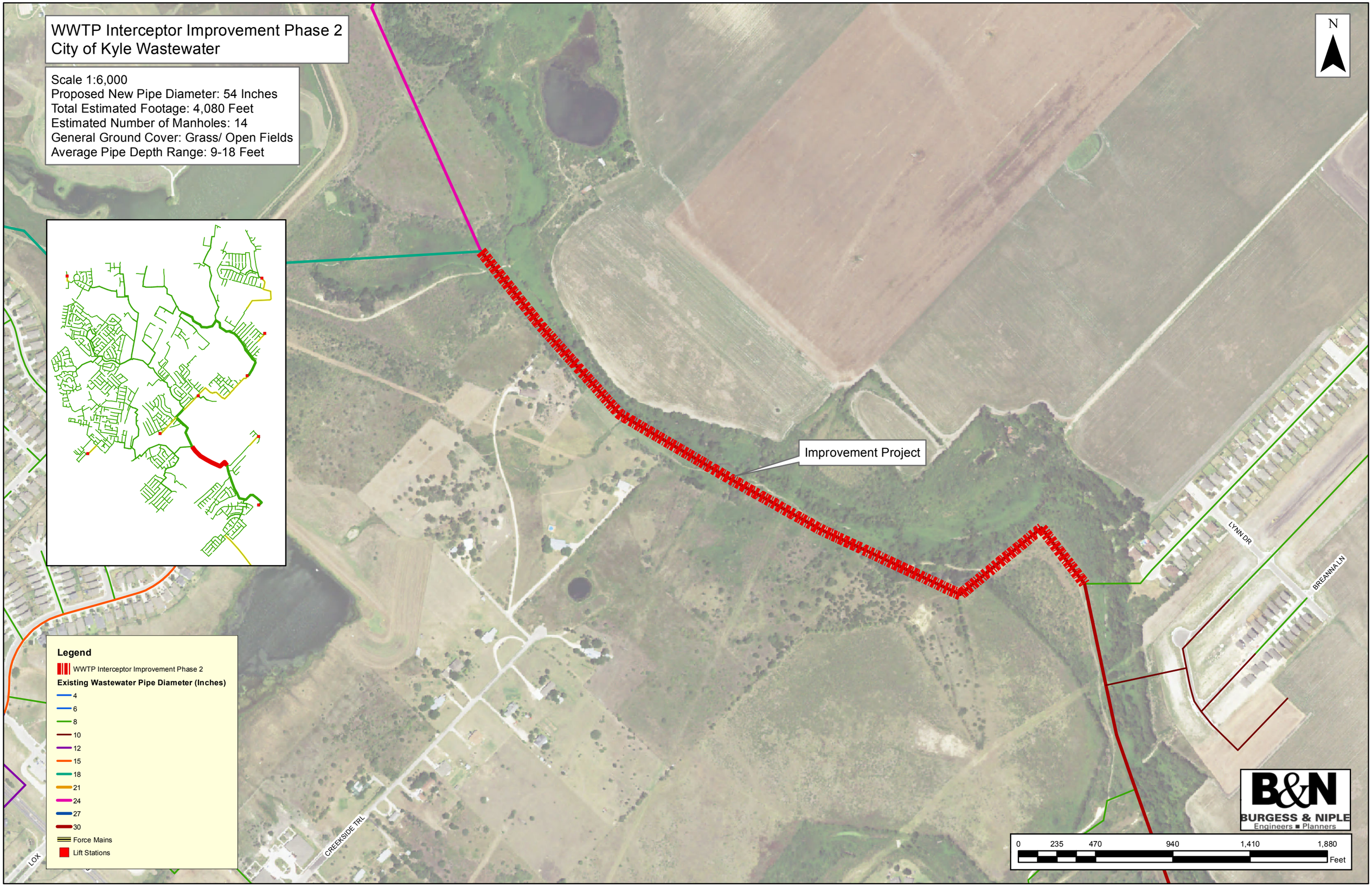
Table 7.2.1: Known Development Properties Driving Improvement
Wastewater Treatment Plant Improvement Phase 2

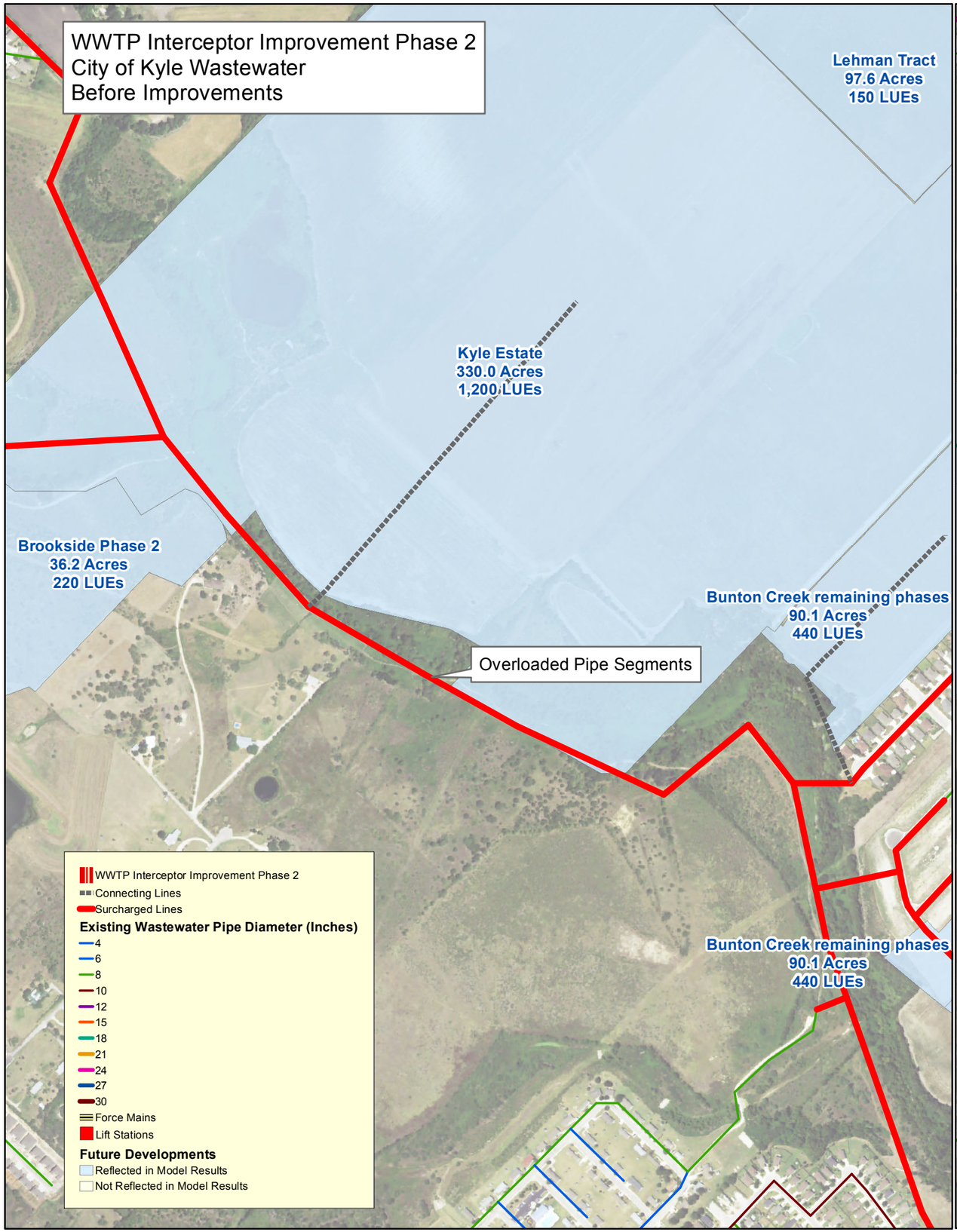
Scenario Identification	Basin Area (Acres)	Projected LUE	Dry Weather Average Daily Flow (MGD)	Wet Weather Peak Flow (MGD)
Anthem	672.0	1,500	0.420	2.10
Aztec	81.0	850	0.238	0.80
Blanco River Ranch	2,164.0	1,500	0.420	1.90
Brooks Crossing	47.8	123	0.034	0.13
Brookside Phase 2	36.2	220	0.062	0.31
Creekside Village	73.2	280	0.078	0.31
Crosswinds MUD	443.6	1,750	0.490	1.80
Cypress Forest	130.4	337	0.094	0.48
Hays Commerce Park	105.9	24	0.007	0.03
Kensington Trails remaining phases	33.7	110	0.031	0.16
Kyle Estate II	330.0	1,200	0.336	1.40
La Salle MUD	2,740.4	7,200	2.016	7.70
Lehman Tract	97.6	150	0.042	0.18
Meadows at Kyle Phases 4,5,6	51.4	350	0.098	0.24
Oaks on Goforth Apts	10.1	204	0.057	0.29
Perry Blanton Addition	33.7	250	0.070	0.35
Plum Creek	606.5	1,500	0.420	1.90
Post Oak Phase 5,6 & 7	35.6	180	0.050	0.25
Sunset Hills	53.2	177	0.050	0.14
The Strand Apartments	7.6	160	0.045	0.23
Trails at Plum Creek Apts	12.3	248	0.069	0.14
Villas at Creekside Phase 2	2.8	24	0.007	0.03
Vista at Plum Creek Apts Phase 2	7.4	180	0.050	0.25
Total	**7,776.4**	**18,517.0**	**5.185**	**21.11**

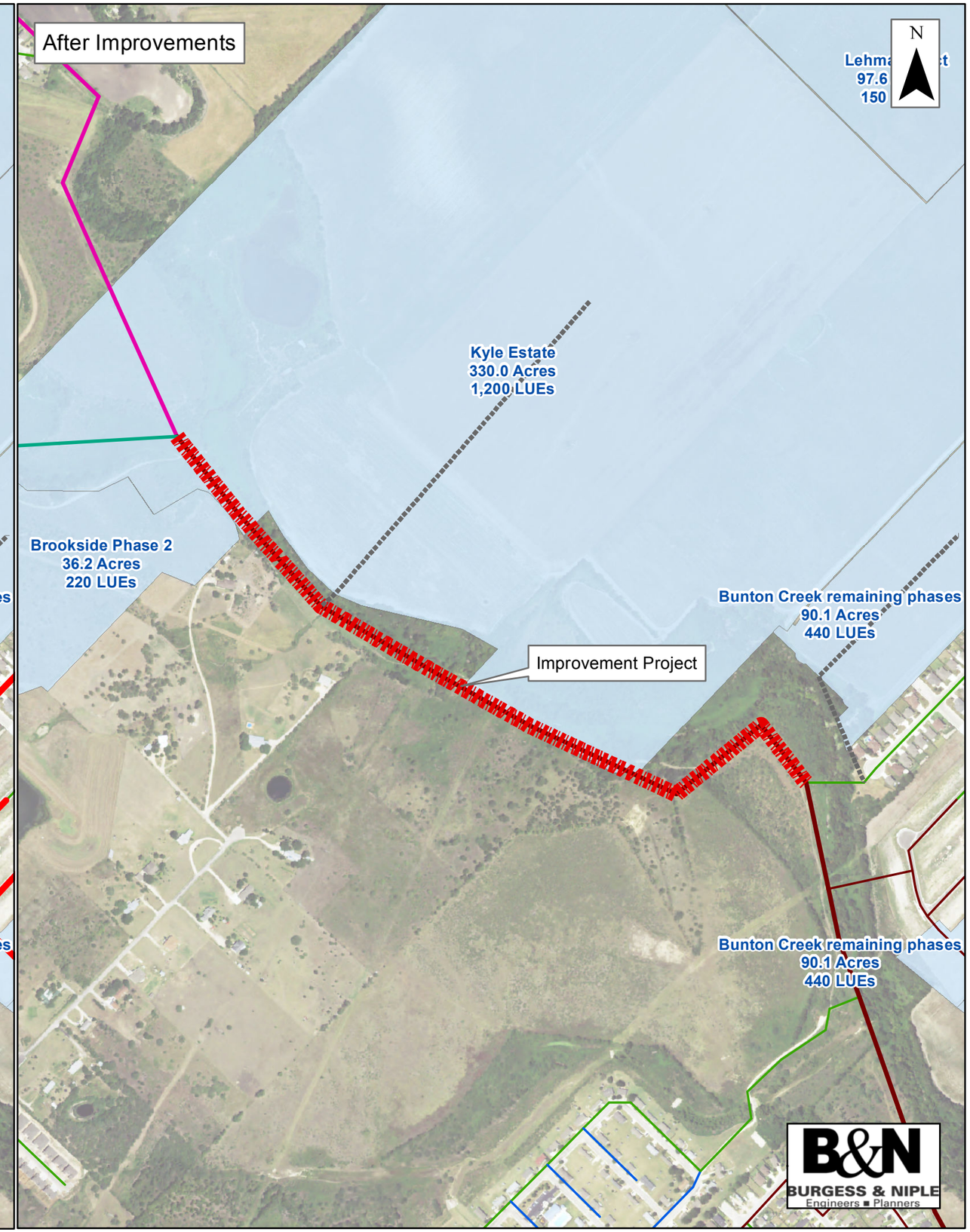
Table 7.2.2: Summary of Recommended Improvements Wastewater Treatment Plant Improvement Phase 2									
Line ID	Modified Parameter	Original Values				Proposed Values			
		Diameter	Upstream Elevation	Downstream Elevation	Slope	Diameter	Upstream Elevation	Downstream Elevation	Slope
1987.1	Diameter	30	616.34	615.13	0.38%	54	616.34	615.13	0.38%
2097.1	Diameter	30	614.46	612.10	0.38%	54	614.46	612.10	0.38%
1993.1	Diameter	30	612.10	609.60	0.38%	54	612.10	609.60	0.38%
1994.1	Diameter	30	609.90	609.40	0.09%	54	609.90	609.40	0.09%
1995.1	Diameter	30	609.40	608.91	0.06%	54	609.40	608.91	0.06%
1996.1	Diameter	30	608.91	605.90	0.54%	54	608.91	605.90	0.54%
1997.1	Diameter	30	605.90	604.58	0.36%	54	605.90	604.58	0.36%
2273.1	Diameter	30	615.13	614.46	0.38%	54	615.13	614.46	0.38%

WWTP Interceptor Improvement Phase 2
City of Kyle Wastewater

Scale 1:6,000
Proposed New Pipe Diameter: 54 Inches
Total Estimated Footage: 4,080 Feet
Estimated Number of Manholes: 14
General Ground Cover: Grass/ Open Fields
Average Pipe Depth Range: 9-18 Feet




WWTP Interceptor Improvement Phase 2
City of Kyle Wastewater
Before Improvements
Lehman Tract
97.6 Acres
150 LUEs
Kyle Estate
330.0 Acres
1,200 LUEs
Brookside Phase 2
36.2 Acres
220 LUEs
Bunton Creek remaining phases
90.1 Acres
440 LUEs
Overloaded Pipe Segments
Bunton Creek remaining phases
90.1 Acres
440 LUEs
WWTP Interceptor Improvement Phase 2
Connecting Lines
Surcharged Lines
Existing Wastewater Pipe Diameter (Inches)
4
6
8
10
12
15
18
21
24
27
30
Force Mains
Lift Stations
Future Developments
Reflected in Model Results
Not Reflected in Model Results


After Improvements
N
Kyle Estate
330.0 Acres
1,200 LUEs
Brookside Phase 2
36.2 Acres
220 LUEs
Bunton Creek remaining phases
90.1 Acres
440 LUEs
Improvement Project
Bunton Creek remaining phases
90.1 Acres
440 LUEs
B&N
BURGESS & NIPLE
Engineers ■ Planners

7.3 Four Seasons Farms Interceptor Improvement

The Four Seasons Farms Interceptor Improvement Project includes upsizing nineteen (19) existing wastewater pipes from 18 inches to 24 inches. All of the developments used in the model for this scenario are listed on Table 7.3.1 along with their acreage, LUE's, average daily flow, and the wet weather peak flow. Table 7.3.2 shows the original pipe parameter values and proposed design values for each line ID in this improvement project. These improvement recommendations are primarily driven by the addition of the La Salle, Blanco River Ranch, Cypress Forest, Perry Blanton Developments, Post Oak Final Phases, Brookside Phase 2, and Villas at Creekside Phase 2. If all of the proposed developments listed above are constructed, or an equivalent number of LUE's are added to the collection system, then these improvements are required.

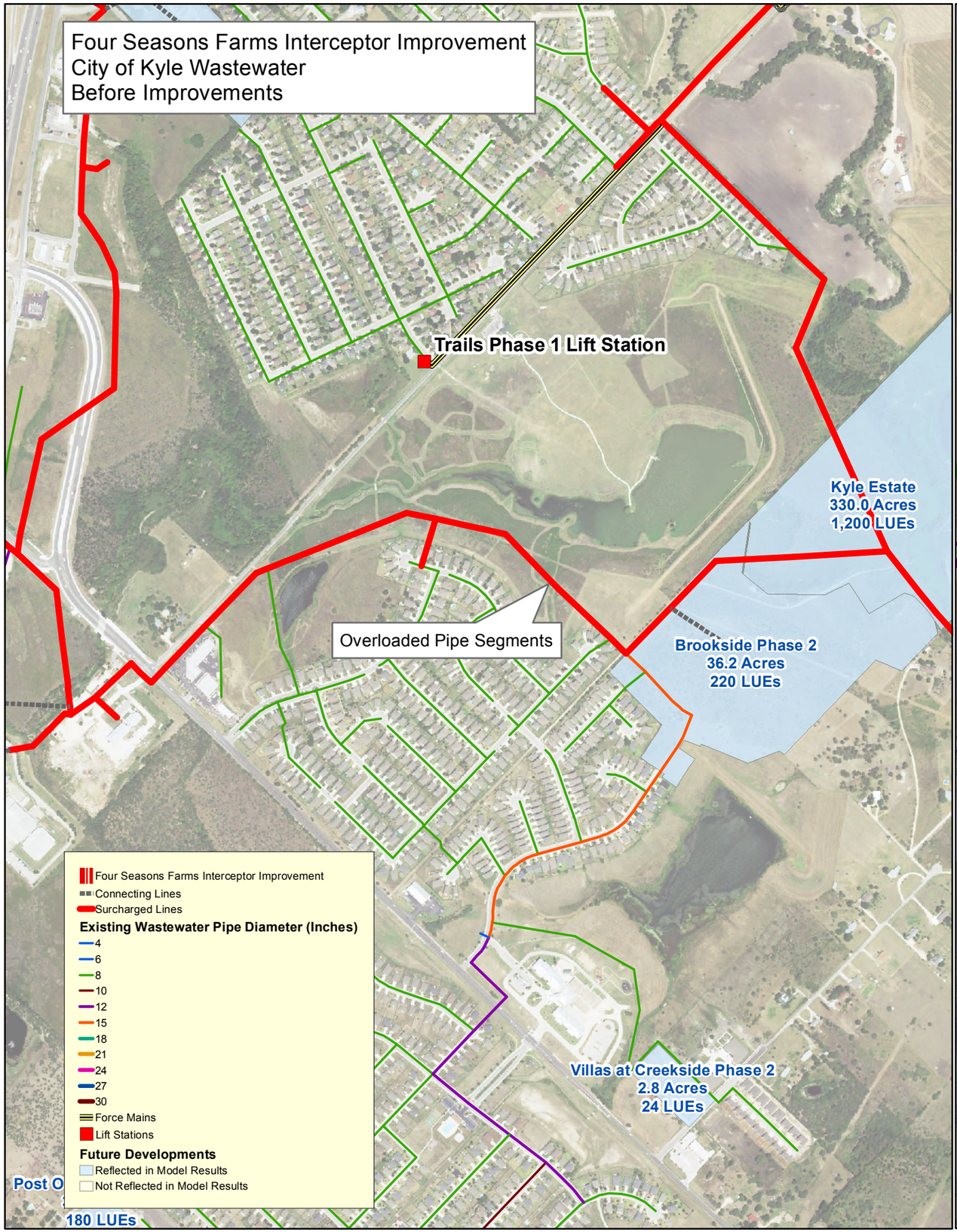
Table 7.3.1: Known Development Properties Driving Improvement
Four Seasons Farms Interceptor Improvement

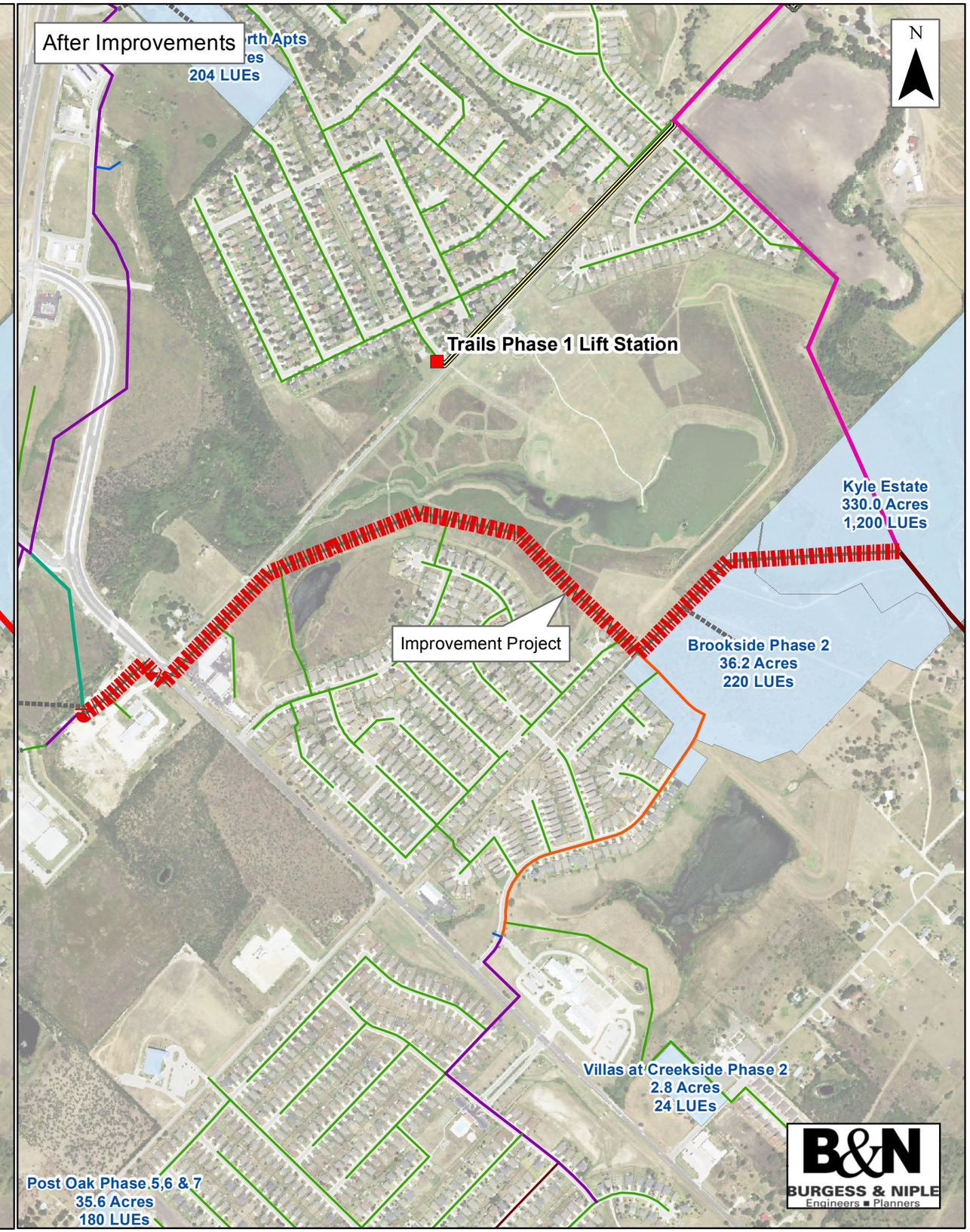
Scenario Identification	Basin Area (Acres)	Projected LUE	Dry Weather Average Daily Flow (MGD)	Wet Weather Peak Flow (MGD)
Aztec	81.0	850	0.238	0.80
Blanco River Ranch	2,164.0	1,500	0.420	1.90
Brookside Phase 2	36.2	220	0.062	0.31
Cypress Forest	130.4	337	0.094	0.48
La Salle MUD	2,740.4	7,200	2.016	7.70
Oaks on Goforth Apts	10.1	204	0.057	0.29
Perry Blanton Addition	33.7	250	0.070	0.35
Post Oak Phase 5,6 & 7	35.6	180	0.050	0.25
Villas at Creekside Phase 2	2.8	24	0.007	0.03
Total	**5,234.2**	**10,765.0**	**3.014**	**12.11**

Table 7.3.2: Summary of Recommended Improvements Four Seasons Farms Interceptor Improvement									
Line ID	Modified Parameter	Original Values				Proposed Values			
		Diameter	Upstream Elevation	Downstream Elevation	Slope	Diameter	Upstream Elevation	Downstream Elevation	Slope
754.1	Diameter	18	635.46	635.30	0.12%	24	635.46	635.30	0.12%
2274.1	Diameter	18	632.80	631.57	0.30%	24	632.80	631.57	0.30%
2191.1	Diameter	18	654.84	653.40	0.29%	24	654.84	653.40	0.29%
1282.1	Diameter	18	653.40	652.02	0.30%	24	653.40	652.02	0.30%
2189.1	Diameter	18	655.46	655.16	0.35%	24	655.46	655.16	0.35%
1989.1	Diameter	18	620.57	617.90	0.55%	24	620.57	617.90	0.55%
1988.1	Diameter	18	617.90	617.31	0.10%	24	617.90	617.31	0.10%
739.1	Diameter	18	639.16	637.51	0.36%	24	639.16	637.51	0.36%
1990.1	Diameter	18	637.51	636.10	0.30%	24	637.51	636.10	0.30%
1991.1	Diameter	18	636.10	635.46	0.14%	24	636.10	635.46	0.14%
2193.1	Diameter	18	641.20	639.45	0.30%	24	641.20	639.45	0.30%
1992.1	Diameter	18	639.45	639.26	0.10%	24	639.45	639.26	0.10%
235.1	Diameter	18	657.00	656.42	0.31%	24	657.00	656.42	0.31%
2015.1	Diameter	18	656.42	655.46	0.31%	24	656.42	655.46	0.31%
2186.1	Diameter	18	657.16	657.10	0.12%	24	657.16	657.10	0.12%
2192.1	Diameter	18	652.02	651.83	0.24%	24	652.02	651.83	0.24%
710.1	Diameter	18	651.84	641.20	3.02%	24	651.84	641.20	3.02%
2190.1	Diameter	18	655.16	654.94	0.24%	24	655.16	654.94	0.24%
1430.1	Diameter	18	635.30	632.80	0.62%	24	635.30	632.80	0.62%

Four Seasons Farms Interceptor Improvement
City of Kyle Wastewater

Scale 1:8,000
Proposed New Pipe Diameter: 30 Inches
Total Estimated Footage: 6,320 Feet
Estimated Number of Manholes: 22
General Ground Cover: Grass/ Open Fields
Average Pipe Depth Range: 6-30 Feet


Four Seasons Farms Interceptor Improvement
City of Kyle Wastewater
Before Improvements
Trails Phase 1 Lift Station
Kyle Estate
330.0 Acres
1,200 LUEs
Overloaded Pipe Segments
Brookside Phase 2
36.2 Acres
220 LUEs
Villas at Creekside Phase 2
2.8 Acres
24 LUEs
Four Seasons Farms Interceptor Improvement
Connecting Lines
Surcharged Lines
Existing Wastewater Pipe Diameter (Inches)
4
6
8
10
12
15
18
21
24
27
30
Force Mains
Lift Stations
Future Developments
Reflected in Model Results
Not Reflected in Model Results
180 LUEs


After Improvements
204 LUEs
N
Trails Phase 1 Lift Station
Kyle Estate
330.0 Acres
1,200 LUEs
Improvement Project
Brookside Phase 2
36.2 Acres
220 LUEs
Villas at Creekside Phase 2
2.8 Acres
24 LUEs
Post Oak Phase 5,6 & 7
35.6 Acres
180 LUEs
B&N
BURGESS & NIPLE
Engineers ■ Planners

7.4 Center Street Village Wastewater Improvement

The Center Street Village Wastewater Improvement Project includes upsizing two (2) existing wastewater pipes from 10 inches to 18 inches, twenty five (25) wastewater pipes from 12 inches to 18 inches, and four (4) wastewater pipes from 18 inches to 21 inches. All of the developments used in the model for this scenario are listed on Table 7.4.1 along with their acreage, LUE's, average daily flow, and the wet weather peak flow. Table 7.4.2 on the following page shows the original pipe parameter values and proposed design values for each line ID in this improvement project. This improvement project is located near IH-35 adjacent to old town Kyle. These improvement recommendations are primarily driven by the addition of the proposed Blanco River Ranch, Cypress Forest, and Perry Blanton Developments. If all of the proposed developments listed above are constructed, or an equivalent number of LUE's are added to the collection system, then these improvements are required.

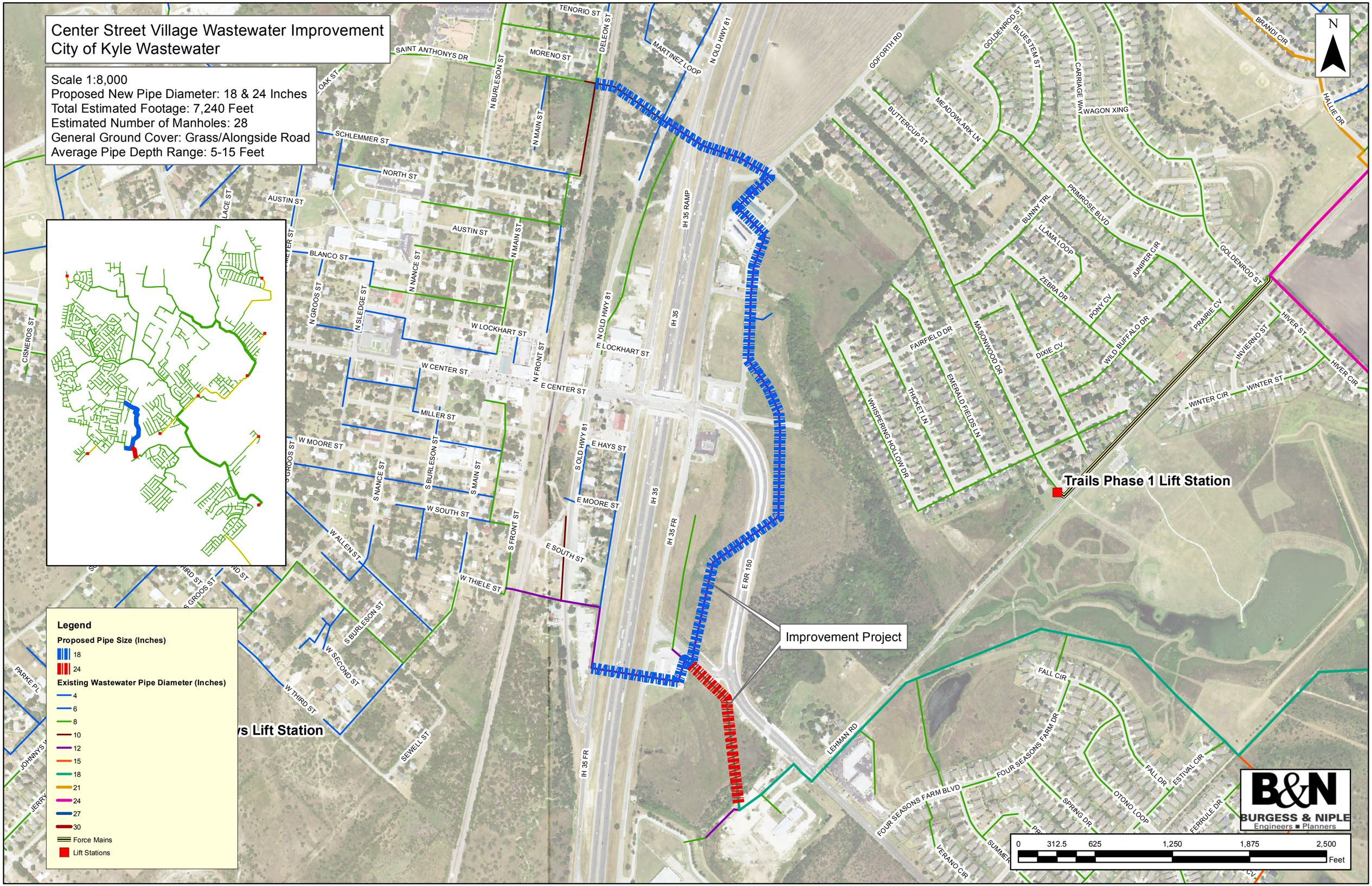
Table 7.4.1: Known Development Properties Driving Improvement Project
Center Street Village Wastewater Improvement

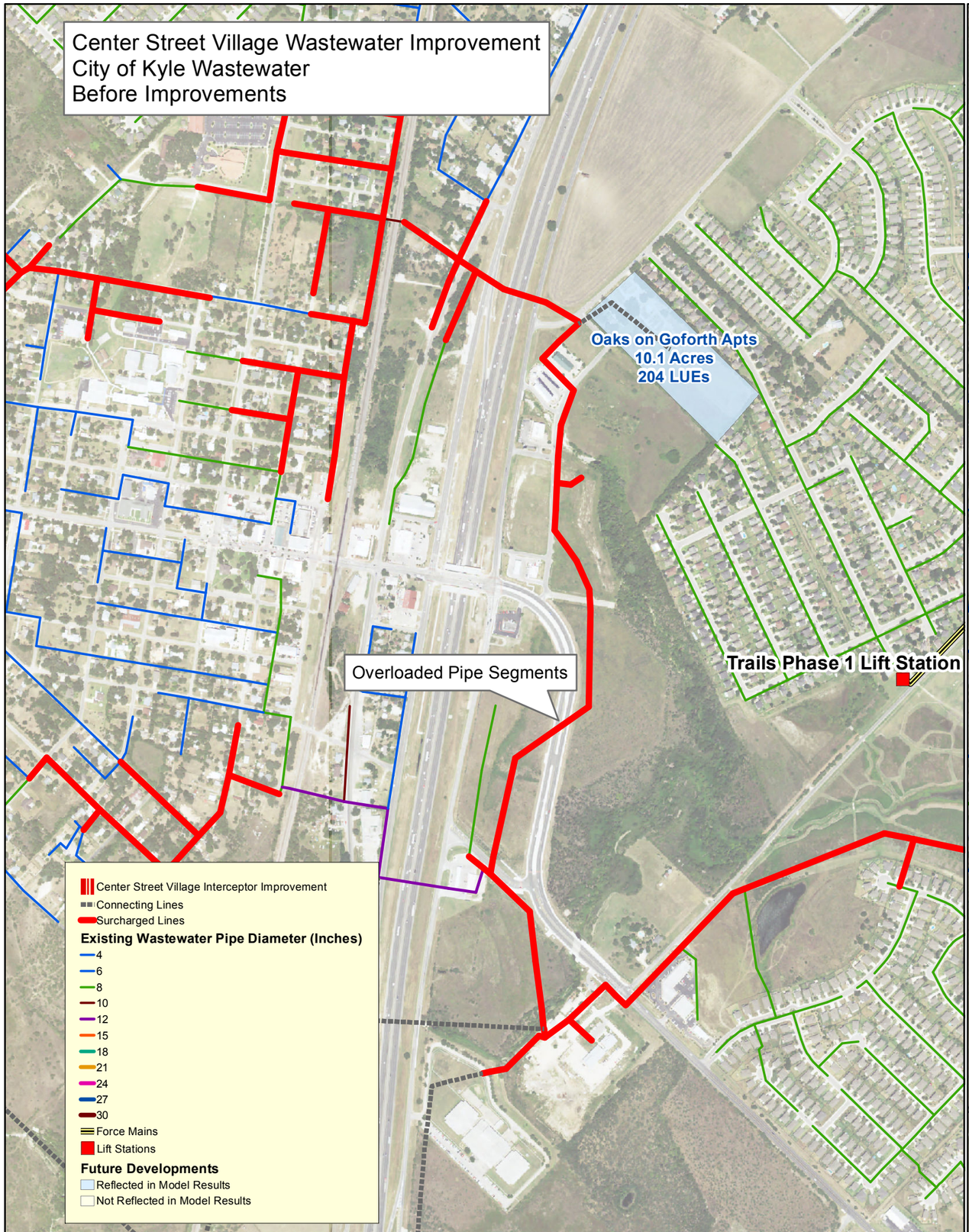
Scenario Identification	Basin Area (Acres)	Projected LUE	Dry Weather Average Daily Flow (MGD)	Wet Weather Peak Flow (MGD)
Blanco River Ranch	2,164.0	1,500	0.420	1.90
Cypress Forest	130.4	337	0.094	0.48
Oaks on Goforth Apts	10.1	204	0.057	0.29
Perry Blanton Addition	33.7	250	0.070	0.35
Total	**2,338.2**	**2,291.0**	**0.641**	**3.02**

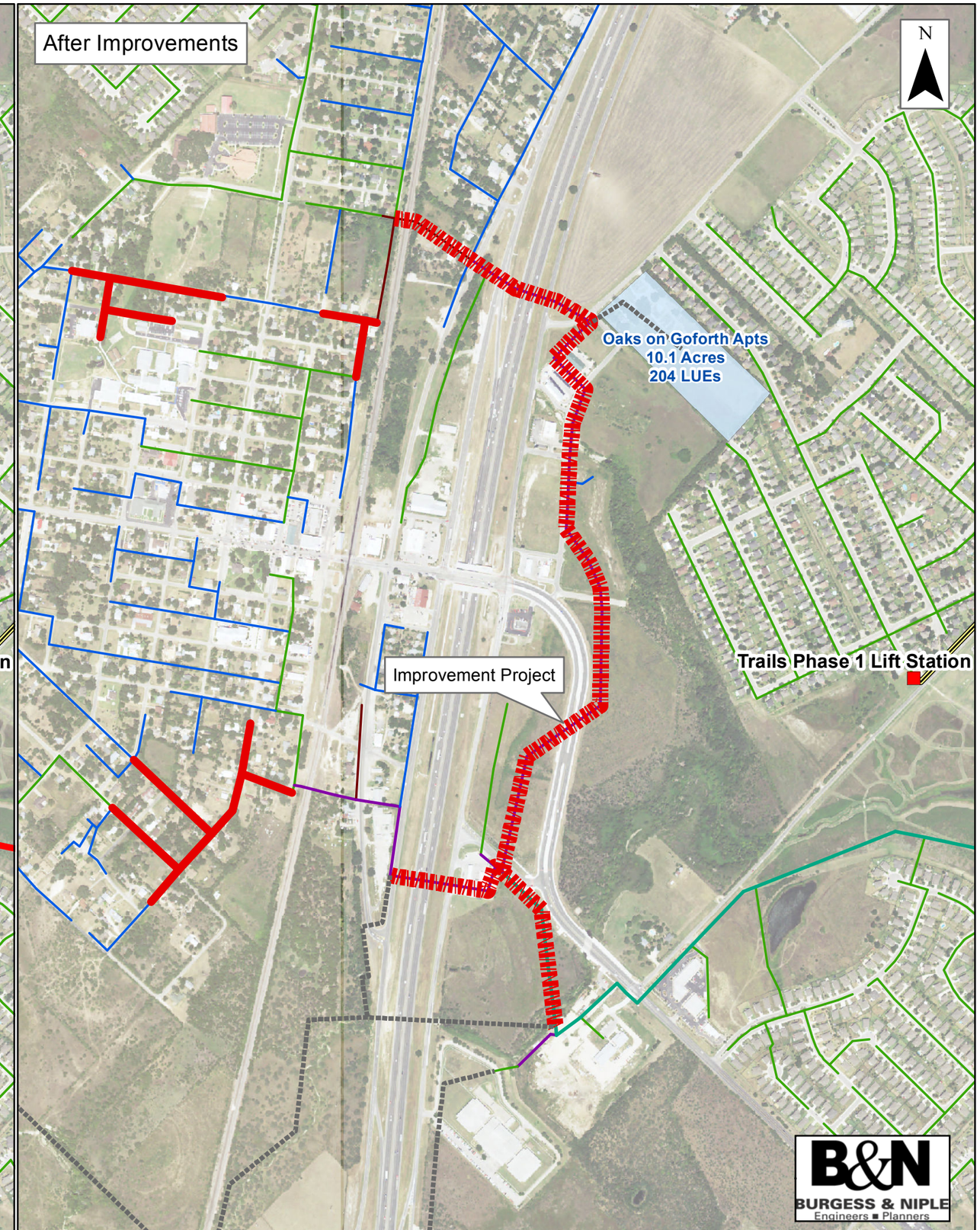
Table 7.4.2: Summary of Recommended Improvement Project Center Street Village Wastewater Improvement									
Line ID	Modified Parameter	Original Values				Proposed Values			
		Diameter	Upstream Elevation	Downstream Elevation	Slope	Diameter	Upstream Elevation	Downstream Elevation	Slope
33.1	Diameter	12	679.85	678.96	0.53%	18	679.85	678.96	0.53%
35.1	Diameter	12	678.05	676.64	0.51%	18	678.05	676.64	0.51%
36.1	Diameter	12	676.54	675.84	0.30%	18	676.54	675.84	0.30%
43.1	Diameter	12	672.60	672.12	0.25%	18	672.60	672.12	0.25%
44.1	Diameter	12	672.02	671.69	0.25%	18	672.02	671.69	0.25%
42.1	Diameter	12	672.99	672.70	0.25%	18	672.99	672.70	0.25%
40.1	Diameter	12	673.85	673.48	0.30%	18	673.85	673.48	0.30%
39.1	Diameter	12	674.46	673.95	0.30%	18	674.46	673.95	0.30%
38.1	Diameter	12	675.04	674.56	0.30%	18	675.04	674.56	0.30%
37.1	Diameter	12	675.74	675.14	0.30%	18	675.74	675.14	0.30%
41.1	Diameter	12	673.38	673.09	0.25%	18	673.38	673.09	0.25%
34.1	Diameter	12	678.86	678.15	0.50%	18	678.86	678.15	0.50%
2028.1	Diameter	18	659.90	658.55	0.40%	21	659.90	658.55	0.40%
234.1	Diameter	18	658.45	657.98	0.15%	21	658.45	657.98	0.15%
1970.1	Diameter	18	657.88	657.51	0.12%	21	657.88	657.51	0.12%
379.1	Diameter	12	684.27	682.06	0.80%	18	684.27	682.06	0.80%
378.1	Diameter	12	685.91	684.27	0.80%	18	685.91	684.27	0.80%
376.1	Diameter	12	689.53	686.01	2.66%	18	689.53	686.01	2.66%
375.1	Diameter	10	692.37	690.53	0.45%	18	692.37	690.53	0.45%
334.1	Diameter	10	695.20	693.83	1.01%	18	695.20	693.83	1.01%
2026.1	Diameter	12	680.18	679.95	1.37%	18	680.18	679.95	1.37%
2025.1	Diameter	12	682.06	680.18	0.80%	18	682.06	680.18	0.80%
45.1	Diameter	12	671.63	662.71	1.49%	18	671.63	662.71	1.49%
2031.1	Diameter	12	662.61	661.49	0.20%	18	662.61	661.49	0.20%
2030.1	Diameter	12	661.49	660.23	0.20%	18	661.49	660.23	0.20%
2029.1	Diameter	12	660.13	660.00	0.12%	18	660.13	660.00	0.12%
2188.1	Diameter	18	657.41	657.26	0.12%	21	657.41	657.26	0.12%

Center Street Village Wastewater Improvement
City of Kyle Wastewater

Scale 1:8,000
Proposed New Pipe Diameter: 18 & 24 Inches
Total Estimated Footage: 7,240 Feet
Estimated Number of Manholes: 28
General Ground Cover: Grass/Alongside Road
Average Pipe Depth Range: 5-15 Feet




Center Street Village Wastewater Improvement
City of Kyle Wastewater
Before Improvements
Oaks on Goforth Apts
10.1 Acres
204 LUEs
Overloaded Pipe Segments
Trails Phase 1 Lift Station
Center Street Village Interceptor Improvement
Connecting Lines
Surcharged Lines
Existing Wastewater Pipe Diameter (Inches)
4
6
8
10
12
15
18
21
24
27
30
Force Mains
Lift Stations
Future Developments
Reflected in Model Results
Not Reflected in Model Results


After Improvements
N
Oaks on Goforth Apts
10.1 Acres
204 LUEs
Improvement Project
Trails Phase 1 Lift Station
B&N
BURGESS & NIPLE
Engineers ■ Planners

7.5 North Trails Interceptor Improvement

The North Trails Interceptor Improvement Project includes upsizing eight (8) existing wastewater pipes from 24 inches to 36 inches. All of the developments used in the model for this scenario are listed on Table 7.5.1 along with their acreage, LUE's, average daily flow, and the wet weather peak flow. Table 7.5.2 shows the original pipe parameter values and proposed design values for each line ID on this improvement project. These improvement recommendations are driven by the addition of the Crosswinds Development, the Final Phases of the Meadows at Kyle development, Anthem, Plum Creek Final Phase, Hays Commerce Park, The Strand Apartments, Sunset Hills, Kensington Trails Final Phases, Trails at Plum Creek Apartments, Creekside Village, and Brooks Crossing. If all of the proposed developments listed above are constructed, or an equivalent number of LUE's are added to the collection system, then these improvements are required.

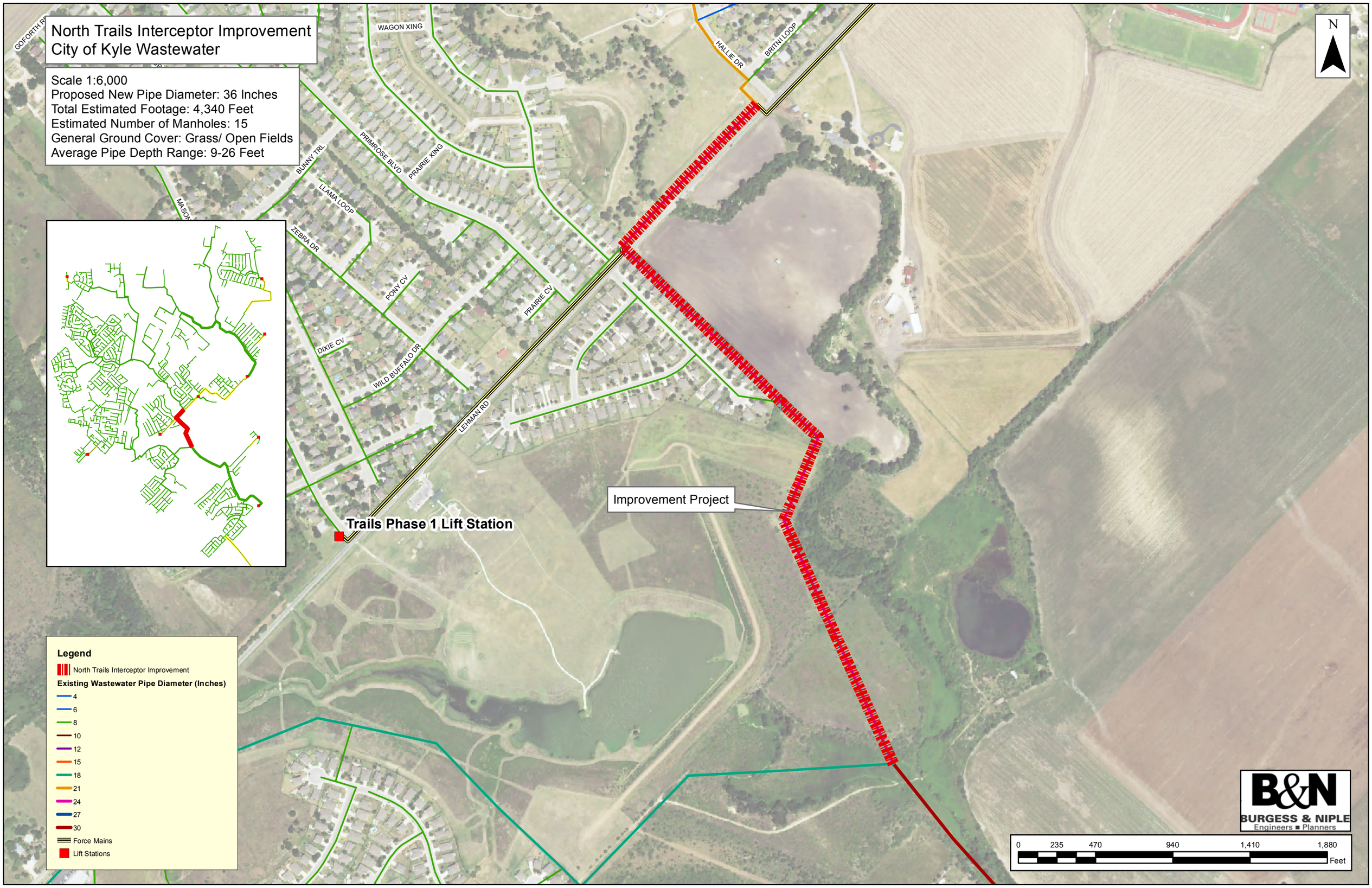
Table 7.5.1: Known Development Properties Driving Improvement
North Trails Interceptor Improvement

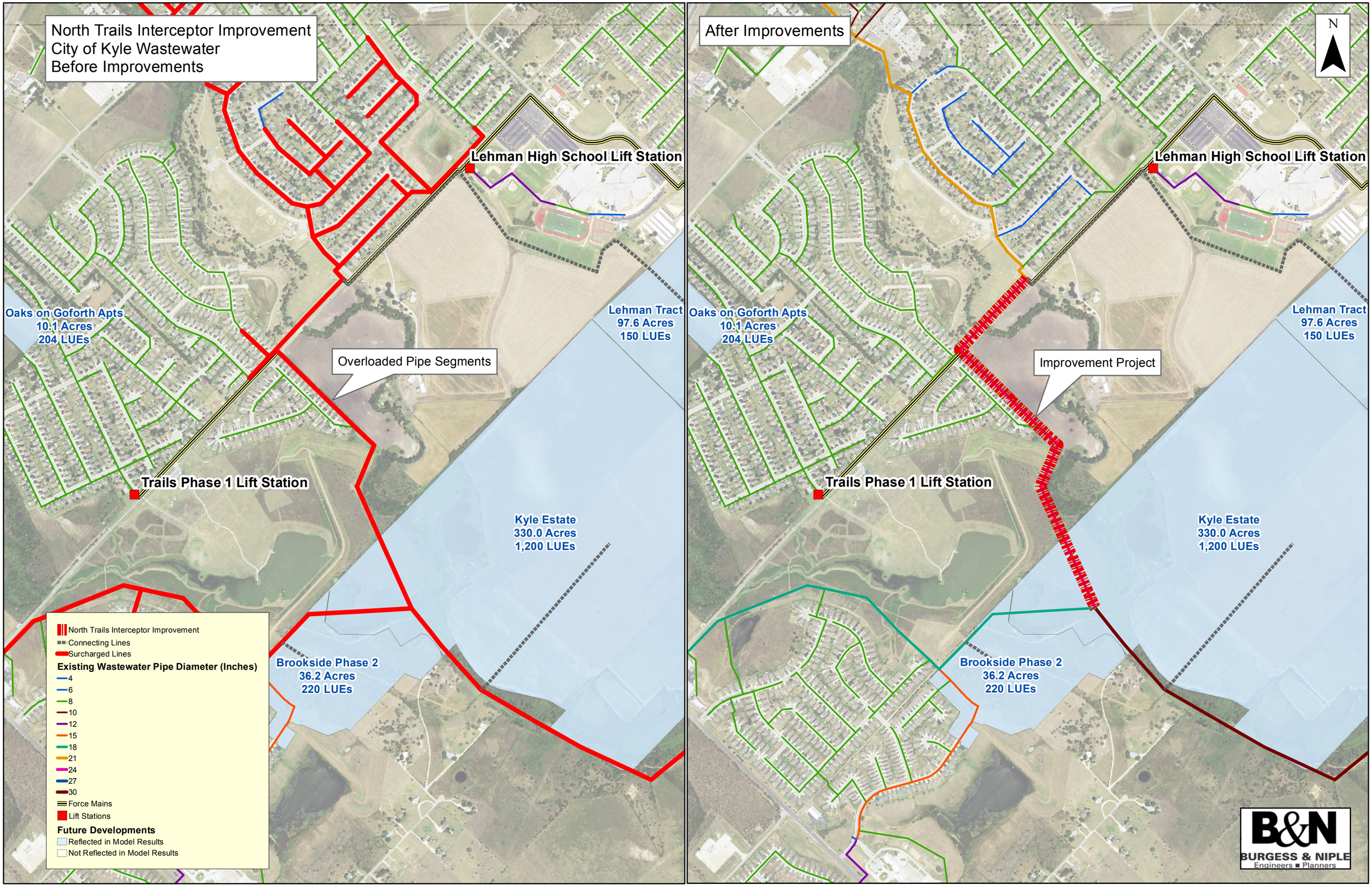
Scenario Identification	Basin Area (Acres)	Projected LUE	Dry Weather Average Daily Flow (MGD)	Wet Weather Peak Flow (MGD)
Anthem	672.0	1,500	0.420	2.10
Brooks Crossing	47.8	123	0.034	0.13
Creekside Village	73.2	280	0.078	0.31
Crosswinds MUD	443.6	1,750	0.490	1.80
Hays Commerce Park	105.9	24	0.007	0.03
Kensington Trails remaining phases	33.7	110	0.031	0.16
Lehman Tract	97.6	150	0.042	0.18
Meadows at Kyle Phases 4,5,6	51.4	350	0.098	0.24
Plum Creek	606.5	1,500	0.420	1.90
Sunset Hills	53.2	177	0.050	0.14
The Strand Apartments	7.6	160	0.045	0.23
Trails at Plum Creek Apts	12.3	248	0.069	0.14
Vista at Plum Creek Apts Phase 2	7.4	180	0.050	0.25
Total	**2,212.2**	**6,552.0**	**1.835**	**7.60**

Table 7.5.2: Summary of Recommended Improvements North Trails Interceptor Improvement									
Line ID	Modified Parameter	Original Values				Proposed Values			
		Diameter	Upstream Elevation	Downstream Elevation	Slope	Diameter	Upstream Elevation	Downstream Elevation	Slope
840.1	Diameter	24	636.26	633.79	0.34%	36	636.26	633.79	0.34%
1929.1	Diameter	24	646.07	644.15	0.35%	36	646.07	644.15	0.35%
1928.1	Diameter	24	638.15	636.26	0.39%	36	638.15	636.26	0.39%
1985.1	Diameter	24	629.65	627.30	0.35%	36	629.65	627.30	0.35%
1986.1	Diameter	24	619.03	616.34	0.37%	36	619.03	616.34	0.37%
854.1	Diameter	24	631.31	631.31	0.00%	36	631.31	631.31	0.00%
1984.1	Diameter	24	631.31	629.75	0.33%	36	631.31	629.75	0.33%
2275.1	Diameter	24	633.79	632.26	0.35%	36	633.79	632.26	0.35%

North Trails Interceptor Improvement
City of Kyle Wastewater

Scale 1:6,000
Proposed New Pipe Diameter: 36 Inches
Total Estimated Footage: 4,340 Feet
Estimated Number of Manholes: 15
General Ground Cover: Grass/ Open Fields
Average Pipe Depth Range: 9-26 Feet




North Trails Interceptor Improvement
City of Kyle Wastewater
Before Improvements
Lehman High School Lift Station
Oaks on Goforth Apts
10.1 Acres
204 LUEs
Lehman Tract
97.6 Acres
150 LUEs
Overloaded Pipe Segments
Trails Phase 1 Lift Station
Kyle Estate
330.0 Acres
1,200 LUEs
Brookside Phase 2
36.2 Acres
220 LUEs
North Trails Interceptor Improvement
Connecting Lines
Surcharged Lines
Existing Wastewater Pipe Diameter (Inches)
4
6
8
10
12
15
18
21
24
27
30
Force Mains
Lift Stations
Future Developments
Reflected in Model Results
Not Reflected in Model Results
After Improvements
N
Lehman High School Lift Station
Oaks on Goforth Apts
10.1 Acres
204 LUEs
Lehman Tract
97.6 Acres
150 LUEs
Improvement Project
Trails Phase 1 Lift Station
Kyle Estate
330.0 Acres
1,200 LUEs
Brookside Phase 2
36.2 Acres
220 LUEs
B&N
BURGESS & NIPLE
Engineers ■ Planners

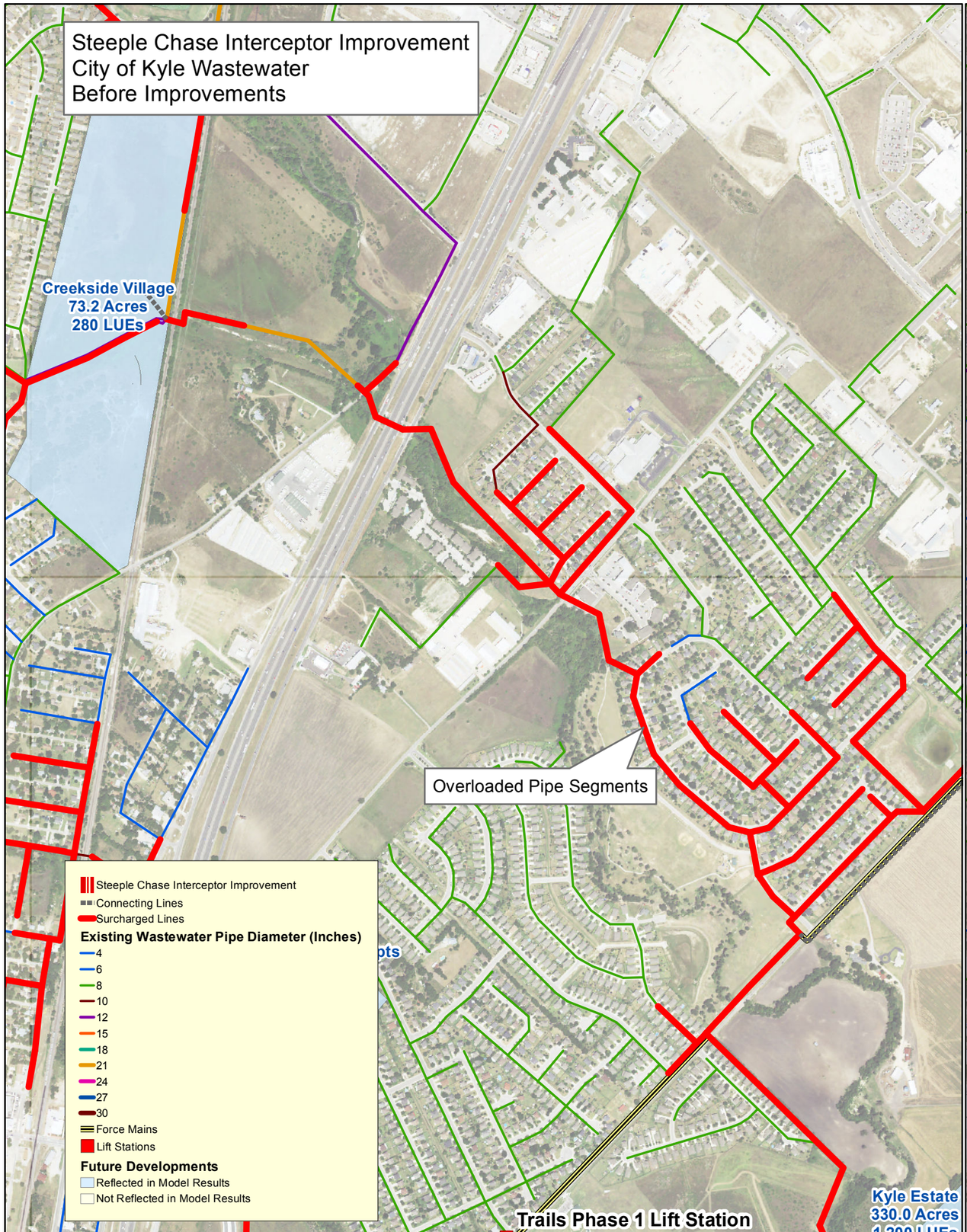
7.6 Steeplechase Interceptor Improvement

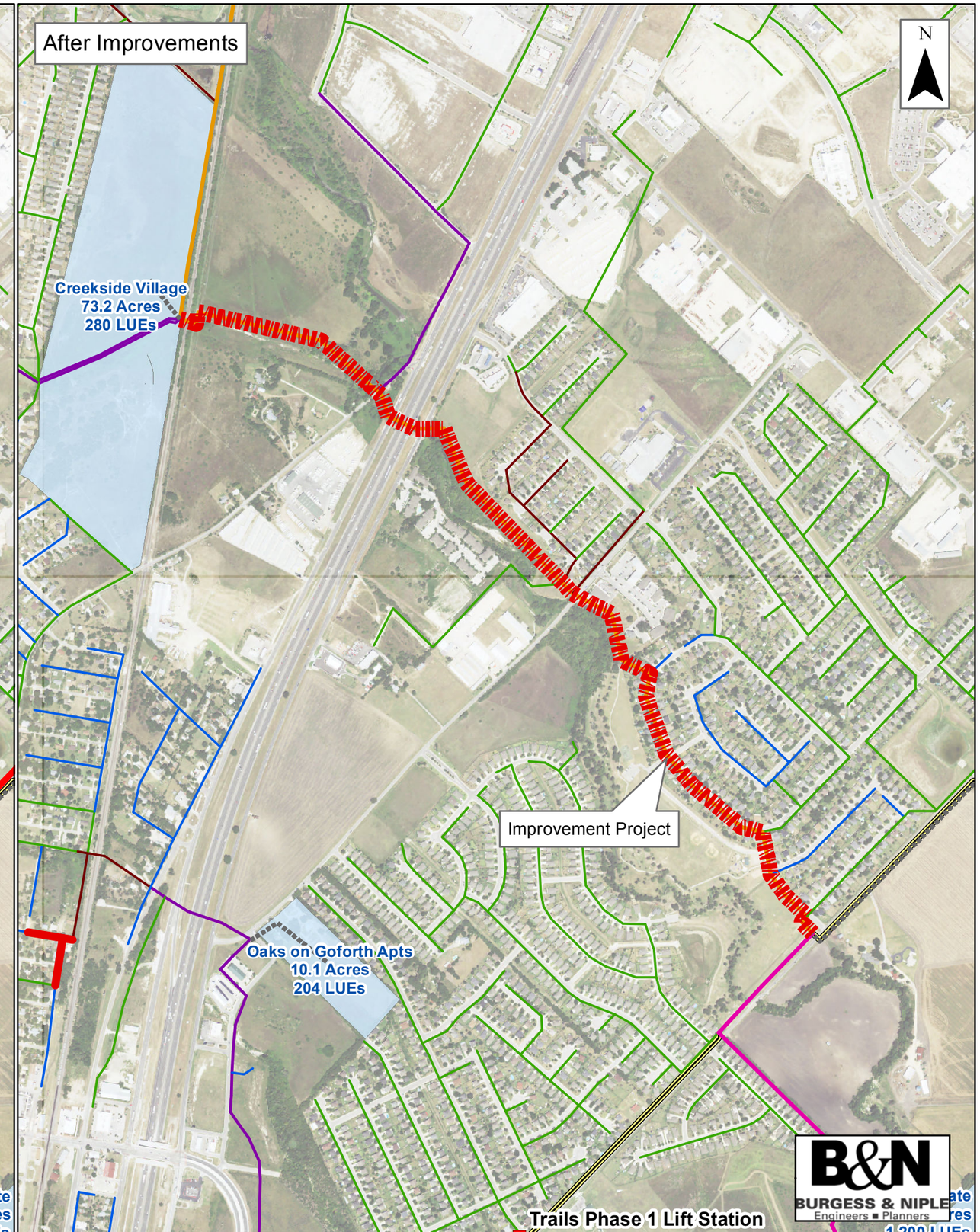
The Steeplechase Interceptor Improvement Project includes upsizing twenty-nine (29) existing wastewater pipes from 21 inches to 30 inches. All of the developments used in the model for this scenario are listed on Table 7.6.1 along with their acreage, LUE's, average daily flow, and the wet weather peak flow. Table 7.6.2 shows the original pipe parameter values and proposed design values for each line ID for this improvement project. These improvement recommendations are primarily driven by the addition of the Anthem development and the Final Phases of the Plum Creek Development. Other developments that also increase the flow through this line include, The Trails at Plum Creek Apartments, Vista at Plum Creek Apartments Phase 2, and parts of the Creekside Village Development, Brooks Crossing Development and the Creekside Village Development. If all of the proposed developments examined in this report are constructed, or an equivalent number of LUE's are added to the collection system, then these improvements are required.

Table 7.6.1: Known Development Properties Driving Improvement
Steeplechase Interceptor Improvement

Scenario Identification	Basin Area (Acres)	Projected LUE	Dry Weather Average Daily Flow (MGD)	Wet Weather Peak Flow (MGD)
Anthem	672.0	1,500	0.420	2.10
Brooks Crossing	47.8	123	0.034	0.13
Creekside Village	73.2	280	0.078	0.31
Plum Creek	606.5	1,500	0.420	1.90
Trails at Plum Creek Apts	12.3	248	0.069	0.14
Vista at Plum Creek Apts Phase 2	7.4	180	0.050	0.25
Total	**1,419.2**	**3,831.0**	**1.073**	**4.83**

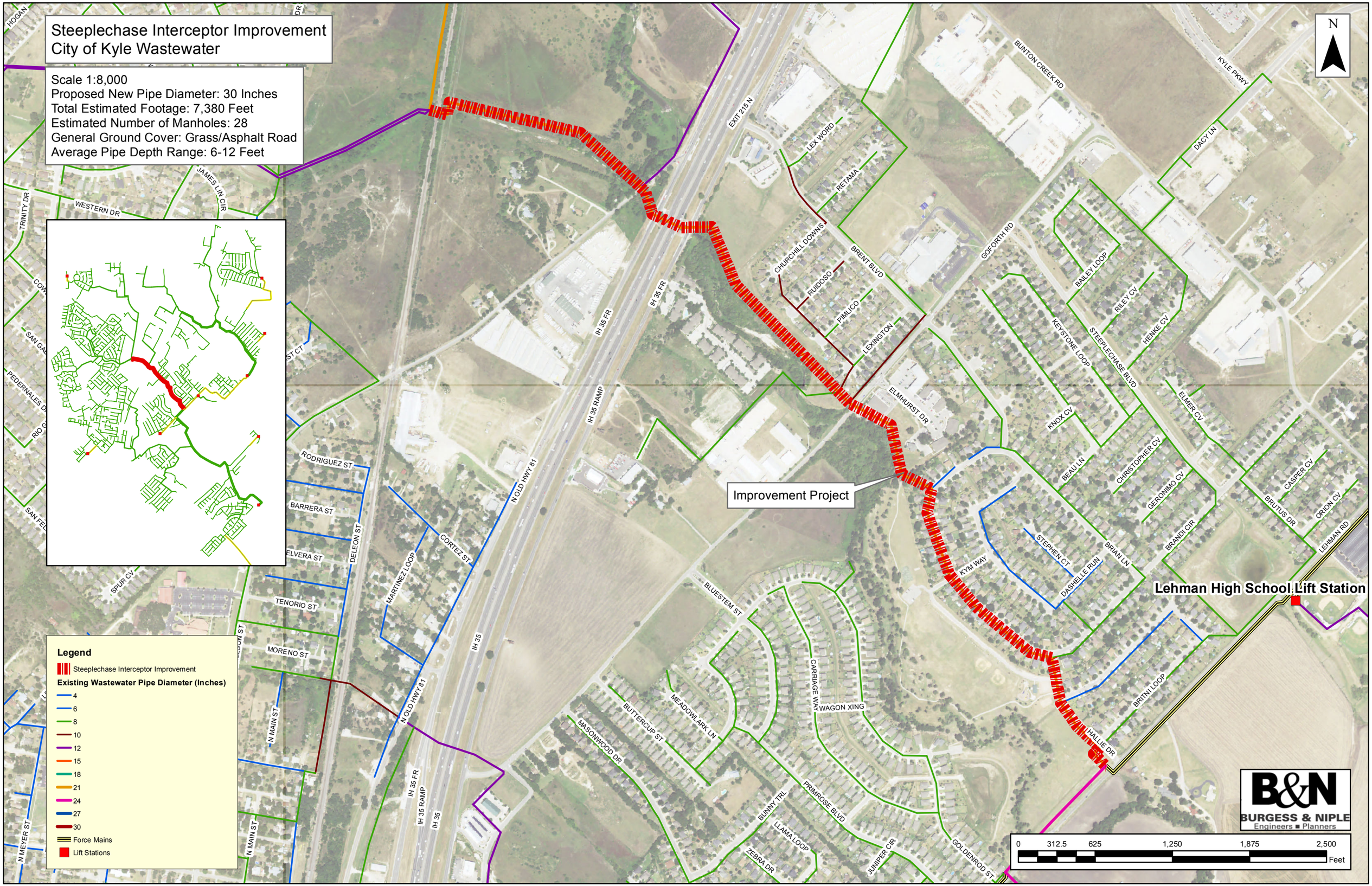
Table 7.6.2: Summary of Recommended Improvements Steeplechase Interceptor Improvement									
Line ID	Modified Parameter	Original Values				Proposed Values			
		Diameter	Upstream Elevation	Downstream Elevation	Slope	Diameter	Upstream Elevation	Downstream Elevation	Slope
417.1	Diameter	21	646.15	646.07	0.04%	30	646.15	646.07	0.04%
418.1	Diameter	21	648.71	646.77	0.88%	30	648.71	646.77	0.88%
419.1	Diameter	21	649.70	648.81	0.45%	30	649.70	648.81	0.45%
428.1	Diameter	21	657.29	650.70	3.72%	30	657.29	650.70	3.72%
2076.1	Diameter	21	672.85	669.59	0.65%	30	672.85	669.59	0.65%
453.1	Diameter	21	666.79	666.47	0.10%	30	666.79	666.47	0.10%
433.1	Diameter	21	661.23	660.37	0.50%	30	661.23	660.37	0.50%
432.1	Diameter	21	660.27	657.87	0.52%	30	660.27	657.87	0.52%
431.1	Diameter	21	657.77	656.17	0.53%	30	657.77	656.17	0.53%
430.1	Diameter	21	656.17	653.73	0.50%	30	656.17	653.73	0.50%
429.1	Diameter	21	653.63	652.39	0.78%	30	653.63	652.39	0.78%
938.1	Diameter	21	668.45	666.89	1.51%	30	668.45	666.89	1.51%
2158.1	Diameter	21	693.28	692.20	0.85%	30	693.28	692.20	0.85%
2070.1	Diameter	21	685.20	681.40	0.76%	30	685.20	681.40	0.76%
2068.1	Diameter	21	692.10	692.02	0.09%	30	692.10	692.02	0.09%
2067.1	Diameter	21	691.92	691.00	0.20%	30	691.92	691.00	0.20%
2069.1	Diameter	21	690.90	685.30	1.14%	30	690.90	685.30	1.14%
2081.1	Diameter	21	681.40	680.00	2.05%	30	681.40	680.00	2.05%
1559.1	Diameter	21	678.43	678.00	0.91%	30	678.43	678.00	0.91%
2071.1	Diameter	21	677.90	677.00	0.56%	30	677.90	677.00	0.56%
2072.1	Diameter	21	676.90	675.08	0.81%	30	676.90	675.08	0.81%
2073.1	Diameter	21	674.98	674.78	0.09%	30	674.98	674.78	0.09%
2074.1	Diameter	21	674.68	674.27	0.09%	30	674.68	674.27	0.09%
2075.1	Diameter	21	674.17	672.95	0.78%	30	674.17	672.95	0.78%
2077.1	Diameter	21	669.49	668.45	0.27%	30	669.49	668.45	0.27%
2078.1	Diameter	21	666.37	665.83	0.15%	30	666.37	665.83	0.15%
2080.1	Diameter	21	665.56	661.23	2.29%	30	665.56	661.23	2.29%
2079.1	Diameter	21	665.73	665.66	0.16%	30	665.73	665.66	0.16%
2363.1	Diameter	21	650.81	650.70	0.08%	30	650.81	650.70	0.08%


Steeple Chase Interceptor Improvement
City of Kyle Wastewater
Before Improvements
Creekside Village
73.2 Acres
280 LUEs
Overloaded Pipe Segments
Steeple Chase Interceptor Improvement
Connecting Lines
Surcharged Lines
Existing Wastewater Pipe Diameter (Inches)
4
6
8
10
12
15
18
21
24
27
30
Force Mains
Lift Stations
Future Developments
Reflected in Model Results
Not Reflected in Model Results
Trails Phase 1 Lift Station
Kyle Estate
330.0 Acres
1,200 LUEs


After Improvements
N
Creekside Village
73.2 Acres
280 LUEs
Improvement Project
Oaks on Goforth Apts
10.1 Acres
204 LUEs
Trails Phase 1 Lift Station
1,200 LUEs
B&N
BURGESS & NIPLE
Engineers ■ Planners

Steeplechase Interceptor Improvement
City of Kyle Wastewater

Scale 1:8,000
Proposed New Pipe Diameter: 30 Inches
Total Estimated Footage: 7,380 Feet
Estimated Number of Manholes: 28
General Ground Cover: Grass/Asphalt Road
Average Pipe Depth Range: 6-12 Feet



7.7 Plum Creek Interceptor Improvement Phase 1

The Plum Creek Interceptor improvement Phase 1 Project includes upsizing seventeen (17) existing wastewater pipes from 12 to 18 inches. All of the developments used in the model for this scenario are listed in Table 7.7.1 along with their acreage, LUE's, average daily flow, and the wet weather peak flow. Table 7.7.2 shows the original pipe and proposed design values for each line ID in this improvement project. This project runs east along a drainage easement from the proposed Brooks Crossing development to the main interceptor and the recommendations are driven by the addition of the Brooks Crossing and the Creekside Village developments. If all of the developments listed are constructed, or an equivalent number of LUE's are added to the collection system, then these improvements are required.

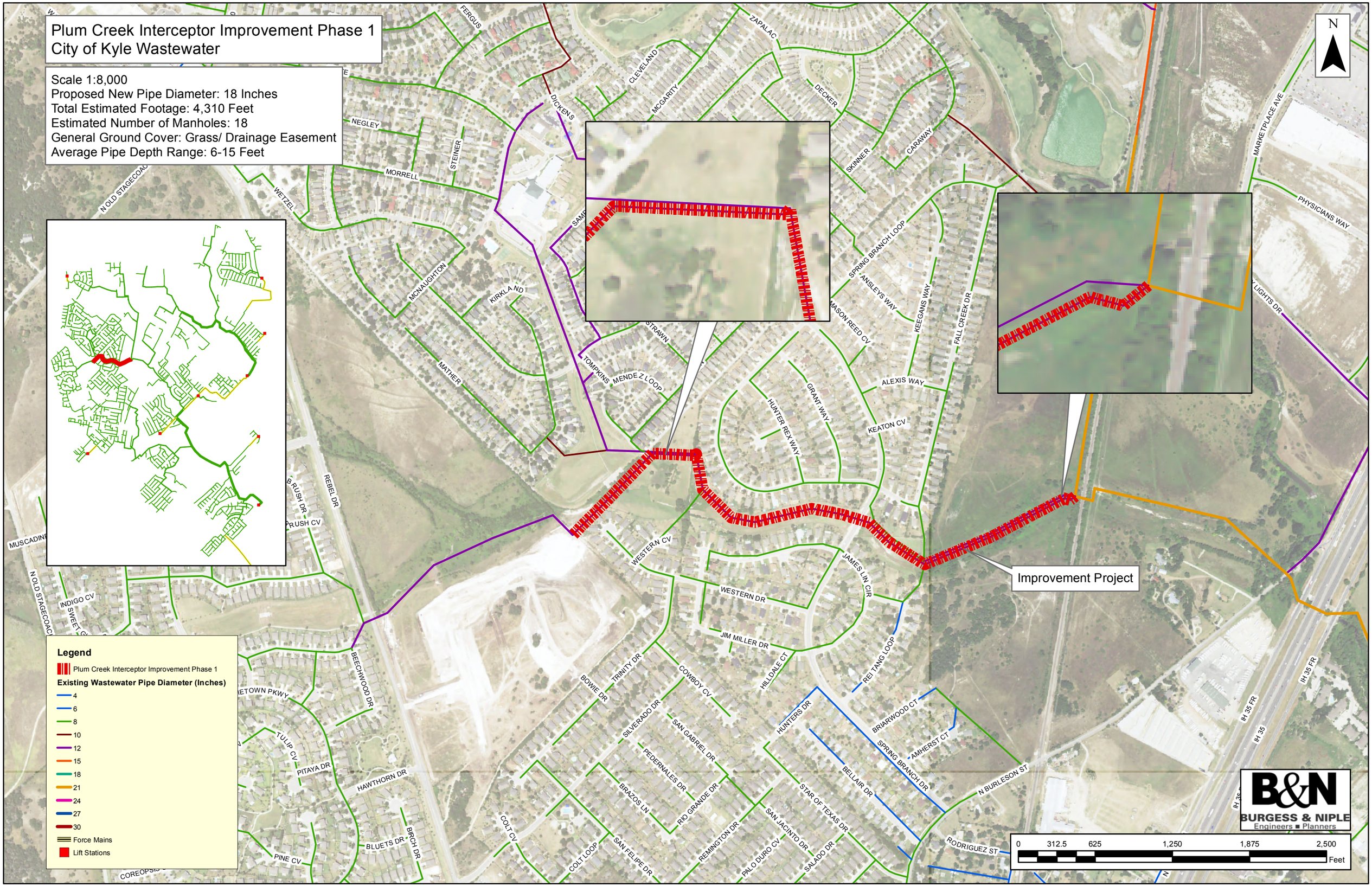
Table 7.7.1: Known Development Properties Driving Improvement
Plum Creek Interceptor Improvement Phase 1

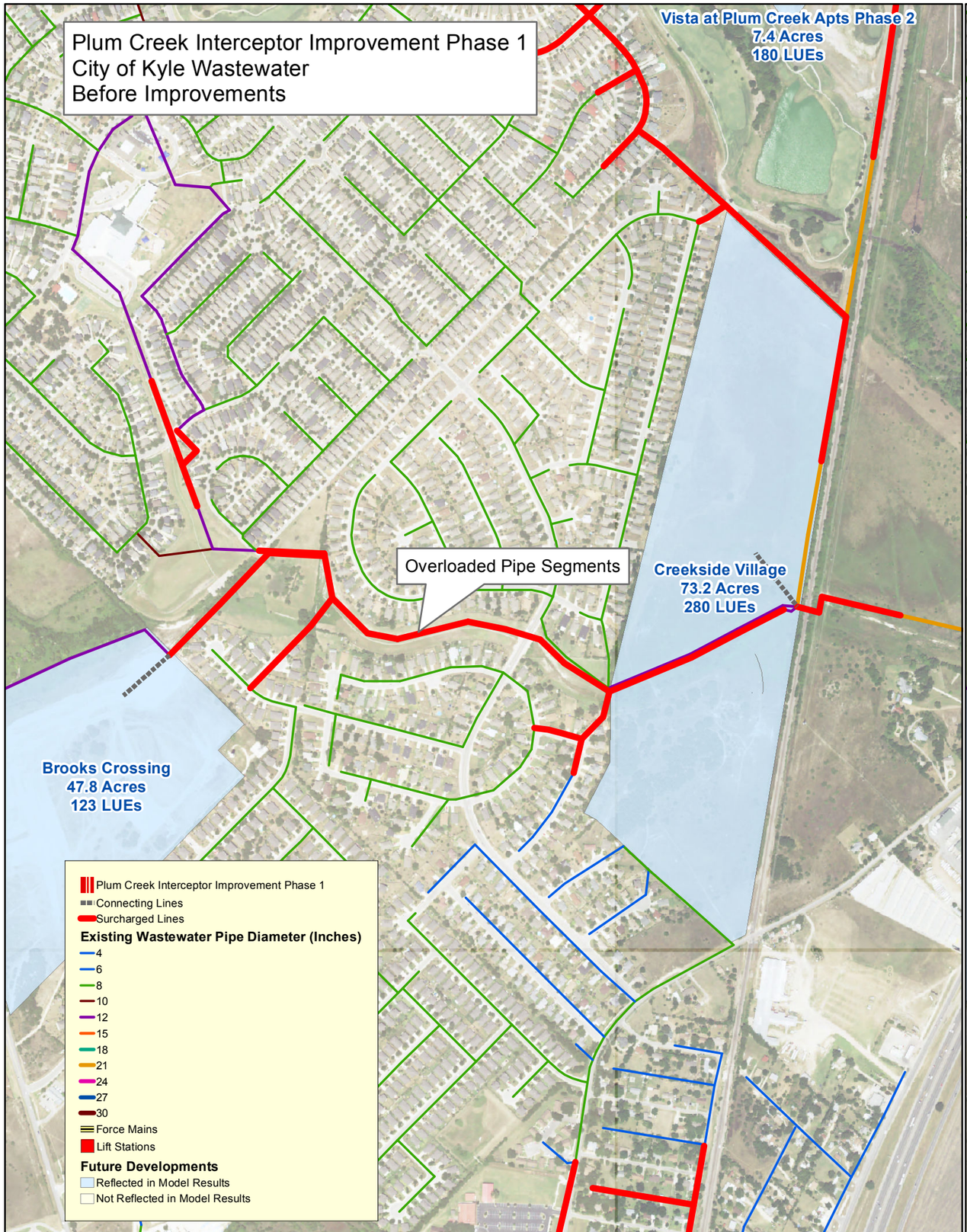
Scenario Identification	Basin Area (Acres)	Projected LUE	Dry Weather Average Daily Flow (MGD)	Wet Weather Peak Flow (MGD)
Brooks Crossing	47.8	123	0.034	0.13
Creekside Village	73.2	280	0.078	0.31
Total	**121.0**	**403.0**	**0.113**	**0.44**

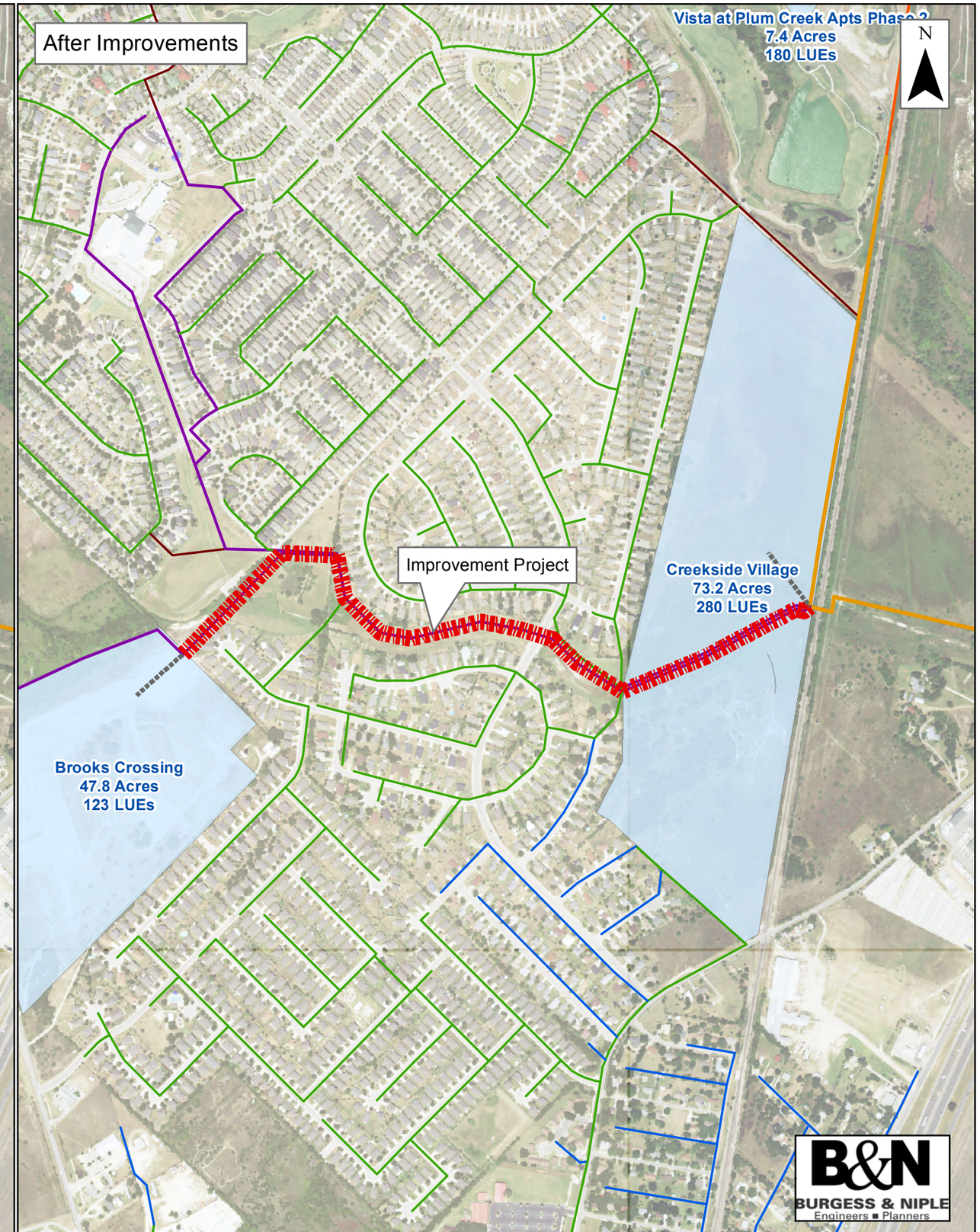
Table 7.7.2: Summary of Recommended Improvements Plum Creek Interceptor Improvement Phase 1									
Line ID	Modified Parameter	Original Values				Proposed Values			
		Diameter	Upstream Elevation	Downstream Elevation	Slope	Diameter	Upstream Elevation	Downstream Elevation	Slope
2065.1	Diameter	12	696.94	695.26	0.59%	18	696.94	695.26	0.59%
1129.1	Diameter	12	727.76	723.75	1.00%	18	727.76	723.75	1.00%
1135.1	Diameter	12	723.65	719.74	0.98%	18	723.65	719.74	0.98%
1134.1	Diameter	12	719.64	716.42	1.06%	18	719.64	716.42	1.06%
1133.1	Diameter	12	716.32	716.00	2.43%	18	716.32	716.00	2.43%
2063.1	Diameter	12	714.67	713.60	0.42%	18	714.67	713.60	0.42%
1143.1	Diameter	12	713.50	712.66	0.30%	18	713.50	712.66	0.30%
1144.1	Diameter	12	712.56	711.11	0.85%	18	712.56	711.11	0.85%
1145.1	Diameter	12	711.01	707.90	0.76%	18	711.01	707.90	0.76%
1146.1	Diameter	12	707.80	706.58	0.57%	18	707.80	706.58	0.57%
1147.1	Diameter	12	706.48	705.60	0.44%	18	706.48	705.60	0.44%
1148.1	Diameter	12	705.50	704.59	0.48%	18	705.50	704.59	0.48%
1149.1	Diameter	12	704.49	701.99	0.83%	18	704.49	701.99	0.83%
2437.1	Diameter	12	701.89	698.92	0.59%	18	701.89	698.92	0.59%
2064.1	Diameter	12	698.82	697.04	0.60%	18	698.82	697.04	0.60%
2066.1	Diameter	12	695.16	694.73	0.95%	18	695.16	694.73	0.95%
1021.1	Diameter	12	694.63	694.13	1.19%	18	694.63	694.13	1.19%

Plum Creek Interceptor Improvement Phase 1
City of Kyle Wastewater

Scale 1:8,000
Proposed New Pipe Diameter: 18 Inches
Total Estimated Footage: 4,310 Feet
Estimated Number of Manholes: 18
General Ground Cover: Grass/ Drainage Easement
Average Pipe Depth Range: 6-15 Feet




Plum Creek Interceptor Improvement Phase 1
City of Kyle Wastewater
Before Improvements
Vista at Plum Creek Apts Phase 2
7.4 Acres
180 LUEs
Overloaded Pipe Segments
Creekside Village
73.2 Acres
280 LUEs
Brooks Crossing
47.8 Acres
123 LUEs
Plum Creek Interceptor Improvement Phase 1
Connecting Lines
Surcharged Lines
Existing Wastewater Pipe Diameter (Inches)
4
6
8
10
12
15
18
21
24
27
30
Force Mains
Lift Stations
Future Developments
Reflected in Model Results
Not Reflected in Model Results


After Improvements
Vista at Plum Creek Apts Phase 2
7.4 Acres
180 LUEs
N
Improvement Project
Creekside Village
73.2 Acres
280 LUEs
Brooks Crossing
47.8 Acres
123 LUEs
B&N
BURGESS & NIPLE
Engineers ■ Planners

7.8 Plum Creek Interceptor Improvement Phase 2

The Plum Creek Interceptor Improvement Phase 2 Project includes upsizing eight (8) existing wastewater pipes from 21 to 24 inches. All of the developments used in the model for this scenario are listed on Table 7.8.1 with their acreage, LUE's, average daily flow, and the wet weather peak flow. Table 7.8.2 shows the original pipe and proposed design values for each line ID In this improvement project. This project runs along the east side of the railroad track near the existing Plum Creek subdivision. These recommendations are driven by the addition of the Anthem and the Final Phases of the Plum Creek Developments. Other developments that influence the need to upsize these lines include the Trails at Plum Creek Apartments, Vista at Plum Creek Apartments Phase 2, and portions of the Creekside Village Development; if all of the developments listed are constructed, or an equivalent number of LUE's are added to the collection system, then these improvements are required.

Table 7.8.1: Known Development Properties Driving Improvement
Plum Creek Interceptor Improvement Phase 2

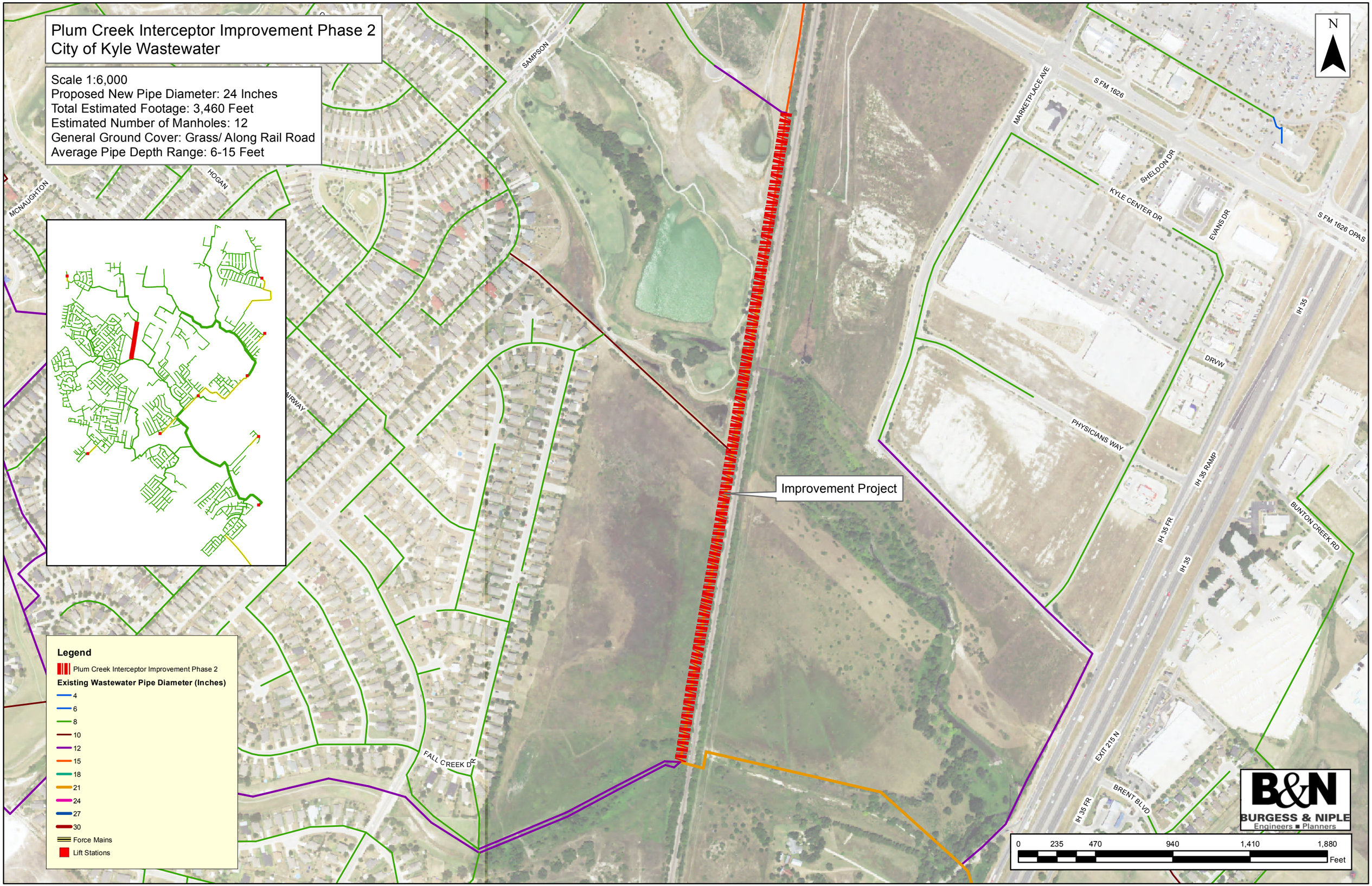
Scenario Identification	Basin Area (Acres)	Projected LUE	Dry Weather Average Daily Flow (MGD)	Wet Weather Peak Flow (MGD)
Anthem	672.0	1,500	0.420	2.10
Creekside Village	73.2	280	0.078	0.31
Plum Creek	606.5	1,500	0.420	1.90
Trails at Plum Creek Apts	12.3	248	0.069	0.14
Vista at Plum Creek Apts Phase 2	7.4	180	0.050	0.25
Total	**1,371.4**	**3,708.0**	**1.038**	**4.70**

Table 7.8.2: Summary of Recommended Improvements
Plum Creek Interceptor Improvement Phase 2

Line ID	Modified Parameter	Original Values				Proposed Values			
		Diameter	Upstream Elevation	Downstream Elevation	Slope	Diameter	Upstream Elevation	Downstream Elevation	Slope
2141.1	Diameter	21	700.28	699.74	0.11%	24	700.28	699.74	0.11%
2140.1	Diameter	21	699.64	699.04	0.12%	24	699.64	699.04	0.12%
1017.1	Diameter	21	697.90	697.19	0.17%	24	697.90	697.19	0.17%
1018.1	Diameter	21	697.09	696.09	0.24%	24	697.09	696.09	0.24%
1019.1	Diameter	21	695.99	695.00	0.24%	24	695.99	695.00	0.24%
1020.1	Diameter	21	694.90	693.90	0.24%	24	694.90	693.90	0.24%
2017.1	Diameter	21	700.75	700.38	0.09%	24	700.75	700.38	0.09%
2139.1	Diameter	21	699.00	698.00	0.24%	24	699.00	698.00	0.24%

Plum Creek Interceptor Improvement Phase 2
City of Kyle Wastewater

Scale 1:6,000
Proposed New Pipe Diameter: 24 Inches
Total Estimated Footage: 3,460 Feet
Estimated Number of Manholes: 12
General Ground Cover: Grass/ Along Rail Road
Average Pipe Depth Range: 6-15 Feet



Plum Creek Interceptor Improvement Phase 2
City of Kyle Wastewater
Before Improvements

Vista at Plum Creek Apts Phase 2
7.4 Acres
180 LUEs

Overloaded Pipe Segments

Plum Creek Interceptor Improvement Phase 2
Connecting Lines
Surcharged Lines

Existing Wastewater Pipe Diameter (Inches)

- 4
- 6
- 8
- 10
- 12
- 15
- 18
- 21
- 24
- 27
- 30

Force Mains
Lift Stations

Future Developments

Reflected in Model Results
Not Reflected in Model Results

After Improvements

N

Vista at Plum Creek Apts Phase 2
7.4 Acres
180 LUEs

Improvement Project

Creekside Village
73.2 Acres
280 LUEs

B&N
BURGESS & NIPLE
Engineers ■ Planners

7.9 Plum Creek Interceptor Improvement Phase 3

The Plum Creek Interceptor Improvement Phase 3 Project includes upsizing twenty four (24) existing wastewater pipes from 10 and 15 inches to 21 inches. All of the developments used in the model for this scenario are listed on Table 7.9.1 along with their acreage, LUE's, average daily flow, and the wet weather peak flow. Table 7.9.2 shows the original pipe parameter values and proposed design values for each line ID in this improvement project. These improvement recommendations are driven by the addition of the Anthem Development and the Final Phases of the Plum Creek Development. If all of the proposed developments listed above are constructed, or an equivalent number of LUE's are added to the collection system, then these improvements are required. These recommendations are assuming that the Anthem and Plum Creek final phase developments will tie its wastewater lines into the existing system at Kohlers Crossing adjacent to Kirby Lane at manhole 169.

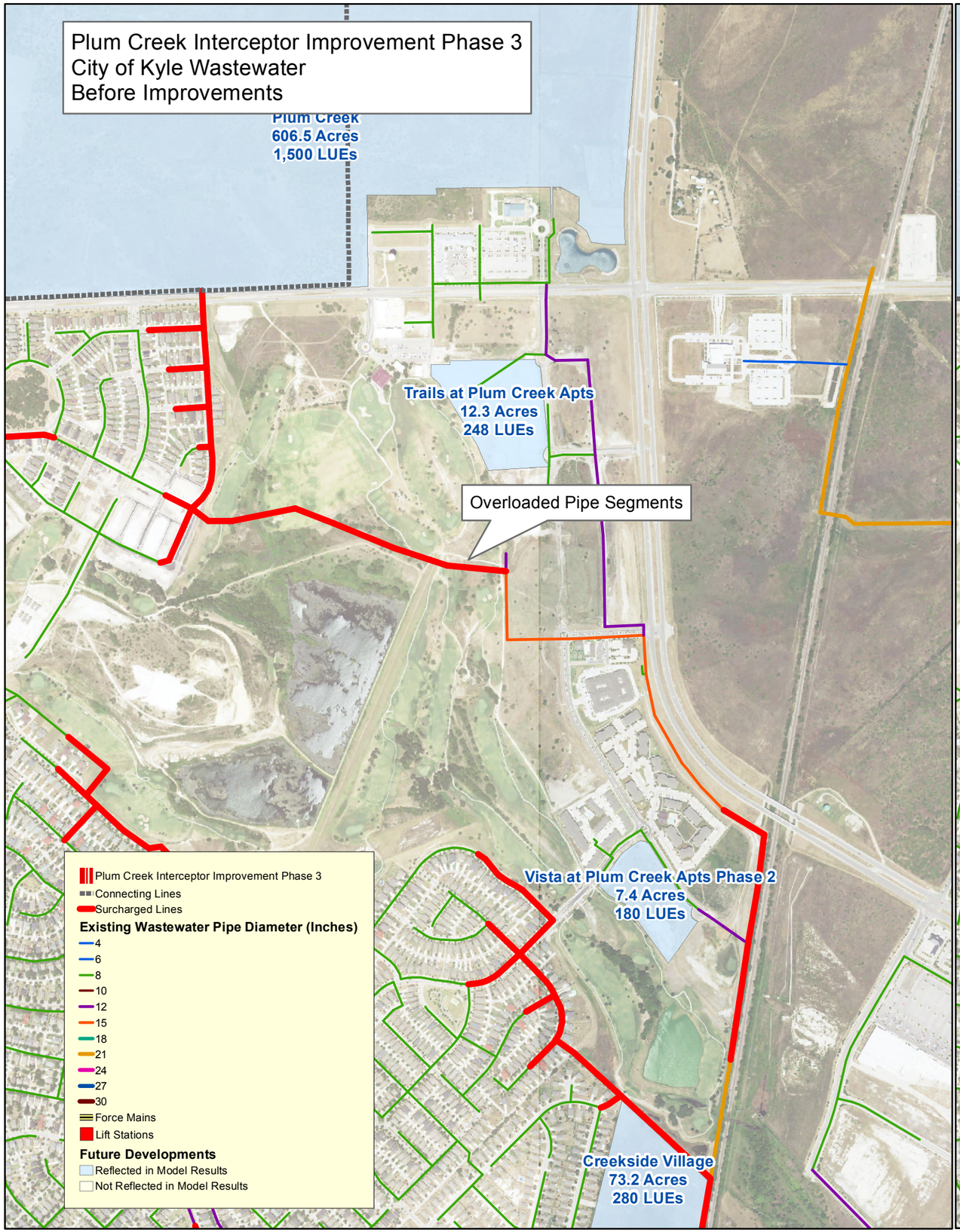
Table 7.9.1: Known Development Properties Driving Improvement
Plum Creek Interceptor Improvement Phase 3

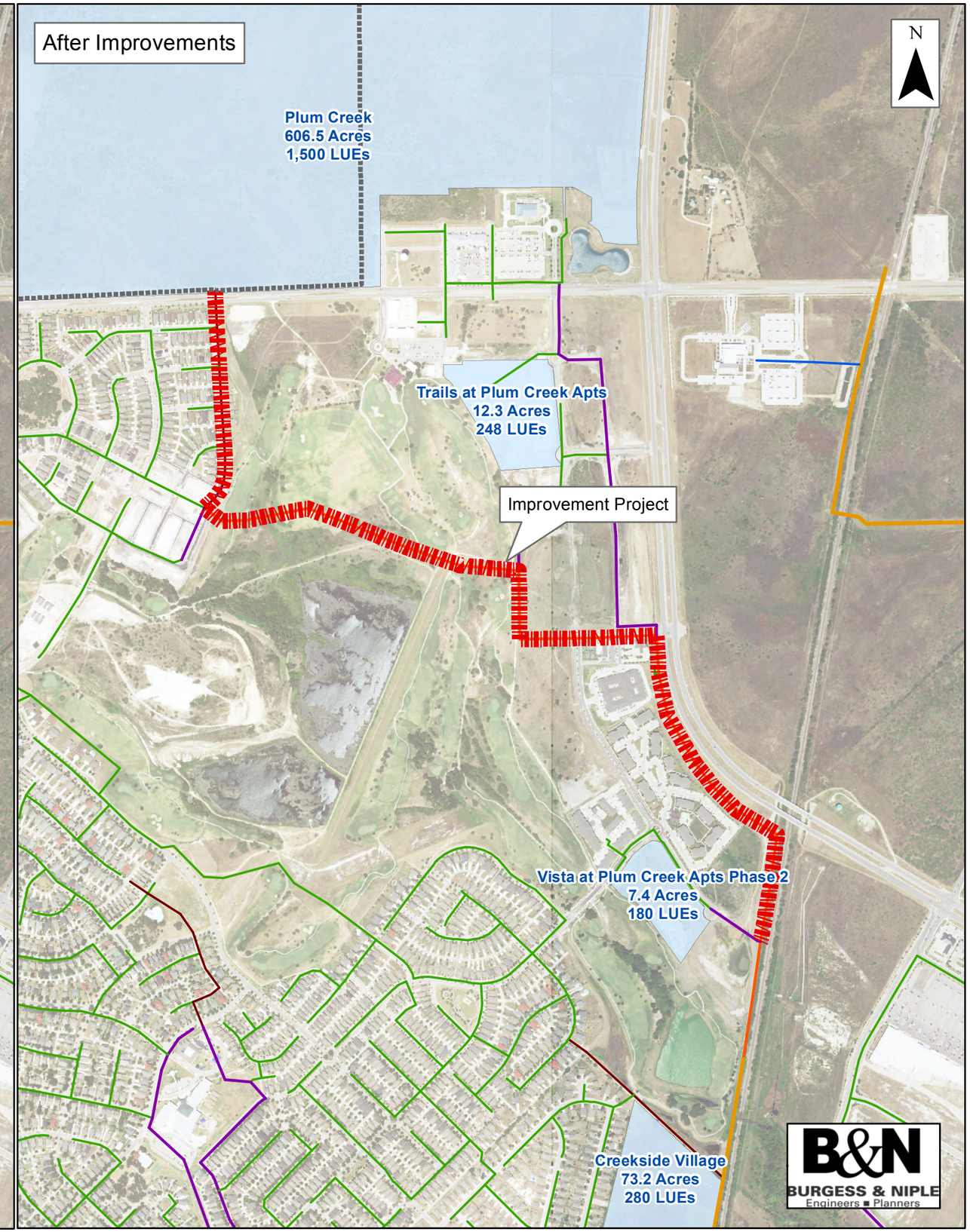
Scenario Identification	Basin Area (Acres)	Projected LUE	Dry Weather Average Daily Flow (MGD)	Wet Weather Peak Flow (MGD)
Anthem	672.0	1,500	0.420	2.10
Plum Creek	606.5	1,500	0.420	1.90
Trails at Plum Creek Apts	12.3	248	0.069	0.14
Total	**1,290.8**	**3,248.0**	**0.909**	**4.14**

Table 7.9.2: Summary of Recommended Improvements Plum Creek Interceptor Improvement Phase 3									
Line ID	Modified Parameter	Original Values				Proposed Values			
		Diameter	Upstream Elevation	Downstream Elevation	Slope	Diameter	Upstream Elevation	Downstream Elevation	Slope
1761.1	Diameter	10	760.09	757.75	0.79%	21	760.09	757.75	0.79%
1763.1	Diameter	10	757.62	755.22	0.80%	21	757.62	755.22	0.80%
1764.1	Diameter	10	755.12	753.32	0.60%	21	755.12	753.32	0.60%
1774.1	Diameter	10	762.50	760.19	0.82%	21	762.50	760.19	0.82%
2014.1	Diameter	15	740.22	738.34	0.70%	21	740.22	738.34	0.70%
2142.1	Diameter	15	736.39	734.64	0.70%	21	736.39	734.64	0.70%
1937.1	Diameter	15	734.54	731.55	1.00%	21	734.54	731.55	1.00%
1936.1	Diameter	15	722.77	719.84	1.01%	21	722.77	719.84	1.01%
2166.1	Diameter	15	719.74	716.31	1.08%	21	719.74	716.31	1.08%
2167.1	Diameter	15	716.21	712.02	1.01%	21	716.21	712.02	1.01%
2168.1	Diameter	15	711.92	709.64	0.48%	21	711.92	709.64	0.48%
2169.1	Diameter	15	709.54	706.92	0.73%	21	709.54	706.92	0.73%
2170.1	Diameter	15	706.82	704.08	0.66%	21	706.82	704.08	0.66%
2171.1	Diameter	15	703.98	701.25	0.68%	21	703.98	701.25	0.68%
2165.1	Diameter	15	731.30	722.87	1.72%	21	731.30	722.87	1.72%
2143.1	Diameter	15	738.24	736.49	0.71%	21	738.24	736.49	0.71%
2144.1	Diameter	15	741.20	740.32	0.20%	21	741.20	740.32	0.20%
2145.1	Diameter	15	742.17	741.30	0.20%	21	742.17	741.30	0.20%
2146.1	Diameter	15	743.25	742.27	0.20%	21	743.25	742.27	0.20%
2147.1	Diameter	15	743.97	743.35	0.20%	21	743.97	743.35	0.20%
2148.1	Diameter	15	745.05	744.07	0.20%	21	745.05	744.07	0.20%
2149.1	Diameter	15	745.49	745.15	0.19%	21	745.49	745.15	0.19%
2150.1	Diameter	15	745.79	745.59	0.12%	21	745.79	745.59	0.12%
1766.1	Diameter	10	753.22	750.04	0.61%	21	753.22	750.04	0.61%

Plum Creek Interceptor Improvement Phase 3
City of Kyle Wastewater

Scale 1:8,000
Proposed New Pipe Diameter: 21 Inches
Total Estimated Footage: 8,440 Feet
Estimated Number of Manholes: 29
General Ground Cover: Grass/ Alongside Road
Average Pipe Depth Range: 6-20 Feet


Plum Creek Interceptor Improvement Phase 3
City of Kyle Wastewater
Before Improvements
Plum Creek
606.5 Acres
1,500 LUEs
Trails at Plum Creek Apts
12.3 Acres
248 LUEs
Overloaded Pipe Segments
Vista at Plum Creek Apts Phase 2
7.4 Acres
180 LUEs
Creekside Village
73.2 Acres
280 LUEs
Plum Creek Interceptor Improvement Phase 3
Connecting Lines
Surcharged Lines
Existing Wastewater Pipe Diameter (Inches)
4
6
8
10
12
15
18
21
24
27
30
Force Mains
Lift Stations
Future Developments
Reflected in Model Results
Not Reflected in Model Results


After Improvements
N
Plum Creek
606.5 Acres
1,500 LUEs
Trails at Plum Creek Apts
12.3 Acres
248 LUEs
Improvement Project
Vista at Plum Creek Apts Phase 2
7.4 Acres
180 LUEs
Creekside Village
73.2 Acres
280 LUEs
B&N
BURGESS & NIPLE
Engineers ■ Planners

7.10 Dacy Lane Wastewater Improvement

Dacy Lane Wastewater Improvements include upsizing seven (7) existing wastewater pipes from 10 inches to 18 inches. All of the developments used in the model for this scenario are listed on Table 10.10.1 along with their acreage, LUE's, average daily flow, and the wet weather peak flow. Table 7.10.2 shows the original pipe parameter values and proposed design values for each line ID in this improvement project. This project runs along Dacy Lane between Bebee Road and the existing 27 inch interceptor at manhole 12. These improvement recommendations are primarily driven by the addition of the Crosswinds Development and the Final Phases of the Meadows at Kyle Development. If all of the proposed developments listed above are constructed, or an equivalent number of LUE's are added to the collection system, then these improvements are required.

Table 7.10.1: Known Development Properties Driving Improvement
Dacy Lane Wastewater Improvement

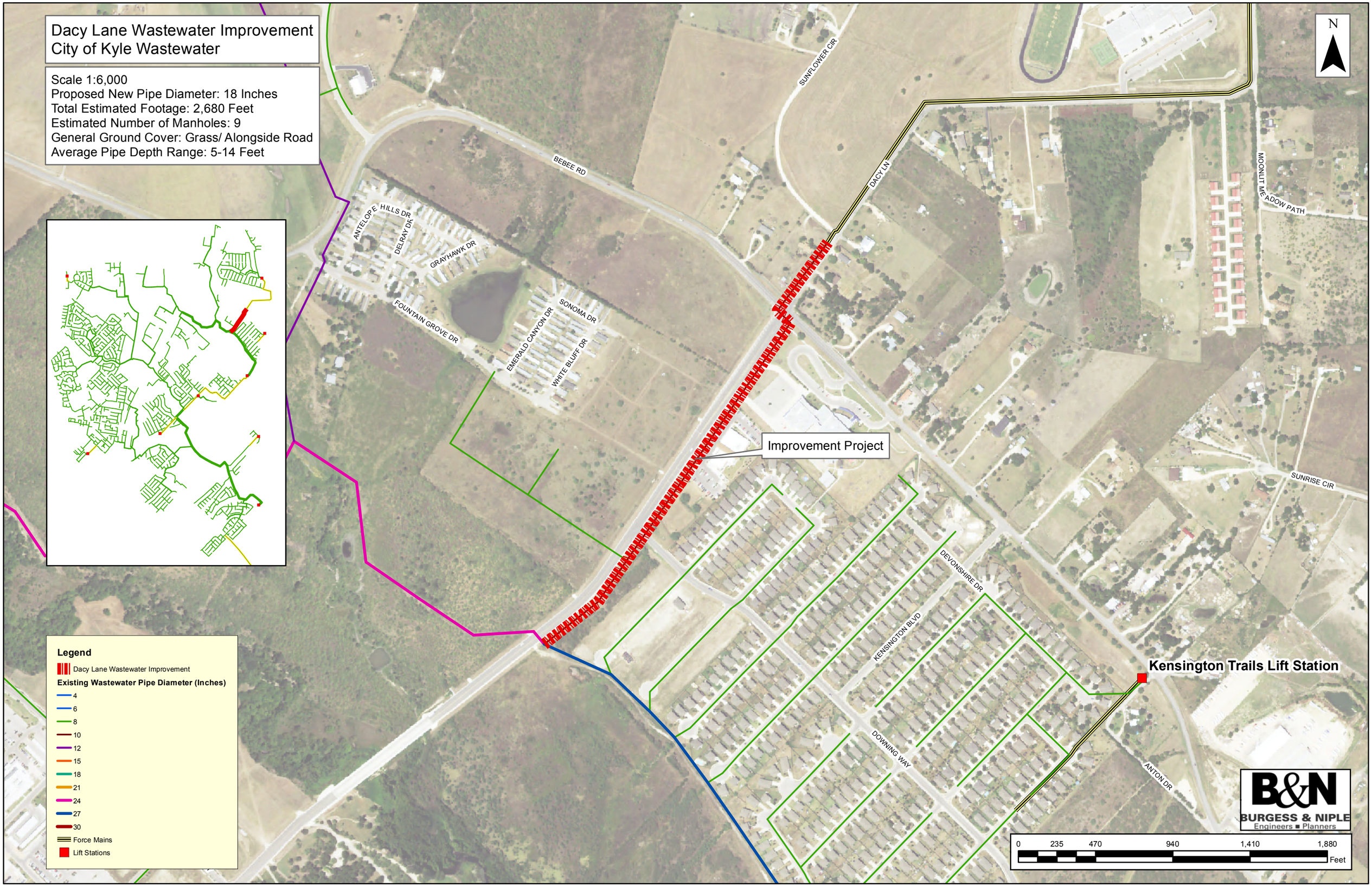
Scenario Identification	Basin Area (Acres)	Projected LUE	Dry Weather Average Daily Flow (MGD)	Wet Weather Peak Flow (MGD)
Crosswinds MUD	443.6	1,750	0.490	1.80
Meadows at Kyle Phases 4,5,6	51.4	350	0.098	0.24
Total	**495.0**	**2,100.0**	**0.588**	**2.04**

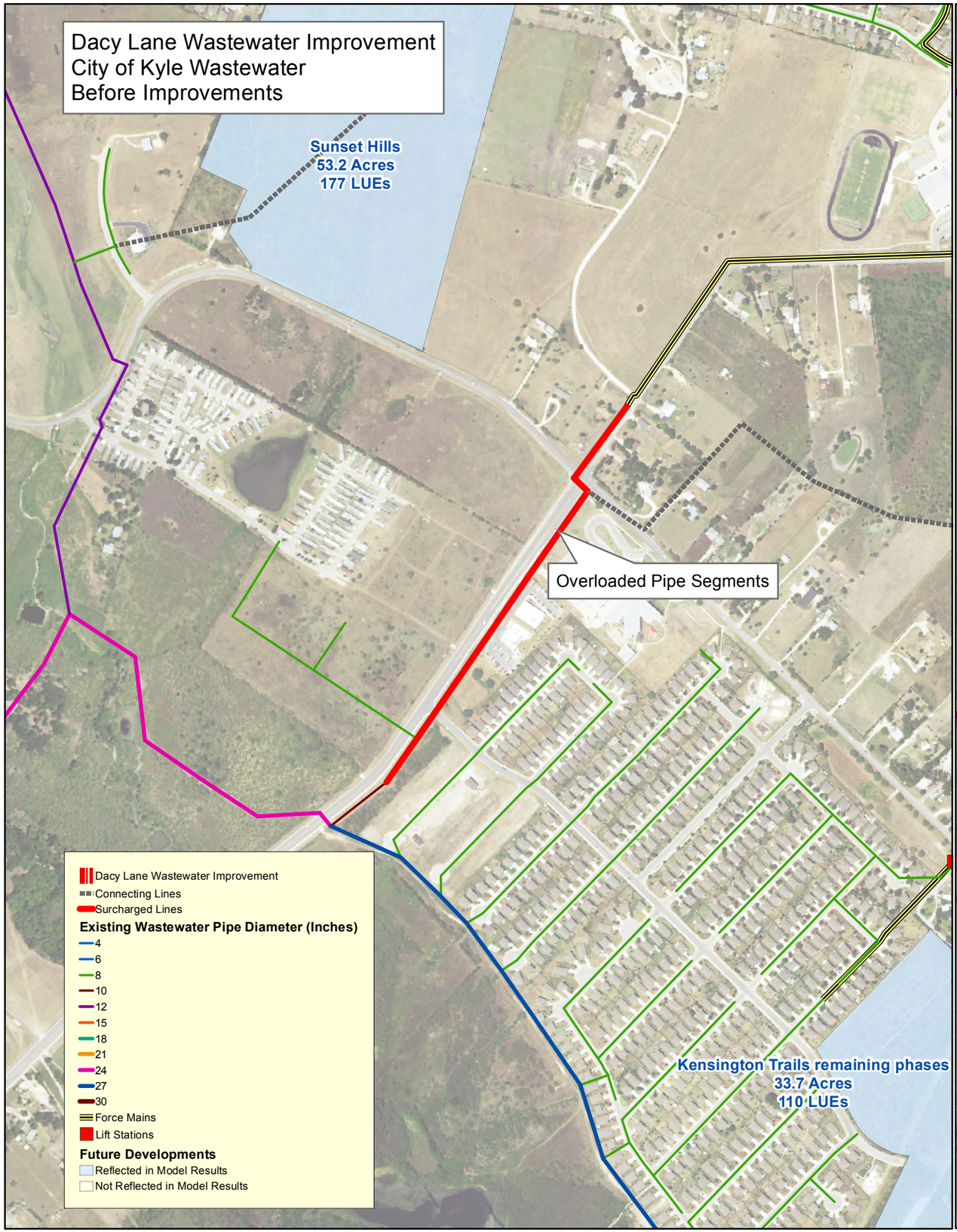
Table 7.10.2: Summary of Recommended Improvements
Dacy Lane Wastewater Improvement

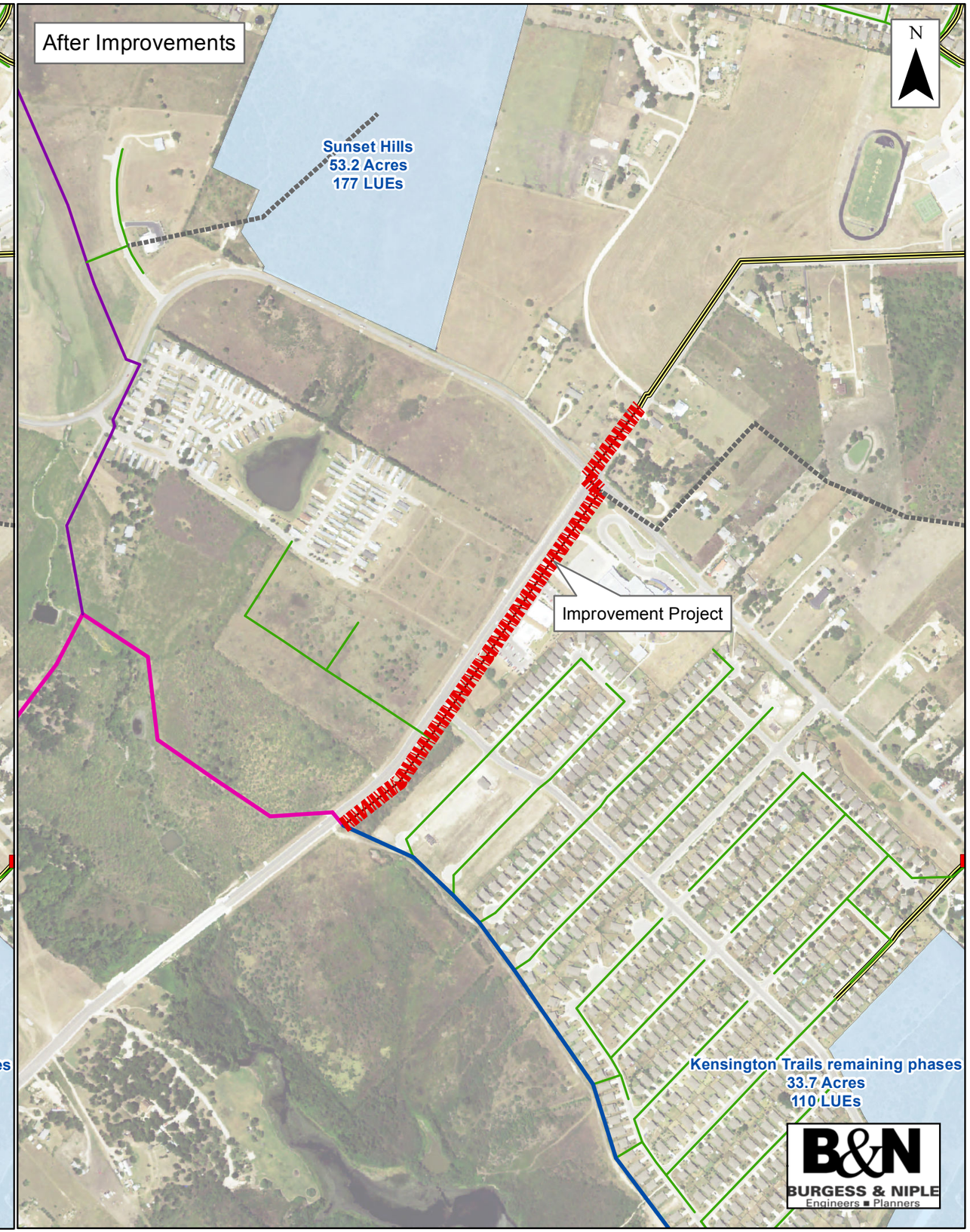
Line ID	Modified Parameter	Original Values				Proposed Values			
		Diameter	Upstream Elevation	Downstream Elevation	Slope	Diameter	Upstream Elevation	Downstream Elevation	Slope
980.1	Diameter	10	733.85	721.47	2.78%	18	733.85	721.47	2.78%
1843.1	Diameter	10	711.94	703.89	1.62%	18	711.94	703.89	1.62%
1844.1	Diameter	10	703.89	688.02	3.06%	18	703.89	688.02	3.06%
982.1	Diameter	10	688.02	677.81	2.04%	18	688.02	677.81	2.04%
983.1	Diameter	10	677.81	664.30	5.05%	18	677.81	664.30	5.05%
984.1	Diameter	12	663.14	659.29	1.08%	18	663.14	659.29	1.08%
981.1	Diameter	10	721.47	711.94	10.16%	18	721.47	711.94	10.16%

Dacy Lane Wastewater Improvement
City of Kyle Wastewater

Scale 1:6,000
Proposed New Pipe Diameter: 18 Inches
Total Estimated Footage: 2,680 Feet
Estimated Number of Manholes: 9
General Ground Cover: Grass/ Alongside Road
Average Pipe Depth Range: 5-14 Feet




Dacy Lane Wastewater Improvement
City of Kyle Wastewater
Before Improvements
Sunset Hills
53.2 Acres
177 LUEs
Overloaded Pipe Segments
Kensington Trails remaining phases
33.7 Acres
110 LUEs
Dacy Lane Wastewater Improvement
Connecting Lines
Surcharged Lines
Existing Wastewater Pipe Diameter (Inches)
4
6
8
10
12
15
18
21
24
27
30
Force Mains
Lift Stations
Future Developments
Reflected in Model Results
Not Reflected in Model Results


After Improvements
N
Sunset Hills
53.2 Acres
177 LUEs
Improvement Project
Kensington Trails remaining phases
33.7 Acres
110 LUEs
B&N
BURGESS & NIPLE
Engineers ■ Planners

7.11 Waterleaf Wastewater Improvement

The Waterleaf Wastewater Improvement Project includes upsizing five (5) existing wastewater pipes from 8 inches to 10 inches. All of the developments used in the model for this scenario are listed on Table 7.11.1 along with their acreage, LUE's, average daily flow, and the wet weather peak flow. Table 7.11.2 shows the original pipe parameter values and proposed design values for each line ID in this improvement project. This project runs east along New Bridge Drive, north along Japonica Ct, and east along Abundance Lane. These improvement recommendations are primarily driven by the addition of the Cool Springs Development. These recommendations are assuming that the Cool Springs development will tie its wastewater lines into the existing system at New Bridge Drive and Jasmine Cove.

Table 7.11.1: Known Development Properties Driving Improvement
Waterleaf Wastewater Improvement

Scenario Identification	Basin Area (Acres)	Projected LUE	Dry Weather Average Daily Flow (MGD)	Wet Weather Peak Flow (MGD)
Cool Springs	125.2	372	0.104	0.42
Total	**125.2**	**372.0**	**0.104**	**0.42**

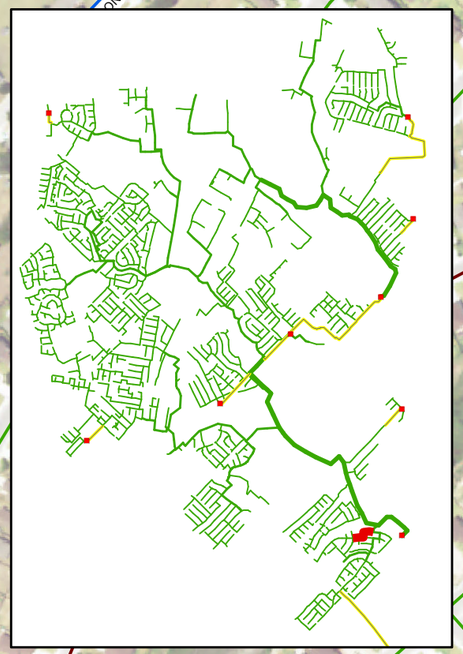
Table 7.11.2: Summary of Recommended Improvements
Waterleaf Wastewater Improvement

Line ID	Modified Parameter	Original Values				Proposed Values			
		Diameter	Upstream Elevation	Downstream Elevation	Slope	Diameter	Upstream Elevation	Downstream Elevation	Slope
661.1	Diameter	8	617.24	614.45	0.94%	10	617.24	614.45	0.94%
635.1	Diameter	8	614.35	613.10	0.50%	10	614.35	613.10	0.50%
634.1	Diameter	8	613.00	611.65	0.50%	10	613.00	611.65	0.50%
636.1	Diameter	8	611.55	609.94	0.50%	10	611.55	609.94	0.50%
638.1	Diameter	8	609.84	597.66	7.22%	10	609.84	597.66	7.22%

Note: The Waterleaf Wastewater Improvement was recommended based upon the Cool Springs development route to the existing 8-inch pipeline. Following the model completion, a decision was made to connect the Cool Springs development to a 15-inch pipe instead. This improvement recommendation is no longer required.

Waterleaf Wastewater Improvement
City of Kyle Wastewater

Scale 1:4,000
Proposed New Pipe Diameter: 10 Inches
Total Estimated Footage: 1,310 Feet
Estimated Number of Manholes: 6
General Ground Cover: Asphalt Road
Average Pipe Depth Range: 7-19 Feet



N

FLORA PASS

TOWER DR

SHEEP TRAIL DR

Improvement Project

WWTP

WATERLEAF BLVD

PASTURE CV

PEACH TREE PASS

Legend

Waterleaf Wastewater Improvement

Existing Wastewater Pipe Diameter (Inches)

- 4
- 6
- 8
- 10
- 12
- 15
- 18
- 21
- 24
- 27
- 30
- Force Mains
- Lift Stations

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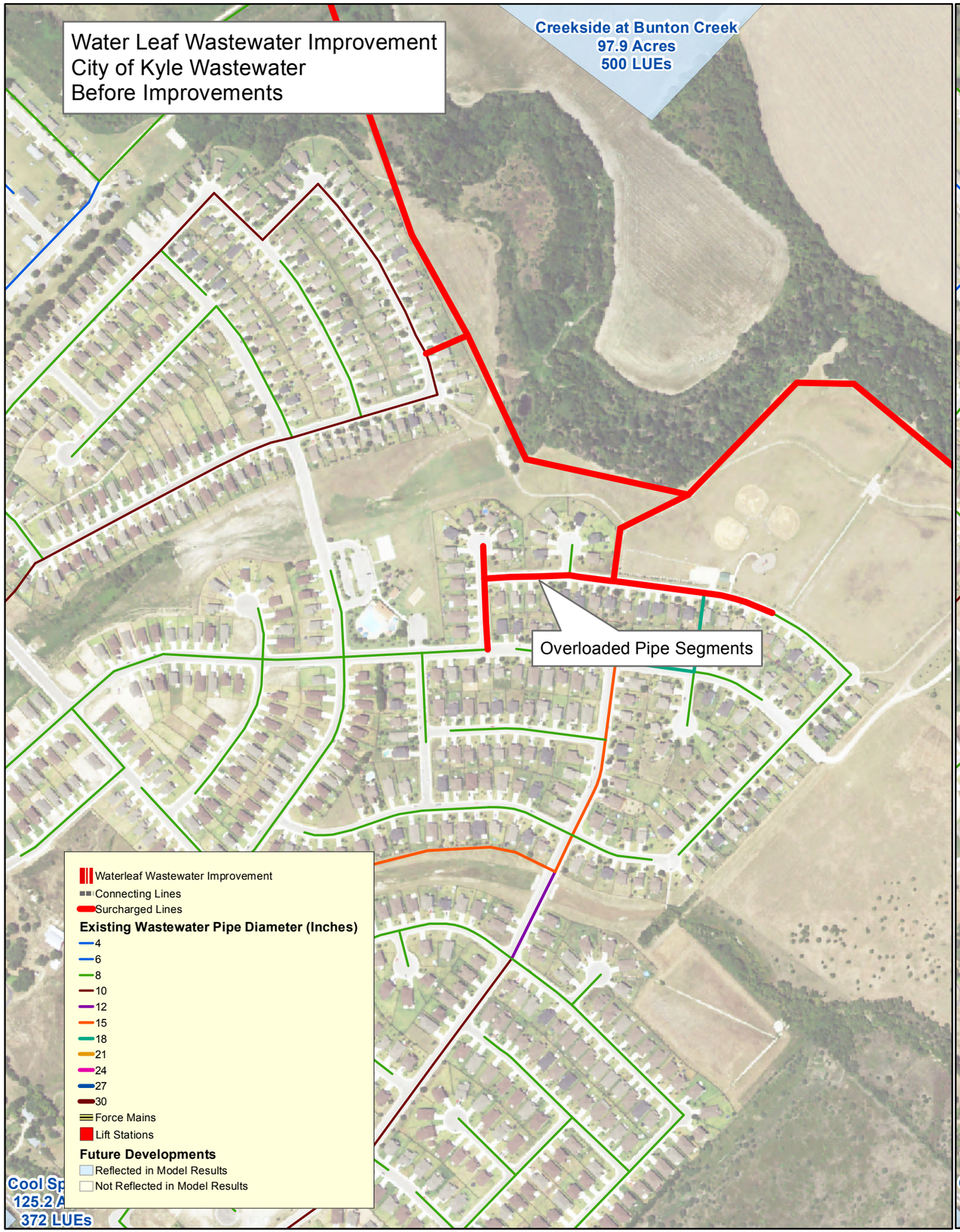
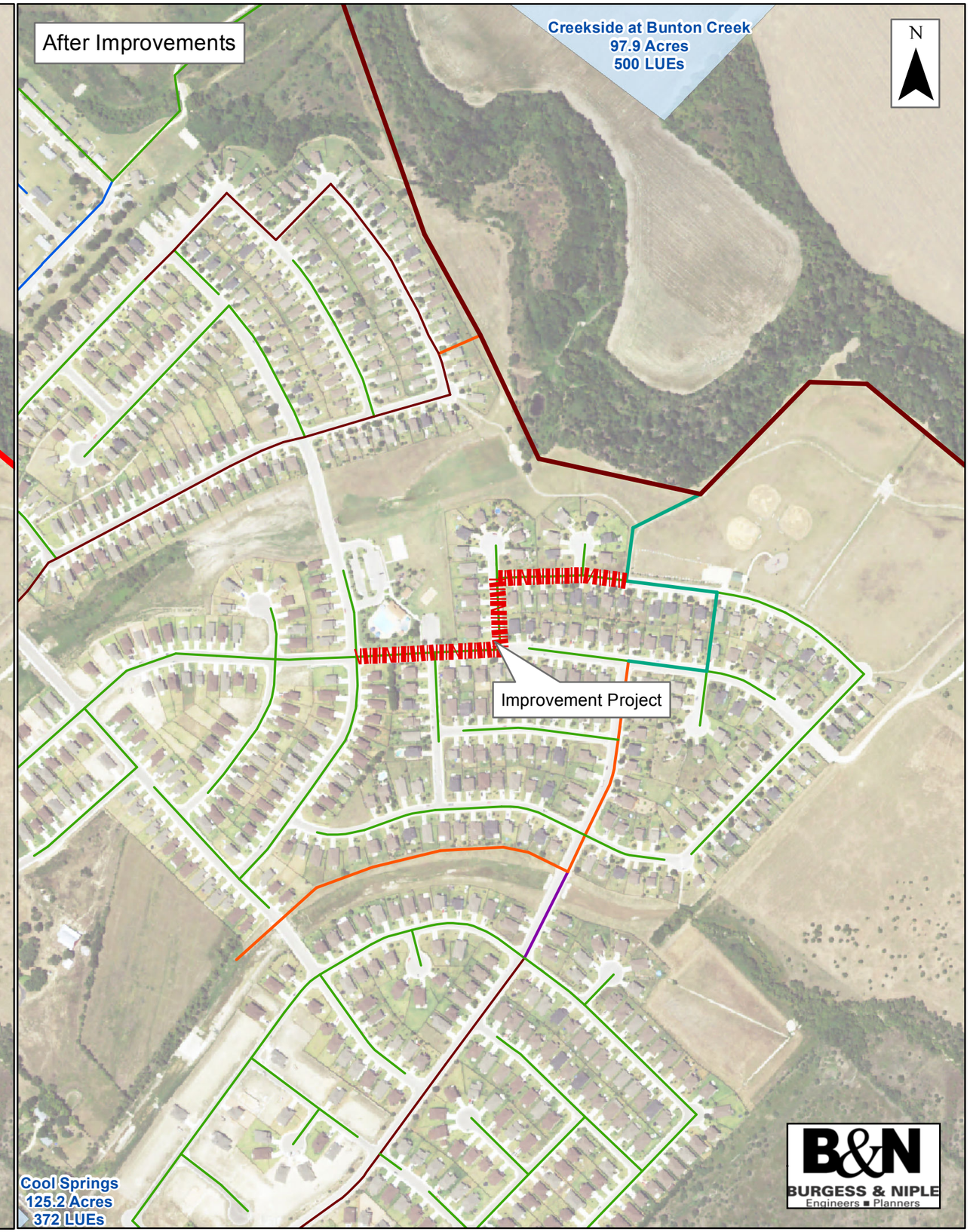
0 155 310 620 930 1,240
Feet


Water Leaf Wastewater Improvement
City of Kyle Wastewater
Before Improvements
Creekside at Bunton Creek
97.9 Acres
500 LUEs
Overloaded Pipe Segments
Waterleaf Wastewater Improvement
Connecting Lines
Surcharged Lines
Existing Wastewater Pipe Diameter (Inches)
4
6
8
10
12
15
18
21
24
27
30
Force Mains
Lift Stations
Future Developments
Reflected in Model Results
Not Reflected in Model Results
Cool Sp
125.2 A
372 LUEs


After Improvements
Creekside at Bunton Creek
97.9 Acres
500 LUEs
N
Improvement Project
Cool Springs
125.2 Acres
372 LUEs
B&N
BURGESS & NIPLE
Engineers ■ Planners

7.12 Southlake Lift Station Improvement

The Southlake Lift Station Improvement Project is designed to increase the lift stations' overall capacity and to address known operations, maintenance, and structural issues. All of the developments used in the model for this scenario are listed on Table 7.12.2 along with their acreage, LUE's, average daily flow, and the wet weather peak flow. Table 7.12.1 shows the average daily flow and the peak flow requirements that the Southlake lift station will need to convey flow from all listed new developments and existing infrastructure. These improvement recommendations are primarily driven by the addition of the Crosswinds Development, Meadows at Kyle Final Phases, Sunset Hills, Hays Commerce Park, Kensington Trails Final Phases, and The Strand Apartments. If all of the proposed developments listed above are constructed, or an equivalent number of LUE's are added to the collection system, then these improvements are required.

Table 7.12.1: Capacity Requirements For All Known Developments	
Southlake Lift Station Improvement	
Average Daily Flow	1.3 MGD
Wet Weather Peak Flow	6.0 MGD

Table 7.12.2: Known Development Properties Driving Improvement
Southlake Lift Station Improvement

Scenario Identification	Basin Area (Acres)	Projected LUE	Dry Weather Average Daily Flow (MGD)	Wet Weather Peak Flow (MGD)
Crosswinds MUD	443.6	1,750	0.490	1.80
Hays Commerce Park	105.9	24	0.007	0.03
Kensington Trails remaining phases	33.7	110	0.031	0.16
Meadows at Kyle Phases 4,5,6	51.4	350	0.098	0.24
Sunset Hills	53.2	177	0.050	0.14
The Strand Apartments	7.6	160	0.045	0.23
Total	**695.4**	**2,571.0**	**0.720**	**2.59**

Southlake Lift Station Improvement
City of Kyle Wastewater
Scale 1:2,000
Average Daily Flow: 1.3 MGD
Wet Weather Peak Flow: 6.0 MGD
N
Southlake Lift Station
Improvement Project
SPILLWAY DR
LAGO GRANDE DR
Legend
Existing Wastewater Pipe Diameter (Inches)
4
6
8
10
12
15
18
21
24
27
30
Force Mains
Lift Stations
B&N
BURGESS & NIPLE
Engineers ■ Planners
0
75
150
300
450
600
Feet

Southlake Lift Station Improvement
City of Kyle Wastewater CIP
Before Improvements
Southlake Lift Station
Connecting Lines
Surcharged Lines
Existing Wastewater Pipe Diameter (Inches)
4
6
8
10
12
15
18
21
24
27
30
Force Mains
Lift Stations
Future Developments
Reflected in Model Results
Not Reflected in Model Results

After Improvements
N
Kensington Trails remaining phases
33.7 Acres
110 LUEs
Southlake Lift Station
B&N
BURGESS & NIPLE
Engineers ■ Planners

8.0 Capital Improvement Projects

8.1 Improvement Options

A number of options exist for improvement to the wastewater collection system, other than traditional open-cut replacements. Among these, are parallel pipes, relief sewers, and flow diversions. A recent survey of construction bid prices in Environmental Protection Agency Region 6 suggests that the difference in cost between trenchless methods and a traditional open cut method are negligible. Rerouting of wastewater flows from the Main Interceptor to the Bunton Creek Interceptor also has merit, based on conceptual modeling simulations. Implementation of this alternative would serve to relieve the overburdened Main Interceptor. A further investigation including hydraulic and constructability analysis of this major rerouting scenario is recommended during subsequent planning efforts.

Maintenance of existing system capacity is critical while improvements are being planned, budgeted and constructed. In order to maintain the capacity represented in the hydraulic model, debris and sediment must be managed and minimized in the system. A systematic pipeline cleaning program is recommended to prevent this condition from compromising the existing wastewater conveyance capacity of the existing system.

A final method for the City of Kyle to consider in lieu of major system improvements is an aggressive sanitary sewer evaluation and rehabilitation program. A typical program will serve to reduce RDII flow to the system, thus reducing the need for larger pipelines. It has also been noted in meetings with City staff that such a program is planned for the old town part of the City of Kyle. This activity can serve to delay major improvements to the system. However, the RDII elimination program must be operated on a continuous basis to maximize its effectiveness.

8.2 Other Project Related Recommendations

A number of other recommendations are offered for improvement and maintenance of the hydraulic model.

Lift Station Parameters: The lift stations that have been incorporated into the hydraulic model should be reviewed and supplemented with additional pump performance data as it becomes available. The lift station pump performance criteria utilized in the model is based on physical draw-down testing information conducted by B&N for this project. As pumps and other lift station appurtenances age, less wastewater is able to pass through the station with the same amount of work by the pumps. Pump performance testing and lift station flow monitoring should be conducted periodically to confirm the values used in the model.

Global Positioning System Mapping and Surveying: As the overall model attributes are enhanced to increase model accuracy, it will be necessary to obtain accurate elevation data. A phased program to gather three centimeter accuracy GPS data on all system assets should be

implemented, along with a program to confirm system connectivity, pipe diameters, and materials.

Model Maintenance: New construction projects and system rehabilitation will occur. It is recommended that a program be implemented that will apply these changes to the existing model configuration. This can be completed by City of Kyle staff or as a function of an on-going model maintenance and update contract. Changes in the system that will occur as a result of other wastewater system projects will need to be incorporated and new simulations will need to be run to track system operational improvement.

Incorporate All SSES Data: In an effort to prioritize system improvements, B&N recommends that all historic and future SSES projects be cross-referenced with the model database and the recommended improvements stemming from this modeling effort. Interpreted elevations, manhole depth, pipe diameters, etc can be obtained from these studies, as well as more detailed information such as pipe condition and construction materials. This data would support a more accurate and detailed analysis of the collection system and provide additional information needed to support the City's Capital Improvements Plan.

8.2 Cost Estimates for Capital Improvement Projects

In determining an estimate of probable costs for the improvement projects listed in this report, B&N incorporated an industry standard cost estimation methodology. This method does not consider items such as utility relocation and right-of-way acquisition. This creates a baseline to compare and prioritize system improvement recommendations presented by the City of Kyle to those presented in this report. The costs presented in the report are based on Table 8.0.1 and are calculated using 2015 dollars. It should be noted that the total cost values in Table 8.0.2 include an allowance for engineering costs and construction contingencies.

The cost matrix is based on an open cut installation method for implementing the recommended pipe capacity improvements and was developed using publicly available information. If another method of installation is to be implemented, such as boring, tunneling, other trenchless methods, the estimated cost should be modified to compensate for the cost of the selected construction method.

Table 8.0.1 illustrates the unit costs used to perform cost quantity takeoffs in estimating total costs. Unit costs are based on regional cost data from the City of Kyle for smaller pipe construction costs and the City of Austin for larger pipe construction costs. 54 inch pipelines were assumed to require 60 inch diameter manholes and all other projects were assumed to use 48 inch diameter manholes. The approximate footage of ground cover (pavement or natural ground) was estimated using 2014 aerial photographs.

Table 8.0.1: Estimated Construction Costs for Recommended Improvement Projects		
Description	**Unit**	**Unit Price**
Hot Mix Asphalt Concrete Pavement	SF	$ 18.00
Native Grassland Seeding and Planting	SY	$ 3.50
Pipe, 10" Dia., PVC Type (All Depths) Including Excavation and Backfill	LF	$ 85.00
Pipe, 12" Dia., PVC Type (All Depths) Including Excavation and Backfill	LF	$ 95.00
Pipe, 18" Dia., PVC Type (All Depths) Including Excavation and Backfill	LF	$ 130.00
Pipe, 21" Dia., PVC Type (All Depths) Including Excavation and Backfill	LF	$ 155.00
Pipe, 24" Dia., PVC Type (All Depths) Including Excavation and Backfill	LF	$ 250.00
Pipe, 30" Dia., PVC Type (All Depths) Including Excavation and Backfill	LF	$ 325.00
Pipe, 36" Dia., PVC Type (All Depths) Including Excavation and Backfill	LF	$ 325.00
Pipe, 54" Dia., PVC Type (All Depths) Including Excavation and Backfill	LF	$ 365.00
Manhole, Standard Pre-Cast Manhole With Pre-Cast Base, 48-Inch Diameter	EACH	$ 5,500.00
Manhole, Standard Pre-Cast Manhole With Pre-Cast Base, 60-Inch Diameter	EACH	$ 9,000.00

Table 8.0.2 on the following page, summarizes estimated cost for each individual improvement project discussed in this report. Costs are broken down into estimated construction cost, estimated engineering cost, 15% construction contingency, and the total estimated cost. Total pipe footages and the pipe depth ranges are estimated from GIS data. The number of manholes is estimated by placing a manhole every 300 feet of pipe or applying the number of manholes that currently exist, whichever is greater.

These improvements are the result of engineering analysis of the model results and not necessarily the result of any design criteria analysis. The recommendations are designed to reduce or eliminate sanitary sewer overflows. Based on the results of the hydraulic analysis for the design storm, the implementation of the recommended improvements will serve to protect the City of Kyle from unauthorized discharges during the storm events equal to or smaller than a 5-year 6-hour design storm event.

The hydraulic model should also be configured to examine and explore various combinations of system improvements and pipe line routes that will serve the entire City of Kyle wastewater service area. The results from this modeling engagement are focused on required improvements to serve known developments. Map 8.01, following Table 8.02, presents all City of Kyle Recommended Wastewater System Improvements.

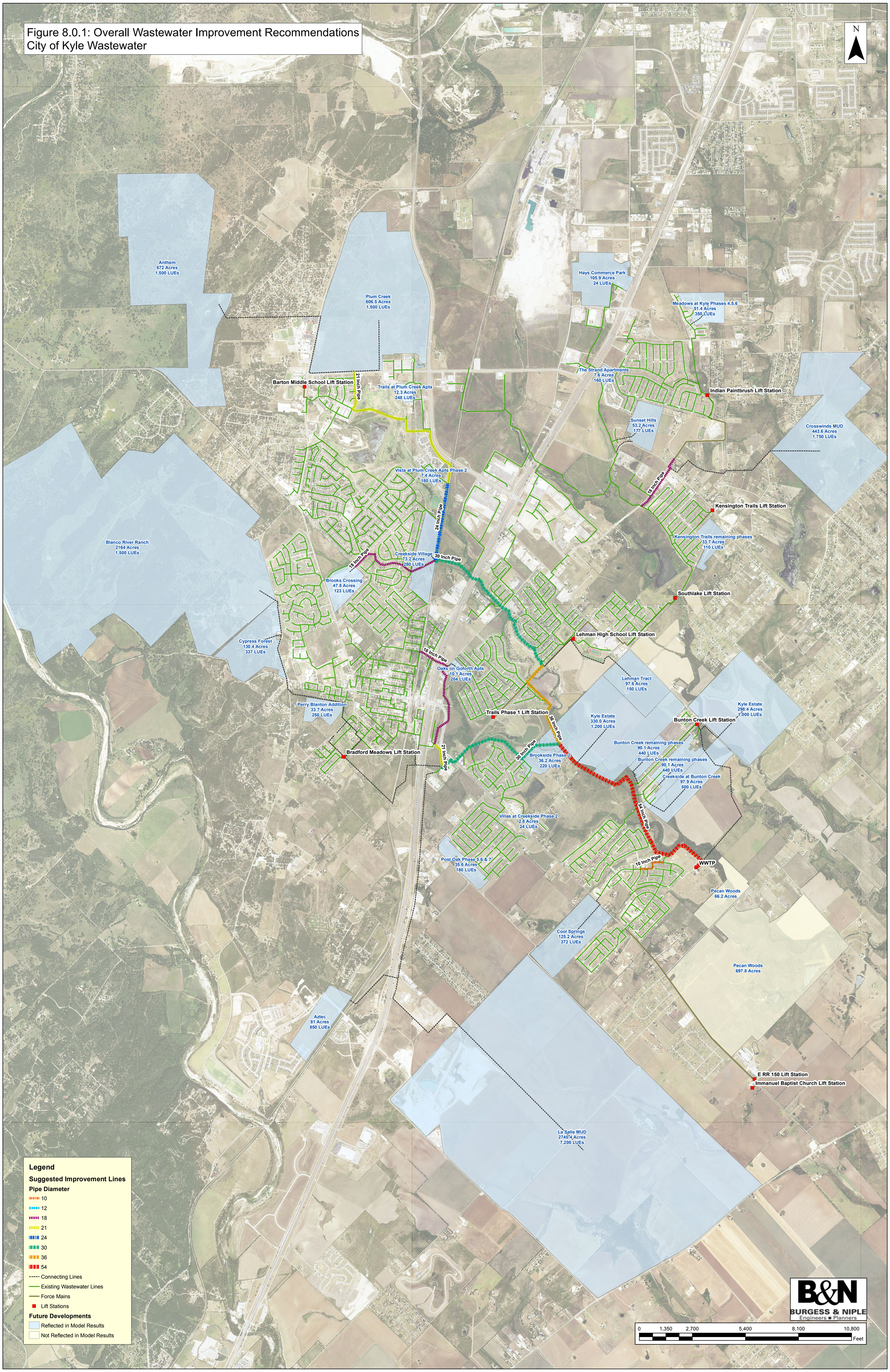
Table 8.0.2: Estimated Construction Costs for Recommended Improvement Projects[1]

Improvement Project	Pipe Size (inches)	Total Footage (LF)	Estimated Manhole Number	General Topography	Depths (feet)	Estimated Preliminary Construction Cost	Estimated Engineering Cost	15% Contingency	Total Estimated Cost
WWTP Interceptor Improvement Phase 1	54	6,060	21	Grass/Open Field	11-17	$2,598,900	$389,900	$448,400	$3,437,200
WWTP Interceptor Improvement Phase 2	54	4,080	14	Grass/Open Field	9-18	$1,745,400	$261,900	$301,100	$2,308,400
Four Seasons Farms Interceptor Improvement	30	6,320	22	Grass/Open Field	6-30	$2,337,300	$350,600	$403,200	$3,091,100
Center Street Village Wastewater Improvement	18 & 21	6,409	25	Grass/ Adjacent to Roadway	5-15	$1,088,200	$163,300	$187,800	$1,439,300
North Trails Interceptor Improvement	36	4,340	15	Grass/Open Field	9-26	$1,614,520	$242,200	$278,600	$2,135,400
Steeplechase Interceptor Improvement	30	7,380	28	Grass/Asphalt Road	6-12	$4,873,800	$731,100	$840,800	$6,445,700
Plum Creek Interceptor Improvement Phase 1	18	4,310	18	Grass/Drainage Easement	6-15	$726,400	$109,000	$125,400	$960,800
Plum Creek Interceptor Improvement Phase 2	24	3,460	12	Grass/Along Rail Road	6-15	$992,900	$149,000	$171,300	$1,313,200
Plum Creek Interceptor Improvement Phase 3	21	8,440	29	Grass/ Adjacent to Roadway	6-20	$1,622,000	$243,300	$279,800	$2,145,100
Dacy Lane Wastewater Improvement	18	2,680	9	Grass/ Adjacent to Roadway	5-14	$437,600	$65,700	$75,500	$578,800
Waterleaf Wastewater Improvement	10	1,310	6	Asphalt Road	7-19	$993,300	$149,000	$171,400	$1,313,700
Southlake Lift Station	– – –	– – –	– – –	– – –	– – –	$2,901,500	$435,300	$500,600	$3,837,400
								.	**$25,168,700**

[1] Costs are presented in 2015 dollars.

Note: The Waterleaf Wastewater Improvement was recommended based upon the Cool Springs development route to the existing 8-inch pipeline. Following the model completion, a decision was made to connect the Cool Springs development to a 15-inch pipe instead. This improvement recommendation is no longer required.

Figure 8.0.1: Overall Wastewater Improvement Recommendations
City of Kyle Wastewater



Appendix 1.0

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
0.1	0	673.52	2	672.16	312.80	0.40%	21	0.011	0.005	0.660	0.02	7.980	0.1	1.4
1.1	1	675.14	0	673.52	372.50	0.40%	21	0.011	0.005	0.630	0.13	7.982	0.1	7.6
2.1	2	672.16	30	671.65	86.10	0.60%	21	0.011	0.027	0.960	0.08	9.313	0.3	4.8
3.1	3	676.75	1	675.14	381.60	0.40%	21	0.011	0.005	0.630	0.13	7.861	0.1	7.6
4.1	4	679.10	3	676.75	448.80	0.50%	21	0.011	0.005	0.640	0.15	8.758	0.1	8.6
5.1	5	681.47	4	679.10	446.30	0.50%	21	0.011	0.005	0.640	0.02	8.819	0.1	1.2
6.1	6	682.93	5	681.47	274.70	0.50%	21	0.011	0.005	0.640	0.17	8.822	0.1	9.5
7.1	7	683.56	6	682.93	103.80	0.60%	21	0.011	0.005	0.640	0.02	9.426	0.1	1.2
8.1	8	689.40	7	683.56	446.50	1.30%	8	0.011	0.003	0.560	0.01	1.056	0.3	1.2
9.1	9	694.00	8	689.40	445.40	1.00%	8	0.011	0.003	0.570	0.01	0.938	0.3	1.4
10.1	10	696.31	9	694.00	349.20	0.70%	8	0.011	0.000	0.000	0.17	0.751	0.0	24.8
11.1	11	700.50	10	696.31	272.80	1.50%	8	0.011	0.000	0.000	0.42	1.144	0.0	62.8
12.1	12	653.54	899	652.26	388.60	0.30%	27	0.011	0.345	2.140	0.35	13.576	2.5	15.4
13.1	13	654.43	12	653.54	85.80	1.00%	24	0.011	0.149	2.310	0.14	17.593	0.8	7.1
14.1	14	655.55	13	654.43	316.90	0.40%	24	0.011	0.149	1.640	0.18	10.272	1.5	9.0
15.1	15	656.27	14	655.55	346.00	0.20%	24	0.011	0.150	1.370	0.20	7.882	1.9	10.2
16.1	16	656.70	15	656.27	338.70	0.10%	24	0.011	0.150	1.160	0.23	6.157	2.4	11.5
17.1	17	657.72	16	656.70	421.80	0.20%	24	0.011	0.151	1.450	0.20	8.497	1.8	9.9
18.1	18	658.65	17	657.72	394.20	0.20%	24	0.011	0.152	1.440	0.27	8.393	1.8	13.3
19.1	19	659.20	18	658.65	285.50	0.20%	24	0.011	0.098	1.120	0.23	7.583	1.3	11.5
20.1	20	659.93	19	659.20	349.70	0.20%	24	0.011	0.098	1.150	0.22	7.895	1.2	11.2
21.1	21	661.25	20	659.93	501.00	0.30%	24	0.011	0.098	1.250	0.16	8.870	1.1	8.2
22.1	22	662.00	21	661.25	476.00	0.20%	24	0.011	0.098	1.050	0.23	6.859	1.4	11.3
23.1	23	662.60	22	662.00	281.20	0.20%	24	0.011	0.098	1.160	0.23	7.982	1.2	11.6
24.1	24	663.55	23	662.60	337.80	0.30%	24	0.011	0.098	1.270	0.16	9.164	1.1	8.1
25.1	25	663.80	24	663.55	360.70	0.10%	24	0.011	0.098	0.790	0.24	4.549	2.2	12.0
26.1	26	664.50	25	663.80	334.30	0.20%	24	0.011	0.098	1.150	0.17	7.907	1.2	8.6
27.1	27	665.80	26	664.50	522.70	0.20%	24	0.011	0.098	1.220	0.17	8.617	1.1	8.3
28.1	28	667.87	2204	667.73	42.90	0.30%	15	0.011	0.070	1.240	0.15	2.819	2.5	12.3
29.1	29	669.70	2205	667.20	355.70	0.70%	21	0.011	0.027	0.990	0.26	10.145	0.3	15.0
30.1	30	671.65	29	669.70	351.80	0.60%	21	0.011	0.027	0.850	0.23	9.011	0.3	13.2
31.1	31	666.20	18	658.65	451.50	1.70%	12	0.011	0.058	1.450	0.52	3.519	1.7	51.9
32.1	32	673.90	31	666.20	506.40	1.50%	12	0.011	0.058	1.460	0.10	3.356	1.7	10.3
33.1	33	679.85	34	678.86	166.80	0.60%	12	0.011	0.332	2.880	0.28	2.096	15.8	27.8
34.1	34	678.86	35	678.05	142.10	0.60%	12	0.011	0.333	2.840	0.28	2.055	16.2	28.1
35.1	35	678.05	36	676.54	277.00	0.50%	12	0.011	0.333	2.810	0.43	2.009	16.6	43.5
36.1	36	676.54	37	675.74	230.60	0.30%	12	0.011	0.335	2.380	0.32	1.603	20.9	32.1
37.1	37	675.74	38	675.04	200.00	0.30%	12	0.011	0.336	2.390	0.32	1.610	20.9	32.1
38.1	38	675.04	39	674.46	159.70	0.40%	12	0.011	0.337	2.420	0.32	1.640	20.5	31.8
39.1	39	674.46	40	673.85	170.30	0.40%	12	0.011	0.337	2.410	0.32	1.629	20.7	31.9

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
40.1	40	673.85	41	673.38	124.90	0.40%	12	0.011	0.340	2.470	0.32	1.670	20.4	31.6
41.1	41	673.38	42	672.99	118.00	0.30%	12	0.011	0.340	2.360	0.33	1.564	21.7	32.7
42.1	42	672.99	43	672.60	117.50	0.30%	12	0.011	0.343	2.370	0.33	1.568	21.9	32.7
43.1	43	672.60	44	672.02	190.90	0.30%	12	0.011	0.346	2.290	0.34	1.500	23.1	33.8
44.1	44	672.02	45	671.63	132.10	0.30%	12	0.011	0.346	2.280	0.34	1.479	23.4	33.9
45.1	45	671.63	2031	662.61	600.40	1.50%	12	0.011	0.346	3.860	0.23	3.335	10.4	23.3
46.1	46	674.83	39	674.46	90.30	0.40%	6	0.011	0.000	0.000	0.14	0.274	0.0	28.5
47.1	47	675.32	46	674.83	78.20	0.60%	6	0.011	0.000	0.000	0.00	0.339	0.0	0.0
48.1	48	694.42	986	686.84	264.20	2.90%	8	0.011	0.001	0.530	0.67	1.563	0.0	100.0
49.1	49	667.50	985	656.99	205.40	5.10%	8	0.011	0.004	0.590	0.01	2.088	0.2	1.8
50.1	50	650.00	1422	644.14	61.20	9.60%	8	0.011	0.010	0.700	0.03	2.856	0.3	3.8
51.1	51	654.46	50	650.00	233.00	1.90%	8	0.011	0.008	0.750	0.04	1.277	0.6	5.6
52.1	52	655.00	51	654.46	109.20	0.50%	8	0.011	0.008	0.760	0.04	0.649	1.2	6.0
53.1	53	655.40	52	655.00	76.70	0.50%	8	0.011	0.008	0.760	0.04	0.667	1.2	6.0
54.1	54	666.51	53	655.40	362.20	3.10%	8	0.011	0.006	0.640	0.67	1.616	0.4	100.0
55.1	55	676.70	54	666.51	172.90	5.90%	8	0.011	0.006	0.640	0.02	2.241	0.3	2.7
56.1	56	677.21	55	676.70	102.80	0.50%	8	0.011	0.005	0.700	0.03	0.650	0.8	4.7
57.1	57	682.00	56	677.21	186.00	2.60%	8	0.011	0.000	0.000	0.00	1.481	0.0	0.0
58.1	58	677.82	56	677.21	129.70	0.50%	8	0.011	0.005	0.650	0.02	0.633	0.7	3.5
59.1	59	678.40	58	677.82	126.00	0.50%	8	0.011	0.004	0.640	0.02	0.626	0.7	3.3
60.1	60	679.20	59	678.40	115.90	0.70%	8	0.011	0.002	0.590	0.01	0.767	0.3	2.1
61.1	61	681.69	60	679.20	258.50	1.00%	8	0.011	0.000	0.500	0.25	0.906	0.0	37.8
62.1	62	702.98	59	678.40	405.80	6.10%	8	0.011	0.000	0.000	0.00	2.272	0.0	0.0
63.1	63	695.01	65	694.44	133.40	0.40%	8	0.011	0.002	0.540	0.01	0.603	0.3	0.8
64.1	64	695.53	63	695.01	120.30	0.40%	8	0.011	0.000	0.000	0.00	0.607	0.0	0.0
65.1	65	694.44	66	685.22	327.00	2.80%	8	0.011	0.002	0.570	0.01	1.550	0.2	1.6
66.1	66	685.22	67	677.24	325.00	2.50%	8	0.011	0.004	0.630	0.02	1.446	0.3	2.9
67.1	67	677.24	68	672.47	71.80	6.60%	8	0.011	0.006	0.630	0.02	2.378	0.2	2.6
68.1	68	672.47	69	669.67	164.50	1.70%	8	0.011	0.006	0.700	0.03	1.204	0.5	4.7
69.1	69	669.67	70	667.40	163.30	1.40%	8	0.011	0.007	0.640	0.02	1.088	0.6	2.8
70.1	70	667.40	71	662.40	163.70	3.10%	8	0.011	0.007	0.660	0.02	1.613	0.4	3.1
71.1	71	662.40	1420	652.06	166.60	6.20%	8	0.011	0.010	0.720	0.03	2.300	0.4	4.3
72.1	72	663.75	73	663.36	83.40	0.50%	8	0.011	0.000	0.000	0.00	0.631	0.0	0.0
73.1	73	663.36	71	662.40	245.60	0.40%	8	0.011	0.001	0.530	0.00	0.577	0.2	0.6
74.1	74	705.06	75	705.02	140.20	0.00%	8	0.011	0.000	0.000	0.00	0.156	0.0	0.0
75.1	75	705.02	76	703.27	501.80	0.30%	8	0.011	0.001	0.530	0.00	0.545	0.2	0.6
76.1	76	703.27	77	697.90	462.60	1.20%	8	0.011	0.003	0.550	0.30	0.995	0.3	45.6
77.1	77	697.90	78	685.43	350.00	3.60%	8	0.011	0.005	0.610	0.67	1.742	0.3	100.0
78.1	78	685.43	79	658.55	404.10	6.70%	8	0.011	0.006	0.640	0.02	2.380	0.3	2.9
79.1	79	658.55	80	651.67	94.70	7.30%	8	0.011	0.008	0.690	0.02	2.488	0.3	3.7

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
80.1	80	651.67	81	650.87	295.10	0.30%	27	0.011	0.522	2.300	0.40	12.317	4.2	17.9
81.1	81	650.87	1927	650.30	233.80	0.20%	27	0.011	0.557	2.270	0.34	11.681	4.8	15.2
82.1	82	663.40	81	650.87	92.60	13.50%	8	0.011	0.008	0.630	0.01	3.396	0.2	1.9
83.1	83	688.12	82	663.40	373.40	6.60%	8	0.011	0.006	0.650	0.67	2.375	0.3	100.0
84.1	84	689.87	83	688.12	500.90	0.30%	8	0.011	0.004	0.680	0.03	0.546	0.8	4.5
85.1	85	691.62	84	689.87	500.70	0.30%	8	0.011	0.002	0.610	0.02	0.546	0.4	2.8
86.1	86	693.00	85	691.62	389.10	0.40%	8	0.011	0.001	0.530	0.10	0.550	0.1	15.4
87.1	87	699.30	874	681.90	436.50	4.00%	8	0.011	0.003	0.570	0.01	1.843	0.2	1.4
88.1	88	700.95	87	699.30	390.30	0.40%	8	0.011	0.000	0.000	0.12	0.600	0.0	17.7
89.1	89	701.00	880	688.60	242.40	5.10%	8	0.011	0.000	0.000	0.00	2.088	0.0	0.0
90.1	90	705.70	91	680.30	328.80	7.70%	8	0.011	0.000	0.000	0.00	2.565	0.0	0.0
91.1	91	680.30	873	680.20	500.20	0.00%	8	0.011	0.002	0.260	0.05	0.131	1.6	7.6
92.1	92	702.44	93	686.30	440.30	3.70%	8	0.011	0.026	1.120	0.08	1.767	1.5	12.6
93.1	93	686.30	94	662.79	395.50	5.90%	8	0.011	0.051	1.320	0.67	2.250	2.3	100.0
94.4	94	662.79	862	661.88	206.30	0.40%	8	0.011	0.076	1.630	0.17	0.613	12.3	25.8
95.1	95	646.34	1256	645.68	278.90	0.20%	27	0.011	0.610	2.310	0.42	11.507	5.3	18.9
96.1	96	610.53	616	609.06	287.30	0.50%	8	0.011	0.040	1.340	0.27	0.660	6.0	40.9
97.1	97	612.22	96	610.53	158.90	1.10%	8	0.011	0.002	0.540	0.00	0.952	0.2	0.7
98.1	98	611.72	96	610.53	217.90	0.50%	8	0.011	0.037	1.180	0.13	0.682	5.4	19.5
99.1	99	613.71	98	611.72	377.00	0.50%	8	0.011	0.034	1.140	0.27	0.671	5.1	40.4
100.1	100	615.41	99	613.71	297.30	0.60%	8	0.011	0.032	1.110	0.29	0.698	4.6	44.1
101.1	101	620.83	100	615.41	323.50	1.70%	8	0.011	0.011	0.770	0.04	1.195	0.9	5.7
102.1	102	615.77	100	615.41	298.30	0.10%	8	0.011	0.018	0.650	0.12	0.321	5.7	18.1
103.1	103	616.36	102	615.77	451.40	0.10%	8	0.011	0.001	0.520	0.04	0.334	0.2	5.5
104.1	104	624.00	102	615.77	305.80	2.70%	8	0.011	0.014	0.800	0.04	1.514	0.9	5.7
105.1	105	633.04	104	624.00	309.80	2.90%	8	0.011	0.009	0.720	0.03	1.577	0.6	4.4
106.1	106	627.92	104	624.00	305.30	1.30%	8	0.011	0.001	0.530	0.00	1.046	0.1	0.7
107.1	107	639.00	105	633.04	226.20	2.60%	8	0.011	0.000	0.520	0.00	1.498	0.0	0.5
108.1	108	643.85	614	642.87	98.30	1.00%	8	0.011	0.000	0.520	0.00	0.921	0.0	0.5
109.1	109	744.16	110	735.13	447.50	2.00%	8	0.011	0.001	0.520	0.51	1.311	0.0	75.8
110.1	110	735.13	111	728.55	216.70	3.00%	8	0.011	0.003	0.560	0.01	1.608	0.2	1.2
111.1	111	728.55	112	721.77	229.60	3.00%	8	0.011	0.004	0.580	0.01	1.586	0.2	1.6
112.1	112	721.77	113	717.15	205.10	2.30%	8	0.011	0.005	0.620	0.02	1.385	0.3	2.7
113.1	113	717.15	114	715.96	218.10	0.50%	8	0.011	0.006	0.720	0.04	0.682	0.8	5.3
114.1	114	715.96	115	715.37	98.60	0.60%	8	0.011	0.007	0.700	0.03	0.714	0.9	4.5
115.1	115	715.37	116	714.67	119.40	0.60%	8	0.011	0.007	0.710	0.03	0.707	0.9	4.7
116.1	116	714.67	1650	711.15	327.40	1.10%	8	0.012	0.007	0.690	0.03	0.877	0.8	4.0
117.1	117	739.67	118	727.99	335.10	3.50%	8	0.011	0.000	0.200	0.00	1.723	0.0	0.4
118.1	118	727.99	119	720.49	289.50	2.60%	8	0.011	0.001	0.530	0.67	1.486	0.1	100.0
119.1	119	720.49	1004	709.38	330.20	3.40%	8	0.012	0.005	0.640	0.02	1.552	0.3	3.0

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
120.1	120	727.93	121	726.79	41.00	2.80%	8	0.011	0.000	0.200	0.00	1.539	0.0	0.4
121.1	121	726.79	119	720.49	344.40	1.80%	8	0.011	0.002	0.540	0.01	1.248	0.1	0.8
122.1	122	735.54	121	726.79	283.00	3.10%	8	0.011	0.000	0.390	0.67	1.623	0.0	100.0
123.1	123	673.19	2	672.16	227.70	0.50%	12	0.011	0.021	1.000	0.09	1.830	1.2	8.6
124.1	124	684.13	123	673.19	298.60	3.70%	12	0.011	0.021	0.950	0.06	5.208	0.4	5.7
125.1	125	692.09	124	684.13	239.70	3.30%	12	0.011	0.021	0.910	0.05	4.959	0.4	4.8
126.1	126	695.66	125	692.09	361.90	1.00%	12	0.011	0.000	0.000	0.26	2.703	0.0	25.5
127.1	127	697.50	126	695.66	368.20	0.50%	12	0.011	0.000	0.000	0.13	1.924	0.0	13.1
128.1	128	698.43	127	697.50	185.00	0.50%	12	0.011	0.000	0.000	0.00	1.929	0.0	0.0
129.1	129	700.76	128	698.43	446.10	0.50%	12	0.011	0.000	0.000	0.00	1.967	0.0	0.0
130.1	130	717.02	131	716.00	102.00	1.00%	6	0.011	0.000	0.000	0.00	0.429	0.0	0.0
131.1	131	716.00	132	715.52	47.90	1.00%	6	0.011	0.000	0.000	0.00	0.429	0.0	0.0
132.1	132	715.52	133	709.67	64.50	9.10%	6	0.011	0.000	0.000	0.00	1.290	0.0	0.0
133.1	133	709.67	135	706.84	214.90	1.30%	8	0.011	0.000	0.000	0.00	1.059	0.0	0.0
134.1	134	707.75	135	706.84	43.50	2.10%	6	0.011	0.000	0.000	0.00	0.620	0.0	0.0
135.1	135	706.84	129	700.76	470.60	1.30%	8	0.011	0.000	0.000	0.34	1.049	0.0	50.7
136.1	136	713.39	133	709.67	293.00	1.30%	8	0.011	0.000	0.000	0.37	1.040	0.0	55.8
137.1	137	716.11	136	713.39	99.70	2.70%	8	0.011	0.000	0.000	0.00	1.525	0.0	0.0
138.1	138	717.89	137	716.11	337.00	0.50%	8	0.011	0.000	0.000	0.00	0.671	0.0	0.0
139.1	139	719.03	138	717.89	208.00	0.50%	8	0.011	0.000	0.000	0.00	0.683	0.0	0.0
140.1	140	721.63	139	719.03	499.90	0.50%	8	0.011	0.000	0.000	0.00	0.666	0.0	0.0
141.1	141	722.22	140	721.63	49.40	1.20%	6	0.011	0.000	0.000	0.00	0.469	0.0	0.0
142.1	142	722.51	141	722.22	18.70	1.60%	6	0.011	0.000	0.000	0.00	0.534	0.0	0.0
143.1	143	723.12	142	722.51	12.20	5.00%	4	0.011	0.000	0.000	0.00	0.325	0.0	0.0
144.1	144	723.91	143	723.12	79.50	1.00%	4	0.011	0.000	0.000	0.00	0.145	0.0	0.0
145.1	145	704.04	127	697.50	262.80	2.50%	8	0.011	0.000	0.000	0.65	1.456	0.0	98.1
146.1	146	745.33	1136	740.04	499.20	1.10%	8	0.013	0.000	0.000	0.00	0.804	0.0	0.0
146.2	146	745.33	147	738.44	257.80	2.70%	8	0.011	0.001	0.520	0.67	1.509	0.0	100.0
147.1	147	738.44	1137	735.43	500.00	0.60%	8	0.013	0.002	0.540	0.01	0.606	0.3	0.8
148.1	148	738.72	147	738.44	59.70	0.50%	8	0.011	0.000	0.290	0.00	0.632	0.0	0.4
149.1	149	725.31	1138	724.06	61.50	2.00%	8	0.013	0.012	0.760	0.03	1.113	1.1	5.2
150.1	150	729.80	149	725.31	257.50	1.70%	8	0.013	0.005	0.670	0.48	1.031	0.5	71.3
151.1	151	748.88	157	745.99	555.00	0.50%	6	0.015	0.000	0.000	0.13	0.227	0.0	26.3
152.1	152	748.33	157	745.99	460.20	0.50%	6	0.015	0.000	0.000	0.13	0.224	0.0	26.0
153.1	153	746.01	159	743.41	502.90	0.50%	6	0.015	0.000	0.000	0.00	0.226	0.0	0.0
154.1	154	736.63	166	733.53	520.90	0.60%	6	0.015	0.013	0.850	0.05	0.242	5.4	9.8
155.1	155	740.50	154	736.63	649.10	0.60%	6	0.015	0.011	0.950	0.22	0.243	4.7	44.8
156.1	156	741.50	155	740.50	167.30	0.60%	6	0.015	0.009	0.770	0.04	0.243	3.6	8.1
157.1	157	745.99	158	745.23	124.20	0.60%	6	0.015	0.000	0.000	0.00	0.246	0.0	0.0
158.1	158	745.23	159	743.41	295.90	0.60%	6	0.015	0.000	0.000	0.18	0.247	0.0	36.4

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
159.1	159	743.41	553	742.47	154.10	0.60%	6	0.015	0.000	0.000	0.00	0.245	0.0	0.0
160.1	160	741.76	155	740.50	251.60	0.50%	6	0.015	0.001	0.530	0.13	0.222	0.4	26.0
161.1	161	734.74	166	733.53	305.70	0.40%	8	0.015	0.128	1.460	0.27	0.426	30.1	41.2
162.1	162	736.66	161	734.74	236.20	0.80%	6	0.015	0.009	0.890	0.07	0.283	3.1	13.1
163.1	163	740.03	162	736.66	163.60	2.10%	6	0.015	0.000	0.000	0.00	0.451	0.0	0.0
164.1	164	741.26	163	740.03	225.70	0.50%	6	0.015	0.000	0.000	0.00	0.232	0.0	0.0
165.1	165	738.68	162	736.66	386.60	0.50%	6	0.015	0.000	0.000	0.14	0.227	0.0	28.9
166.1	166	733.53	167	732.30	342.00	0.40%	8	0.015	0.147	1.490	0.30	0.406	36.1	45.0
167.1	167	732.30	168	726.49	108.70	5.30%	8	0.015	0.146	2.370	0.15	1.565	9.3	22.0
168.1	168	726.49	169	725.06	369.00	0.40%	8	0.015	0.149	1.540	0.40	0.421	35.3	59.7
169.1	169	725.06	2443	724.26	218.30	0.40%	8	0.015	0.152	1.530	0.30	0.410	37.1	45.4
170.1	170	732.20	169	725.06	233.20	3.10%	6	0.015	0.002	0.560	0.01	0.550	0.4	1.6
171.1	171	733.36	170	732.20	213.20	0.50%	6	0.015	0.000	0.000	0.00	0.232	0.0	0.0
172.1	172	723.21	173	722.34	169.30	0.50%	8	0.015	0.160	1.760	0.28	0.485	32.9	42.3
173.1	173	722.34	189	720.57	465.80	0.40%	8	0.015	0.161	1.570	0.41	0.417	38.5	61.1
174.1	174	744.50	172	723.21	576.10	3.70%	6	0.015	0.000	0.000	0.50	0.604	0.0	100.0
175.1	175	739.50	167	732.30	184.30	3.90%	6	0.015	0.000	0.000	0.00	0.621	0.0	0.0
176.1	176	735.00	171	733.36	293.30	0.60%	6	0.015	0.000	0.000	0.16	0.235	0.0	32.8
177.1	177	721.04	178	720.16	156.50	0.60%	6	0.015	0.000	0.000	0.00	0.236	0.0	0.0
178.1	178	720.16	179	718.03	405.60	0.50%	6	0.015	0.000	0.000	0.00	0.228	0.0	0.0
179.1	179	718.03	180	715.92	265.70	0.80%	6	0.015	0.000	0.000	0.21	0.280	0.0	42.2
180.1	180	715.92	190	715.74	302.60	0.10%	8	0.015	0.187	1.010	0.51	0.165	113.4	76.1
181.1	181	723.61	182	722.99	103.60	0.60%	6	0.015	0.000	0.000	0.00	0.243	0.0	0.0
182.1	182	722.99	183	722.65	47.80	0.70%	6	0.015	0.000	0.000	0.00	0.265	0.0	0.0
183.1	183	722.65	184	721.75	161.00	0.60%	6	0.015	0.000	0.000	0.00	0.235	0.0	0.0
184.1	184	721.75	186	721.48	33.80	0.80%	6	0.015	0.000	0.000	0.00	0.281	0.0	0.0
185.1	185	722.07	184	721.75	43.60	0.70%	6	0.015	0.000	0.000	0.00	0.269	0.0	0.0
186.1	186	721.48	189	720.57	162.10	0.60%	6	0.015	0.000	0.000	0.00	0.236	0.0	0.0
187.1	187	722.40	186	721.48	164.50	0.60%	6	0.015	0.000	0.000	0.00	0.235	0.0	0.0
188.1	188	723.34	187	722.40	168.90	0.60%	6	0.015	0.000	0.000	0.00	0.235	0.0	0.0
189.1	189	720.57	180	715.92	564.50	0.80%	8	0.015	0.170	2.110	0.47	0.614	27.7	70.4
190.1	190	715.74	191	714.93	194.60	0.40%	8	0.015	0.209	1.770	0.34	0.437	47.7	51.7
191.1	191	714.93	192	713.93	238.80	0.40%	8	0.015	0.220	1.810	0.35	0.438	50.3	53.0
192.1	192	713.93	193	712.60	336.10	0.40%	8	0.015	0.224	1.780	0.36	0.426	52.5	54.5
193.1	193	712.60	194	707.00	46.90	11.90%	8	0.015	0.222	2.940	0.14	2.339	9.5	21.7
194.1	194	707.00	2114	705.89	262.70	0.40%	12	0.015	0.266	1.890	0.43	1.297	20.5	43.2
195.1	195	704.50	197	691.90	277.30	4.50%	12	0.015	0.266	3.450	1.00	4.254	6.2	100.0
196.1	196	714.85	195	704.50	591.10	1.80%	10	0.015	0.001	0.530	0.48	1.624	0.1	57.0
197.1	197	691.90	230	682.00	431.70	2.30%	12	0.015	0.276	3.530	0.21	3.022	9.1	21.1
198.1	198	719.00	192	713.93	316.10	1.60%	6	0.015	0.001	0.520	0.00	0.398	0.1	0.7

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
199.1	199	709.26	194	707.00	438.70	0.50%	8	0.015	0.042	0.930	0.17	0.486	8.7	25.5
200.1	200	709.89	199	709.26	171.00	0.40%	8	0.015	0.041	0.880	0.17	0.411	10.0	26.1
201.1	201	722.90	200	709.89	472.30	2.80%	6	0.015	0.003	0.630	0.50	0.522	0.6	100.0
202.1	202	724.73	201	722.90	352.50	0.50%	6	0.015	0.000	0.000	0.13	0.227	0.0	26.1
203.1	203	729.19	190	715.74	670.20	2.00%	6	0.015	0.015	0.970	0.50	0.445	3.4	100.0
204.1	204	730.77	203	729.19	292.90	0.50%	6	0.015	0.001	0.530	0.16	0.231	0.4	32.4
205.1	205	737.31	203	729.19	142.80	5.70%	6	0.015	0.002	0.540	0.01	0.750	0.2	1.0
206.1	206	738.79	205	737.31	276.60	0.50%	6	0.015	0.000	0.000	0.15	0.230	0.0	29.6
207.1	207	723.98	201	722.90	197.00	0.50%	6	0.015	0.000	0.000	0.00	0.233	0.0	0.0
208.1	208	736.46	203	729.19	529.10	1.40%	6	0.015	0.008	0.810	0.05	0.368	2.3	9.8
209.1	209	738.99	208	736.46	506.60	0.50%	6	0.015	0.004	0.720	0.04	0.222	1.9	7.6
210.1	210	739.98	213	731.19	570.70	1.50%	6	0.015	0.010	0.820	0.45	0.390	2.4	89.7
211.1	211	740.66	210	739.98	177.30	0.40%	6	0.015	0.003	0.560	0.01	0.195	1.6	1.4
212.1	212	741.49	211	740.66	217.30	0.40%	6	0.015	0.003	0.550	0.01	0.194	1.6	1.2
213.1	213	731.19	214	723.19	497.50	1.60%	6	0.015	0.013	0.940	0.07	0.399	3.3	13.4
214.1	214	723.19	215	710.68	402.00	3.10%	6	0.015	0.016	0.910	0.06	0.554	2.8	11.8
215.1	215	710.68	200	709.89	173.70	0.50%	8	0.015	0.038	0.910	0.16	0.457	8.3	23.8
216.1	216	714.99	215	710.68	327.60	1.30%	8	0.015	0.020	1.080	0.09	0.776	2.6	12.8
217.1	217	716.49	216	714.99	300.70	0.50%	6	0.015	0.012	0.740	0.09	0.222	5.5	18.7
218.1	218	718.32	2366	717.37	189.70	0.50%	6	0.015	0.004	0.590	0.01	0.222	1.9	2.1
219.1	219	734.40	218	718.32	470.10	3.40%	6	0.015	0.002	0.540	0.50	0.581	0.3	100.0
220.1	220	723.94	221	722.83	201.10	0.60%	6	0.015	0.000	0.000	0.00	0.234	0.0	0.0
221.1	221	722.83	1975	721.50	246.80	0.50%	6	0.015	0.003	0.550	0.01	0.231	1.2	1.2
222.1	222	723.64	221	722.83	142.20	0.60%	6	0.015	0.000	0.000	0.00	0.237	0.0	0.0
223.1	223	720.15	2365	719.25	159.70	0.60%	6	0.015	0.004	0.590	0.01	0.236	1.7	2.5
224.1	224	720.98	223	720.15	145.60	0.60%	6	0.015	0.000	0.000	0.00	0.237	0.0	0.0
225.1	225	716.39	227	715.57	199.30	0.40%	8	0.015	0.004	0.570	0.01	0.434	0.8	1.3
226.1	226	717.22	225	716.39	145.10	0.60%	8	0.015	0.000	0.000	0.00	0.512	0.0	0.0
227.1	227	715.57	216	714.99	133.60	0.40%	8	0.015	0.004	0.610	0.02	0.446	0.8	2.4
228.1	228	743.30	212	741.49	622.10	0.30%	6	0.015	0.003	0.650	0.02	0.170	1.8	5.0
229.1	229	747.50	228	743.30	515.20	0.80%	6	0.015	0.001	0.530	0.00	0.284	0.3	0.9
230.1	230	682.00	231	674.50	441.50	1.70%	12	0.015	0.276	3.160	0.23	2.601	10.6	22.8
231.1	231	674.50	232	670.88	174.90	2.10%	12	0.015	0.277	3.400	0.22	2.871	9.6	21.7
232.1	232	670.88	2027	667.80	157.90	2.00%	12	0.015	0.277	3.440	0.16	2.787	9.9	16.0
233.1	233	668.26	2027	660.23	115.90	6.90%	12	0.015	0.005	0.600	0.01	5.252	0.1	1.2
234.1	234	658.45	1970	657.88	310.30	0.20%	18	0.015	0.640	1.820	0.52	2.522	25.4	34.7
235.1	235	657.00	2015	656.42	188.50	0.30%	18	0.013	0.643	2.410	0.43	3.766	17.1	28.4
236.1	236	657.17	235	657.00	37.40	0.50%	12	0.015	0.000	0.000	0.35	1.346	0.0	35.0
237.1	237	659.02	236	657.17	288.50	0.60%	12	0.015	0.000	0.000	0.19	1.598	0.0	18.5
238.1	238	659.51	2187	659.32	46.30	0.40%	8	0.015	0.000	0.000	0.00	0.434	0.0	0.0

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
239.1	239	697.70	197	691.90	207.30	2.80%	6	0.015	0.010	0.780	0.04	0.526	1.9	8.1
240.1	240	704.75	2406	704.65	204.90	0.00%	6	0.015	0.009	0.850	0.06	0.069	12.3	11.2
241.1	241	705.55	240	704.75	266.30	0.30%	6	0.015	0.000	0.000	0.08	0.172	0.0	16.0
242.1	242	707.55	241	705.55	409.40	0.50%	6	0.015	0.000	0.000	0.00	0.220	0.0	0.0
243.1	243	711.60	244	710.49	200.50	0.60%	6	0.015	0.001	0.520	0.00	0.234	0.2	0.7
244.1	244	710.49	245	709.76	123.40	0.60%	6	0.015	0.002	0.540	0.00	0.242	0.6	1.0
245.1	245	709.76	251	708.48	167.40	0.80%	8	0.015	0.011	0.830	0.05	0.592	1.8	7.3
246.1	246	711.15	245	709.76	160.40	0.90%	8	0.015	0.008	0.750	0.04	0.630	1.3	5.5
247.1	247	714.95	246	711.15	349.30	1.10%	6	0.015	0.007	0.740	0.31	0.328	2.0	61.9
248.1	248	724.50	247	714.95	326.70	2.90%	6	0.015	0.005	0.670	0.03	0.537	0.8	5.2
249.1	249	736.98	2198	736.11	152.20	0.60%	6	0.015	0.004	0.590	0.01	0.238	1.5	2.5
250.1	250	741.68	249	736.98	363.40	1.30%	6	0.015	0.001	0.520	0.34	0.357	0.2	67.9
251.1	251	708.48	260	705.68	330.80	0.80%	8	0.015	0.091	1.670	0.19	0.623	14.7	29.1
252.1	252	715.49	251	708.48	367.20	1.90%	8	0.015	0.079	1.850	0.65	0.935	8.4	97.3
253.1	253	727.00	252	715.49	333.80	3.40%	8	0.015	0.077	1.740	0.13	1.257	6.1	19.3
254.1	254	727.00	253	727.00	264.80	0.00%	8	0.015	0.075	0.550	0.39	0.000	Infinity	58.3
255.1	255	732.91	254	727.00	173.80	3.40%	8	0.015	0.041	0.570	0.24	1.248	3.3	35.4
256.1	256	733.65	255	732.91	355.20	0.20%	8	0.015	0.016	0.600	0.17	0.309	5.2	25.4
257.1	257	734.49	256	733.65	147.60	0.60%	6	0.015	0.001	0.530	0.00	0.237	0.3	0.8
258.1	258	709.25	259	705.40	275.00	1.40%	6	0.015	0.000	0.000	0.39	0.372	0.0	77.0
259.1	259	705.40	273	700.76	485.70	1.00%	6	0.015	0.002	0.300	0.30	0.307	0.5	60.1
260.1	260	705.68	272	703.10	310.90	0.80%	8	0.015	0.099	1.730	0.20	0.617	16.0	30.0
261.1	261	710.00	272	703.10	350.80	2.00%	8	0.015	0.004	0.230	0.57	0.949	0.4	86.0
262.1	262	725.97	261	710.00	354.00	4.50%	8	0.015	0.002	0.540	0.67	1.438	0.1	100.0
263.1	263	743.75	264	736.02	524.60	1.50%	6	0.015	0.001	0.520	0.00	0.382	0.2	0.7
264.1	264	736.02	256	733.65	241.40	1.00%	6	0.015	0.014	1.000	0.08	0.311	4.6	15.7
265.1	265	739.11	264	736.02	335.00	0.90%	6	0.015	0.010	0.860	0.06	0.302	3.4	11.4
266.1	266	740.73	265	739.11	146.30	1.10%	6	0.015	0.007	0.770	0.04	0.331	2.2	8.3
267.1	267	742.01	266	740.73	113.00	1.10%	6	0.015	0.006	0.720	0.04	0.334	1.8	7.1
268.1	268	748.12	267	742.01	500.70	1.20%	6	0.015	0.004	0.680	0.03	0.347	1.2	5.9
269.1	269	749.28	268	748.12	211.40	0.50%	6	0.015	0.003	0.560	0.01	0.233	1.5	1.3
270.1	270	749.60	269	749.28	43.30	0.70%	6	0.015	0.000	0.000	0.00	0.270	0.0	0.0
271.1	271	750.94	269	749.28	311.30	0.50%	6	0.015	0.002	0.540	0.00	0.230	0.7	1.0
272.1	272	703.10	273	700.76	287.50	0.80%	8	0.015	0.104	1.750	0.44	0.611	17.1	66.0
273.1	273	700.76	333	697.30	356.20	1.00%	8	0.015	0.110	1.870	0.45	0.667	16.5	67.9
274.1	274	718.31	260	705.68	366.00	3.50%	8	0.015	0.004	0.660	0.67	1.257	0.3	100.0
275.1	275	726.65	274	718.31	332.40	2.50%	8	0.015	0.002	0.540	0.01	1.072	0.2	0.8
276.1	276	742.43	267	742.01	64.00	0.70%	6	0.015	0.000	0.000	0.00	0.255	0.0	0.0
277.1	277	742.30	266	740.73	294.90	0.50%	4	0.015	0.000	0.000	0.16	0.078	0.0	47.1
278.1	278	739.78	2110	739.45	23.20	1.40%	10	0.013	0.043	1.400	0.11	1.687	2.6	13.5

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
279.1	279	742.13	278	739.78	281.70	0.80%	8	0.013	0.000	0.430	0.24	0.713	0.0	35.7
280.1	280	743.36	556	740.60	265.80	1.00%	6	0.015	0.001	0.540	0.28	0.320	0.4	56.2
281.1	281	742.20	556	740.60	243.40	0.70%	10	0.013	0.039	1.110	0.13	1.148	3.4	15.6
282.1	282	743.67	298	743.18	135.80	0.40%	6	0.015	0.017	0.810	0.11	0.189	8.9	22.0
283.1	283	745.27	282	743.67	238.90	0.70%	6	0.015	0.017	1.050	0.08	0.257	6.6	16.7
284.1	284	746.03	283	745.27	122.10	0.60%	6	0.015	0.017	1.040	0.09	0.248	6.8	18.6
285.1	285	747.83	2111	746.57	203.20	0.60%	6	0.015	0.017	1.060	0.09	0.248	6.8	17.0
286.1	286	744.24	1972	743.26	244.20	0.40%	8	0.013	0.001	0.520	0.00	0.495	0.1	0.5
287.1	287	745.00	288	744.26	156.20	0.50%	8	0.013	0.001	0.520	0.00	0.538	0.1	0.5
288.1	288	744.26	1972	743.26	249.50	0.40%	8	0.013	0.018	0.750	0.21	0.494	3.6	31.1
289.1	289	749.33	288	744.26	334.30	1.50%	8	0.013	0.015	0.890	0.05	0.962	1.6	8.2
290.1	290	754.35	291	751.78	260.50	1.00%	8	0.013	0.013	0.900	0.32	0.776	1.7	47.5
291.1	291	751.78	289	749.33	248.90	1.00%	8	0.013	0.015	0.940	0.31	0.775	1.9	46.6
292.1	292	757.41	290	754.35	309.60	1.00%	6	0.015	0.013	0.970	0.07	0.312	4.1	14.7
293.1	293	758.48	292	757.41	189.20	0.60%	6	0.015	0.009	0.760	0.04	0.236	3.7	7.6
294.1	294	759.94	297	759.03	182.10	0.50%	6	0.015	0.000	0.310	0.00	0.222	0.1	0.5
295.1	295	760.93	297	759.03	146.40	1.30%	6	0.015	0.002	0.540	0.00	0.358	0.5	1.0
296.1	296	764.31	295	760.93	252.10	1.30%	6	0.015	0.001	0.520	0.34	0.364	0.2	68.3
297.1	297	759.03	1973	758.49	331.70	0.20%	6	0.015	0.002	0.630	0.02	0.127	1.8	4.4
298.1	298	743.18	281	742.20	243.90	0.40%	8	0.013	0.018	0.890	0.09	0.495	3.5	14.2
299.1	299	749.72	285	747.83	252.00	0.70%	6	0.015	0.017	0.860	0.29	0.272	6.2	58.9
300.1	300	751.74	299	749.72	232.00	0.90%	6	0.015	0.017	1.080	0.09	0.293	5.8	17.9
301.1	301	755.36	300	751.80	712.00	0.50%	6	0.015	0.000	0.000	0.00	0.222	0.0	0.0
302.1	302	753.30	300	751.74	190.10	0.80%	6	0.015	0.011	0.890	0.06	0.285	3.7	12.2
303.1	303	754.32	302	753.30	163.20	0.60%	6	0.015	0.002	0.540	0.01	0.249	0.7	1.0
304.1	304	755.74	303	754.32	263.50	0.50%	6	0.015	0.002	0.540	0.15	0.231	0.8	29.4
305.1	305	741.91	306	739.80	421.50	0.50%	6	0.015	0.001	0.520	0.00	0.222	0.3	0.8
306.1	306	739.70	313	738.00	319.70	0.50%	6	0.015	0.003	0.710	0.04	0.229	1.3	7.3
307.1	307	750.80	306	739.70	120.60	9.20%	6	0.015	0.000	0.000	0.00	0.954	0.0	0.0
308.1	308	738.55	309	737.86	117.20	0.60%	6	0.015	0.000	0.000	0.00	0.241	0.0	0.0
309.1	309	737.86	311	733.94	484.30	0.80%	6	0.015	0.004	0.580	0.23	0.283	1.3	45.8
310.1	310	739.04	323	738.35	117.70	0.60%	6	0.015	0.000	0.000	0.00	0.241	0.0	0.0
311.1	311	733.94	329	724.10	244.60	4.00%	6	0.015	0.034	1.270	0.10	0.630	5.5	20.1
312.1	312	736.00	311	733.94	187.30	1.10%	6	0.015	0.030	1.080	0.13	0.330	9.0	26.9
313.1	313	738.00	312	736.00	57.00	3.50%	6	0.015	0.029	1.220	0.10	0.589	5.0	19.9
314.1	314	741.43	313	738.00	145.80	2.40%	6	0.015	0.026	1.200	0.10	0.482	5.3	20.1
315.1	315	742.63	314	741.43	221.20	0.50%	6	0.013	0.000	0.000	0.00	0.267	0.0	0.0
316.1	316	742.47	2364	742.40	13.90	0.50%	6	0.015	0.024	1.000	0.12	0.223	10.7	24.3
317.1	317	768.00	320	757.47	60.90	17.30%	6	0.013	0.002	0.540	0.01	1.507	0.1	1.1
318.1	318	769.36	317	768.00	257.10	0.50%	6	0.013	0.002	0.620	0.16	0.264	0.7	31.5

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
319.1	319	769.92	317	768.00	163.90	1.20%	8	0.013	0.000	0.000	0.00	0.845	0.0	0.0
320.1	320	757.47	322	757.47	183.10	0.00%	6	0.013	0.014	0.230	0.23	0.000	Infinity	46.8
321.1	321	770.16	319	769.92	227.20	0.10%	6	0.015	0.000	0.000	0.00	0.102	0.0	0.0
322.1	322	757.47	316	742.47	468.80	3.20%	6	0.013	0.015	0.910	0.50	0.649	2.3	100.0
323.1	323	738.35	309	737.86	78.50	0.60%	6	0.015	0.002	0.580	0.01	0.248	0.9	2.6
324.1	324	726.86	325	725.87	177.50	0.60%	6	0.015	0.001	0.530	0.00	0.235	0.4	0.8
325.1	325	725.87	329	724.10	200.30	0.90%	6	0.015	0.005	0.210	0.12	0.295	1.7	23.8
326.1	326	727.19	325	725.87	244.60	0.50%	6	0.015	0.002	0.560	0.01	0.231	0.9	1.6
327.1	327	727.84	326	727.19	110.80	0.60%	6	0.015	0.001	0.530	0.00	0.241	0.5	0.9
328.1	328	728.29	327	727.84	69.50	0.60%	6	0.015	0.001	0.530	0.00	0.253	0.4	0.8
329.1	329	724.10	330	721.42	711.10	0.40%	6	0.015	0.042	0.890	0.20	0.193	21.8	39.9
330.1	330	721.42	2060	721.26	12.00	1.30%	6	0.015	0.043	1.410	0.14	0.364	11.7	28.6
331.1	331	710.76	332	705.13	321.60	1.80%	6	0.015	0.045	1.530	0.14	0.416	10.7	27.2
332.1	332	705.13	333	697.30	265.70	2.90%	6	0.015	0.047	1.470	0.50	0.540	8.6	100.0
333.1	333	697.30	2125	697.05	75.00	0.30%	8	0.015	0.162	1.560	0.31	0.391	41.5	46.9
335.1	335	697.04	1971	696.03	269.00	0.40%	8	0.015	0.008	0.630	0.17	0.415	1.8	25.1
336.1	336	697.88	335	697.04	217.50	0.40%	8	0.015	0.000	0.450	0.00	0.421	0.1	0.5
337.1	337	707.55	347	706.19	308.30	0.40%	8	0.015	0.005	0.710	0.05	0.450	1.1	7.1
338.1	338	709.20	337	707.55	455.90	0.40%	8	0.015	0.005	0.760	0.13	0.407	1.2	20.2
339.1	339	729.95	338	709.20	482.00	4.30%	8	0.015	0.005	0.640	0.67	1.404	0.4	100.0
340.1	340	731.32	339	729.95	380.20	0.40%	8	0.015	0.001	0.530	0.10	0.406	0.3	15.4
341.1	341	731.91	340	731.32	144.80	0.40%	8	0.015	0.000	0.000	0.00	0.432	0.0	0.0
342.1	342	730.53	339	729.95	116.00	0.50%	6	0.015	0.000	0.000	0.00	0.222	0.0	0.0
343.1	343	737.44	312	736.00	185.30	0.80%	6	0.015	0.000	0.000	0.00	0.277	0.0	0.0
344.1	344	696.05	334	695.20	299.30	0.30%	10	0.015	0.165	1.410	0.31	0.654	25.2	36.7
345.1	345	699.80	335	697.04	531.90	0.50%	6	0.015	0.000	0.000	0.00	0.226	0.0	0.0
346.1	346	698.52	334	695.20	312.60	1.10%	8	0.015	0.126	2.080	0.21	0.698	18.1	31.3
347.1	347	706.19	2124	705.59	60.00	1.00%	8	0.015	0.101	1.870	0.19	0.677	15.0	29.0
348.1	348	710.86	347	706.19	469.50	1.00%	8	0.015	0.087	1.750	0.44	0.675	12.9	66.2
349.1	349	711.19	348	710.86	45.40	0.70%	6	0.015	0.000	0.000	0.02	0.268	0.0	3.9
350.1	350	712.18	349	711.19	177.40	0.60%	6	0.015	0.000	0.000	0.00	0.235	0.0	0.0
351.1	351	707.50	352	701.65	576.60	1.00%	6	0.015	0.000	0.000	0.27	0.317	0.0	53.2
352.1	352	701.65	346	698.52	335.60	0.90%	6	0.015	0.014	0.660	0.01	0.304	4.7	1.9
353.1	353	704.86	352	701.65	340.70	0.90%	6	0.015	0.010	0.860	0.06	0.305	3.1	11.6
354.1	354	709.90	353	704.86	577.80	0.90%	6	0.015	0.000	0.000	0.23	0.294	0.0	45.8
355.1	355	697.98	356	696.75	216.90	0.60%	6	0.015	0.005	0.590	0.01	0.237	2.0	2.1
356.1	356	696.75	357	691.45	358.80	1.50%	6	0.015	0.007	0.740	0.42	0.382	1.9	83.2
357.1	357	691.45	376	689.53	401.30	0.50%	6	0.015	0.020	0.680	0.14	0.217	9.0	27.6
358.1	358	693.13	357	691.45	321.60	0.50%	6	0.015	0.010	0.790	0.08	0.227	4.5	15.7
359.1	359	695.37	358	693.13	449.70	0.50%	6	0.015	0.008	0.880	0.19	0.222	3.8	37.5

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
360.1	360	699.80	359	695.37	361.10	1.20%	6	0.015	0.003	0.620	0.34	0.348	0.9	67.1
361.1	361	701.25	362	699.65	311.80	0.50%	6	0.015	0.000	0.000	0.00	0.225	0.0	0.0
362.1	362	699.65	355	697.98	315.30	0.50%	6	0.015	0.002	0.670	0.03	0.229	1.0	6.2
363.1	363	702.17	360	699.80	453.00	0.50%	6	0.015	0.000	0.000	0.13	0.227	0.0	26.3
364.1	364	711.75	365	706.80	574.20	0.90%	6	0.015	0.000	0.000	0.23	0.292	0.0	45.0
365.1	365	706.80	353	704.86	337.30	0.60%	6	0.015	0.005	0.700	0.06	0.238	2.3	11.1
366.1	366	714.02	365	706.80	183.30	3.90%	6	0.015	0.001	0.530	0.00	0.624	0.2	1.0
367.1	367	715.47	366	714.02	270.30	0.50%	6	0.015	0.000	0.000	0.15	0.230	0.0	29.0
368.1	368	713.41	1298	713.02	85.40	0.50%	8	0.015	0.026	0.750	0.14	0.457	5.8	21.3
369.1	369	714.27	374	713.84	93.60	0.50%	8	0.015	0.025	0.770	0.14	0.459	5.5	20.3
370.1	370	716.36	369	714.27	114.60	1.80%	8	0.015	0.018	0.950	0.06	0.914	2.0	9.4
371.1	371	718.97	370	716.36	149.00	1.80%	8	0.015	0.018	0.960	0.06	0.896	2.0	9.5
372.1	372	722.61	373	719.66	515.00	0.60%	8	0.015	0.008	0.820	0.05	0.512	1.5	8.0
373.1	373	719.66	371	718.97	124.70	0.60%	8	0.015	0.012	0.870	0.06	0.504	2.3	8.5
374.1	374	713.84	554	713.61	50.60	0.50%	8	0.015	0.025	0.730	0.14	0.456	5.5	20.9
375.1	375	692.37	376	689.53	411.30	0.70%	10	0.015	0.301	2.390	0.32	1.020	29.5	38.7
376.1	376	689.53	378	685.91	132.20	2.70%	12	0.015	0.326	3.970	0.22	3.302	9.9	21.8
377.1	377	695.23	376	689.53	453.20	1.30%	6	0.015	0.002	0.540	0.32	0.353	0.5	64.4
378.1	378	685.91	379	684.27	204.40	0.80%	12	0.015	0.331	2.560	0.30	1.788	18.5	30.2
379.1	379	684.27	2025	682.06	275.60	0.80%	12	0.015	0.331	2.560	0.52	1.787	18.5	52.3
380.1	380	671.70	381	670.19	413.50	0.40%	8	0.015	0.000	0.000	0.00	0.409	0.0	0.0
381.1	381	670.19	233	668.26	539.10	0.40%	8	0.015	0.003	0.660	0.03	0.405	0.6	4.2
382.1	382	649.00	384	648.35	129.30	0.50%	8	0.012	0.114	1.790	0.22	0.600	18.9	32.4
383.1	383	655.60	382	649.00	122.70	5.40%	8	0.012	0.030	1.110	0.08	1.962	1.5	11.4
384.1	384	648.35	385	647.46	178.50	0.50%	8	0.012	0.115	1.800	0.22	0.597	19.2	32.5
385.1	385	647.46	LS_TP1	647.41	15.80	0.30%	8	0.012	0.116	1.810	0.08	0.493	23.6	12.2
386.1	386	658.90	383	655.60	405.70	0.80%	8	0.012	0.026	1.170	0.10	0.763	3.4	15.5
387.1	387	663.30	386	658.90	489.50	0.90%	8	0.012	0.022	1.120	0.33	0.802	2.8	50.2
388.1	388	665.59	387	663.30	254.70	0.90%	8	0.012	0.000	0.000	0.23	0.802	0.0	34.4
389.1	389	655.50	382	649.00	340.70	1.90%	8	0.012	0.040	1.340	0.11	1.169	3.4	16.0
390.1	390	656.21	389	655.50	141.20	0.50%	8	0.012	0.001	0.530	0.00	0.600	0.2	0.7
391.1	391	657.40	389	655.50	380.70	0.50%	8	0.012	0.002	0.540	0.14	0.598	0.3	21.1
392.1	392	659.27	389	655.50	289.80	1.30%	8	0.012	0.033	1.300	0.49	0.965	3.4	73.0
393.1	393	662.46	392	659.27	290.10	1.10%	8	0.012	0.006	0.660	0.34	0.887	0.7	51.3
394.1	394	664.54	393	662.46	174.60	1.20%	8	0.012	0.002	0.540	0.01	0.924	0.2	0.8
395.1	395	661.39	392	659.27	265.50	0.80%	8	0.012	0.023	1.120	0.31	0.756	3.0	46.4
396.1	396	662.20	395	661.39	150.30	0.50%	8	0.012	0.022	1.020	0.10	0.621	3.5	15.0
397.1	397	663.70	396	662.20	114.50	1.30%	8	0.012	0.022	1.020	0.07	0.968	2.2	10.6
398.1	398	664.86	397	663.70	219.00	0.50%	8	0.012	0.002	0.540	0.00	0.616	0.2	0.7
399.1	399	665.34	398	664.86	96.50	0.50%	8	0.012	0.001	0.530	0.00	0.597	0.1	0.6

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
400.1	400	664.64	397	663.70	312.80	0.30%	8	0.012	0.002	0.650	0.03	0.464	0.5	3.9
401.1	401	665.22	397	663.70	284.20	0.50%	8	0.012	0.013	0.940	0.22	0.619	2.1	33.0
402.1	402	666.70	401	665.22	298.80	0.50%	8	0.012	0.001	0.530	0.00	0.596	0.2	0.7
403.1	403	666.69	401	665.22	296.60	0.50%	8	0.012	0.009	0.820	0.20	0.596	1.5	29.7
404.1	404	667.92	403	666.69	245.50	0.50%	8	0.012	0.004	0.650	0.02	0.599	0.7	3.4
405.1	405	668.98	404	667.92	104.70	1.00%	8	0.012	0.003	0.590	0.01	0.851	0.4	1.9
406.1	406	670.70	405	668.98	349.20	0.50%	8	0.012	0.001	0.520	0.13	0.594	0.1	19.0
407.1	407	669.70	403	666.69	442.10	0.70%	8	0.012	0.001	0.520	0.00	0.698	0.1	0.5
408.1	408	666.50	387	663.30	292.70	1.10%	8	0.012	0.020	1.040	0.40	0.885	2.2	59.6
409.1	409	668.64	408	666.50	193.80	1.10%	8	0.012	0.005	0.640	0.02	0.889	0.6	2.9
410.1	410	671.08	409	668.64	154.80	1.60%	8	0.012	0.004	0.590	0.01	1.062	0.4	1.8
411.1	411	671.25	410	671.08	223.60	0.10%	8	0.012	0.003	0.650	0.03	0.233	1.1	3.9
412.1	412	672.50	411	671.25	256.10	0.50%	8	0.012	0.000	0.000	0.13	0.591	0.0	18.8
413.1	413	674.03	408	666.50	503.00	1.50%	8	0.012	0.009	0.700	0.03	1.035	0.9	4.0
414.1	414	676.37	413	674.03	232.50	1.00%	8	0.012	0.007	0.680	0.03	0.849	0.8	3.8
415.1	415	678.92	414	676.37	179.90	1.40%	8	0.012	0.005	0.620	0.02	1.007	0.5	2.5
416.1	416	683.72	415	678.92	550.80	0.90%	8	0.012	0.001	0.530	0.22	0.790	0.1	33.3
417.1	417	646.15	1929	646.07	179.70	0.00%	18	0.011	1.027	2.280	0.62	1.693	60.6	41.6
418.1	418	648.71	417	646.15	221.00	1.20%	21	0.011	0.861	3.370	0.39	13.025	6.6	22.1
419.1	419	649.70	418	648.71	197.30	0.50%	21	0.011	0.857	3.450	0.38	8.572	10.0	21.7
420.1	420	652.80	419	649.70	294.00	1.10%	6	0.012	0.007	0.770	0.35	0.403	1.8	70.5
421.1	421	655.48	420	652.80	363.40	0.70%	6	0.012	0.004	0.660	0.22	0.337	1.2	43.5
422.1	422	657.91	421	655.48	369.30	0.70%	6	0.012	0.001	0.530	0.18	0.319	0.4	35.6
423.1	423	647.98	417	646.15	261.50	0.70%	8	0.012	0.157	2.070	0.43	0.708	22.2	64.5
424.1	424	649.88	423	647.98	381.90	0.50%	8	0.012	0.154	2.010	0.38	0.597	25.8	57.6
425.1	425	651.91	424	649.88	396.00	0.50%	8	0.012	0.151	2.020	0.39	0.606	24.9	58.4
426.1	426	658.00	425	651.91	218.20	2.80%	6	0.012	0.000	0.000	0.00	0.656	0.0	0.0
427.1	427	653.12	861	652.16	194.40	0.50%	8	0.012	0.149	1.980	0.24	0.595	25.0	36.6
428.1	428	652.29	2363	650.81	177.40	0.80%	21	0.011	0.841	4.130	0.33	11.055	7.6	18.9
429.1	429	653.63	428	652.29	159.80	0.80%	21	0.011	0.782	4.040	0.32	11.081	7.1	18.2
430.1	430	656.17	429	653.63	487.60	0.50%	21	0.011	0.773	3.400	0.50	8.735	8.9	28.5
431.1	431	657.77	430	656.17	299.70	0.50%	21	0.011	0.767	3.420	0.35	8.842	8.7	20.2
432.1	432	660.27	431	657.77	459.00	0.50%	21	0.011	0.756	3.430	0.49	8.931	8.5	27.9
433.1	433	661.23	432	660.27	172.20	0.60%	21	0.011	0.752	3.430	0.35	9.037	8.3	19.8
434.1	434	653.28	428	652.29	147.10	0.70%	8	0.012	0.053	1.240	0.16	0.694	7.6	24.3
435.1	435	654.70	434	653.28	213.70	0.70%	8	0.012	0.051	1.390	0.15	0.690	7.4	22.0
436.1	436	656.20	435	654.70	300.90	0.50%	8	0.012	0.019	1.080	0.09	0.597	3.2	12.9
437.1	437	656.70	436	656.20	73.00	0.70%	6	0.012	0.011	0.910	0.06	0.325	3.4	13.0
438.1	438	659.14	437	656.70	426.20	0.60%	6	0.012	0.007	0.770	0.04	0.297	2.3	8.6
439.1	439	660.34	438	659.14	247.20	0.50%	6	0.012	0.005	0.640	0.02	0.274	1.8	4.1

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
440.1	440	661.45	439	660.34	216.30	0.50%	6	0.012	0.003	0.610	0.02	0.281	1.1	3.3
441.1	441	664.03	440	661.45	309.20	0.80%	6	0.012	0.001	0.520	0.00	0.359	0.2	0.7
442.1	442	658.35	436	656.20	173.00	1.20%	6	0.012	0.007	0.720	0.03	0.438	1.6	6.6
443.1	443	662.00	442	658.35	549.50	0.70%	6	0.012	0.002	0.540	0.17	0.320	0.6	34.2
444.1	444	659.20	442	658.35	220.50	0.40%	6	0.012	0.000	0.520	0.00	0.244	0.2	0.7
445.1	445	656.58	435	654.70	174.40	1.10%	8	0.012	0.032	1.300	0.11	0.879	3.7	16.5
446.1	446	658.32	445	656.58	348.00	0.50%	8	0.012	0.028	0.910	0.25	0.598	4.7	38.1
447.1	447	660.65	446	658.32	480.00	0.50%	8	0.012	0.024	0.890	0.25	0.590	4.1	37.2
448.1	448	663.00	447	660.65	382.30	0.60%	8	0.012	0.021	1.080	0.26	0.663	3.1	39.2
449.1	449	665.31	448	663.00	412.20	0.60%	8	0.012	0.015	1.000	0.08	0.633	2.4	11.4
450.1	450	665.31	449	665.31	103.90	0.00%	8	0.012	0.015	0.290	0.19	0.000	Infinity	28.4
451.1	451	666.45	450	665.31	100.10	1.10%	6	0.012	0.002	0.540	0.00	0.419	0.4	1.0
452.1	452	667.17	451	666.45	146.10	0.50%	6	0.012	0.000	0.000	0.00	0.276	0.0	0.0
453.1	453	666.79	2078	666.37	332.70	0.10%	21	0.011	0.723	2.070	0.48	4.300	16.8	27.6
454.1	454	671.98	455	671.17	140.30	0.60%	8	0.012	0.000	0.000	0.00	0.643	0.0	0.0
455.1	455	671.17	456	668.59	435.90	0.60%	8	0.012	0.003	0.620	0.02	0.651	0.5	2.9
456.1	456	668.59	457	667.14	242.60	0.60%	8	0.012	0.008	0.740	0.04	0.654	1.2	5.5
457.1	457	667.14	450	665.31	199.50	0.90%	8	0.012	0.012	0.610	0.10	0.810	1.5	14.5
458.1	458	680.85	2127	680.27	80.00	0.70%	8	0.011	0.059	1.630	0.14	0.786	7.5	21.7
459.1	459	661.85	460	660.69	292.30	0.40%	8	0.012	0.097	1.560	0.33	0.533	18.2	49.3
460.1	460	660.69	464	660.30	202.30	0.20%	8	0.012	0.105	1.230	0.27	0.372	28.2	40.3
461.1	461	663.41	460	660.69	544.10	0.50%	8	0.012	0.001	0.530	0.00	0.598	0.2	0.7
462.1	462	659.86	465	658.77	219.00	0.50%	8	0.012	0.112	1.780	0.21	0.597	18.7	32.1
463.1	463	662.10	462	659.86	515.10	0.40%	8	0.012	0.001	0.530	0.00	0.558	0.2	0.7
464.1	464	660.30	462	659.86	85.90	0.50%	8	0.012	0.105	1.750	0.21	0.605	17.4	31.2
465.1	465	658.77	466	658.27	99.30	0.50%	8	0.012	0.112	1.780	0.21	0.600	18.6	32.2
466.1	466	658.27	467	656.89	343.50	0.40%	8	0.012	0.113	1.640	0.23	0.536	21.1	34.4
467.1	467	656.89	1202	656.13	196.80	0.40%	8	0.012	0.116	1.660	0.23	0.526	22.1	34.8
468.1	468	662.83	459	661.85	242.80	0.40%	8	0.012	0.070	1.410	0.18	0.538	13.0	27.1
469.1	469	671.89	1223	665.37	634.70	1.00%	8	0.012	0.001	0.530	0.00	0.858	0.2	0.7
470.1	470	666.83	468	662.83	409.20	1.00%	8	0.012	0.046	1.480	0.13	0.837	5.5	18.8
471.1	471	669.96	470	666.83	214.10	1.50%	8	0.012	0.044	1.400	0.11	1.023	4.3	16.7
472.1	472	672.82	471	669.96	238.40	1.20%	8	0.012	0.042	1.410	0.12	0.927	4.6	17.4
473.1	473	675.32	472	672.82	451.60	0.60%	8	0.012	0.034	1.060	0.27	0.630	5.4	40.7
474.1	474	680.41	473	675.32	510.90	1.00%	8	0.012	0.002	0.550	0.01	0.845	0.3	0.9
475.1	475	719.96	476	716.53	666.30	0.50%	6	0.015	0.001	0.520	0.14	0.226	0.3	27.2
476.1	476	716.53	369	714.27	435.00	0.50%	6	0.015	0.004	0.710	0.03	0.227	1.9	7.0
477.1	477	723.81	371	718.97	275.60	1.80%	6	0.015	0.005	0.700	0.50	0.417	1.2	100.0
478.1	478	732.32	477	723.81	485.60	1.80%	6	0.015	0.003	0.640	0.50	0.416	0.8	99.3
479.1	479	736.56	478	732.32	469.60	0.90%	6	0.015	0.002	0.540	0.24	0.299	0.5	48.1

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
480.1	480	742.67	479	736.56	402.50	1.50%	6	0.015	0.000	0.320	0.00	0.387	0.1	0.5
481.1	481	725.78	482	724.45	266.00	0.50%	8	0.015	0.006	0.700	0.19	0.479	1.3	28.3
482.1	482	724.45	372	722.61	368.70	0.50%	8	0.015	0.006	0.720	0.17	0.478	1.3	24.9
483.1	483	726.74	481	725.78	171.70	0.60%	6	0.015	0.003	0.590	0.01	0.235	1.3	2.6
484.1	484	728.60	483	726.74	372.40	0.50%	6	0.015	0.001	0.520	0.14	0.222	0.2	27.3
485.1	485	729.49	486	726.86	506.90	0.50%	6	0.015	0.001	0.520	0.00	0.226	0.2	0.7
486.1	486	726.86	481	725.78	195.30	0.60%	8	0.015	0.003	0.570	0.01	0.503	0.6	1.2
487.1	487	761.54	488	760.16	376.80	0.40%	8	0.012	0.000	0.490	0.10	0.512	0.1	15.3
488.1	488	760.16	489	759.42	187.90	0.40%	8	0.012	0.001	0.530	0.00	0.531	0.3	0.7
489.1	489	759.42	490	758.65	198.20	0.40%	8	0.012	0.002	0.540	0.01	0.527	0.4	0.8
490.1	490	758.65	491	757.46	321.60	0.40%	8	0.012	0.002	0.640	0.02	0.515	0.5	3.6
491.1	491	757.46	494	756.75	179.60	0.40%	8	0.012	0.003	0.600	0.01	0.532	0.6	2.2
492.1	492	758.13	491	757.46	166.70	0.40%	8	0.012	0.000	0.490	0.00	0.536	0.1	0.5
493.1	493	758.63	492	758.13	117.40	0.40%	8	0.012	0.000	0.190	0.00	0.552	0.0	0.4
494.1	494	756.75	495	756.08	166.80	0.40%	8	0.012	0.004	0.660	0.03	0.536	0.7	3.8
495.1	495	756.08	496	755.49	143.20	0.40%	8	0.012	0.008	0.760	0.04	0.543	1.4	6.0
496.1	496	755.49	497	754.63	223.00	0.40%	8	0.012	0.008	0.750	0.04	0.525	1.5	5.5
497.1	497	754.63	498	753.55	286.90	0.40%	8	0.012	0.009	0.860	0.17	0.519	1.7	25.4
498.1	498	753.55	524	753.19	127.90	0.30%	12	0.012	0.011	0.850	0.05	1.323	0.8	5.4
499.1	499	753.94	498	753.55	143.60	0.30%	12	0.012	0.000	0.460	0.00	1.300	0.0	0.3
500.1	500	754.30	499	753.94	131.60	0.30%	12	0.012	0.000	0.050	0.00	1.305	0.0	0.2
501.1	501	757.05	495	756.08	255.90	0.40%	8	0.012	0.003	0.670	0.13	0.521	0.6	18.9
502.1	502	757.55	501	757.05	146.90	0.30%	8	0.012	0.003	0.600	0.02	0.494	0.6	2.3
503.1	503	758.58	502	757.55	273.20	0.40%	8	0.012	0.002	0.540	0.11	0.520	0.3	16.2
504.1	504	759.38	503	758.58	205.40	0.40%	8	0.012	0.001	0.530	0.00	0.528	0.2	0.7
505.1	505	759.78	504	759.38	88.40	0.50%	8	0.012	0.001	0.530	0.00	0.569	0.2	0.7
506.1	506	760.54	505	759.78	193.60	0.40%	8	0.012	0.000	0.190	0.00	0.530	0.0	0.4
507.1	507	761.43	505	759.78	456.70	0.40%	8	0.012	0.000	0.000	0.09	0.509	0.0	13.7
508.1	508	759.47	509	759.17	59.10	0.50%	6	0.012	0.001	0.520	0.00	0.280	0.2	0.7
509.1	509	759.17	510	758.76	89.90	0.50%	8	0.012	0.001	0.520	0.00	0.571	0.1	0.5
510.1	510	758.76	512	756.78	551.70	0.40%	8	0.012	0.002	0.540	0.10	0.507	0.3	14.3
511.1	511	759.06	510	758.76	57.60	0.50%	8	0.012	0.001	0.530	0.00	0.611	0.2	0.6
512.1	512	756.78	513	755.64	306.90	0.40%	8	0.012	0.003	0.630	0.02	0.516	0.5	3.4
513.1	513	755.64	518	754.64	294.60	0.30%	8	0.012	0.003	0.640	0.12	0.493	0.7	18.5
514.1	514	756.17	513	755.64	127.00	0.40%	8	0.012	0.000	0.310	0.00	0.547	0.0	0.4
515.1	515	757.48	516	756.60	230.50	0.40%	8	0.012	0.000	0.120	0.00	0.523	0.0	0.3
516.1	516	756.60	517	755.66	245.70	0.40%	8	0.012	0.007	0.710	0.03	0.523	1.3	4.6
517.1	517	755.66	518	754.64	299.70	0.30%	8	0.012	0.007	0.830	0.05	0.494	1.5	8.2
518.1	518	754.64	519	753.52	299.70	0.40%	8	0.012	0.012	0.860	0.07	0.517	2.3	11.2
519.1	519	753.52	521	753.01	150.30	0.30%	8	0.012	0.014	0.980	0.07	0.493	2.8	11.1

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
520.1	520	755.07	519	753.52	425.70	0.40%	8	0.012	0.000	0.310	0.00	0.511	0.0	0.4
521.1	521	753.01	522	752.26	191.70	0.40%	8	0.012	0.014	0.980	0.08	0.529	2.6	11.3
522.1	522	752.26	2062	752.00	81.30	0.30%	12	0.012	0.029	0.740	0.13	1.411	2.0	13.0
523.1	523	752.73	522	752.26	186.10	0.30%	12	0.012	0.013	0.920	0.06	1.254	1.0	6.4
524.1	524	753.19	523	752.73	181.40	0.30%	12	0.012	0.011	0.850	0.05	1.256	0.9	5.3
526.1	526	757.98	516	756.60	377.40	0.40%	8	0.012	0.006	0.720	0.13	0.512	1.2	20.1
527.1	527	764.56	528	758.33	63.10	9.90%	8	0.012	0.005	0.610	0.01	2.659	0.2	2.1
528.1	528	758.33	526	757.98	74.40	0.50%	8	0.012	0.006	0.720	0.03	0.580	1.0	5.2
529.1	529	778.00	530	768.40	206.60	4.60%	8	0.012	0.000	0.250	0.00	1.824	0.0	0.4
530.1	530	768.40	531	765.40	66.40	4.50%	8	0.012	0.001	0.530	0.00	1.799	0.0	0.6
531.1	531	765.40	532	762.80	145.10	1.80%	8	0.012	0.001	0.530	0.00	1.133	0.1	0.6
532.1	532	762.80	533	760.84	371.30	0.50%	8	0.012	0.002	0.540	0.15	0.615	0.3	21.8
533.1	533	760.84	541	757.16	332.50	1.10%	8	0.012	0.006	0.650	0.02	0.890	0.7	3.1
534.1	534	776.58	533	760.84	259.80	6.10%	8	0.012	0.001	0.520	0.67	2.082	0.0	100.0
535.1	535	780.86	534	776.58	108.30	4.00%	8	0.012	0.000	0.190	0.00	1.682	0.0	0.4
536.1	536	784.00	537	778.00	125.40	4.80%	8	0.012	0.000	0.310	0.00	1.851	0.0	0.4
537.1	537	778.00	538	775.00	129.50	2.30%	8	0.012	0.001	0.530	0.00	1.288	0.1	0.6
538.1	538	775.00	539	768.65	289.80	2.20%	8	0.012	0.001	0.530	0.64	1.252	0.1	95.9
539.1	539	768.65	533	760.84	320.40	2.40%	8	0.012	0.002	0.540	0.01	1.321	0.1	0.8
540.1	540	758.97	541	757.16	185.60	1.00%	8	0.012	0.000	0.430	0.00	0.835	0.0	0.5
541.1	541	757.16	548	743.98	466.30	2.80%	8	0.012	0.007	0.640	0.67	1.422	0.5	100.0
542.1	542	749.50	543	748.45	82.10	1.30%	8	0.012	0.001	0.520	0.00	0.957	0.0	0.5
543.1	543	748.45	544	747.79	133.40	0.50%	8	0.012	0.001	0.520	0.00	0.595	0.1	0.6
544.1	544	747.79	545	742.52	208.20	2.50%	8	0.012	0.001	0.530	0.00	1.346	0.1	0.7
545.1	545	742.52	552	738.40	189.90	2.20%	8	0.012	0.002	0.540	0.00	1.246	0.1	0.7
546.1	546	738.08	551	735.42	78.90	3.40%	8	0.012	0.009	0.750	0.04	1.553	0.6	5.6
547.1	547	742.22	546	738.08	97.60	4.20%	8	0.012	0.008	0.680	0.02	1.743	0.5	3.5
548.1	548	743.98	547	742.22	98.00	1.80%	8	0.012	0.008	0.720	0.03	1.134	0.7	4.9
549.1	549	728.76	1588	727.30	303.50	0.50%	10	0.012	0.017	0.960	0.07	1.064	1.6	8.0
550.1	550	730.90	1587	729.99	34.60	2.60%	8	0.012	0.012	0.820	0.04	1.371	0.9	6.7
551.1	551	735.42	550	730.90	354.70	1.30%	8	0.012	0.011	0.770	0.36	0.955	1.1	53.9
552.1	552	738.40	551	735.42	163.70	1.80%	8	0.012	0.002	0.540	0.01	1.142	0.2	0.8
553.1	553	742.47	1139	741.73	120.90	0.60%	6	0.015	0.009	0.800	0.05	0.246	3.6	9.2
554.1	554	713.61	368	713.41	43.20	0.50%	8	0.015	0.026	0.740	0.14	0.460	5.5	20.9
555.1	555	716.96	554	713.61	129.00	2.60%	6	0.015	0.000	0.490	0.00	0.507	0.1	0.6
556.1	556	740.60	278	739.78	104.90	0.80%	10	0.013	0.042	1.220	0.13	1.252	3.3	15.3
557.1	557	697.38	359	695.37	390.50	0.50%	6	0.015	0.003	0.580	0.16	0.226	1.2	31.1
558.1	558	698.73	557	697.38	271.90	0.50%	6	0.015	0.001	0.530	0.14	0.222	0.4	27.8
559.1	559	718.63	2367	718.23	59.60	0.70%	6	0.015	0.000	0.000	0.00	0.258	0.0	0.0
560.1	560	688.08	567	687.05	314.50	0.30%	10	0.011	0.048	1.080	0.15	0.958	5.0	18.4

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
561.1	561	701.29	562	692.37	424.00	2.10%	8	0.011	0.000	0.000	0.00	1.339	0.0	0.0
562.1	562	692.37	568	674.85	398.50	4.40%	8	0.011	0.004	0.590	0.01	1.935	0.2	1.8
563.1	563	695.35	566	693.50	504.50	0.40%	8	0.011	0.002	0.540	0.00	0.559	0.3	0.7
564.1	564	703.55	565	700.89	516.40	0.50%	8	0.011	0.002	0.540	0.00	0.662	0.2	0.7
565.1	565	700.89	566	693.50	290.20	2.50%	8	0.011	0.005	0.650	0.67	1.473	0.3	100.0
566.1	566	693.50	560	688.08	290.80	1.90%	8	0.011	0.010	0.760	0.58	1.260	0.8	86.9
567.1	567	687.05	570	686.18	260.60	0.30%	10	0.011	0.049	1.100	0.24	0.967	5.1	28.9
568.1	568	674.85	572	673.17	348.00	0.50%	12	0.011	0.012	0.840	0.17	1.891	0.6	17.0
569.1	569	695.94	574	687.92	396.20	2.00%	8	0.011	0.004	0.610	0.59	1.313	0.3	88.3
570.1	570	686.18	571	685.27	273.70	0.30%	10	0.011	0.051	1.120	0.25	0.965	5.3	29.7
571.1	571	685.27	572	673.17	399.10	3.00%	10	0.011	0.053	1.380	0.09	2.914	1.8	11.2
572.1	572	673.17	575	672.20	292.50	0.30%	12	0.011	0.069	1.260	0.26	1.567	4.4	26.1
573.1	573	685.55	585	676.19	249.20	3.80%	8	0.011	0.002	0.540	0.67	1.789	0.1	100.0
574.1	574	687.92	575	672.20	400.80	3.90%	8	0.011	0.006	0.640	0.02	1.828	0.3	2.8
575.1	575	672.20	576	671.12	324.30	0.30%	12	0.011	0.080	1.350	0.17	1.570	5.1	17.3
576.1	576	671.12	577	670.17	290.00	0.30%	12	0.011	0.084	1.380	0.27	1.557	5.4	27.2
577.1	577	670.17	583	668.60	375.70	0.40%	12	0.011	0.142	1.880	0.32	1.759	8.1	31.8
578.1	578	684.24	577	670.17	453.50	3.10%	8	0.011	0.037	1.230	0.67	1.626	2.3	100.0
579.1	579	685.77	578	684.24	287.80	0.50%	8	0.011	0.033	1.090	0.28	0.673	4.9	42.1
580.1	580	692.25	579	685.77	239.20	2.70%	8	0.011	0.031	1.170	0.08	1.519	2.1	12.7
581.1	581	697.07	580	692.25	376.30	1.30%	8	0.011	0.028	1.140	0.43	1.045	2.7	64.4
582.1	582	701.58	569	695.94	404.00	1.40%	8	0.011	0.001	0.520	0.00	1.091	0.0	0.5
583.1	583	668.60	584	667.30	296.90	0.40%	12	0.011	0.159	2.000	0.34	1.801	8.8	34.4
584.1	584	667.30	679	662.00	310.40	1.70%	12	0.011	0.159	2.510	0.15	3.556	4.5	15.5
585.1	585	676.19	568	674.85	247.80	0.50%	8	0.011	0.004	0.610	0.15	0.679	0.5	22.6
586.1	586	651.40	587	649.80	285.00	0.60%	8	0.011	0.049	1.480	0.30	0.692	7.1	44.4
587.1	587	649.80	606	648.89	162.90	0.60%	10	0.011	0.063	1.570	0.14	1.251	5.0	17.0
588.1	588	654.12	586	651.40	396.40	0.70%	8	0.011	0.046	1.500	0.32	0.765	6.0	48.4
589.1	589	655.35	588	654.12	233.00	0.50%	8	0.011	0.043	1.290	0.14	0.671	6.4	20.4
590.1	590	656.64	589	655.35	239.00	0.50%	8	0.011	0.041	1.250	0.13	0.678	6.0	20.2
591.1	591	658.24	590	656.64	303.10	0.50%	8	0.011	0.039	1.240	0.13	0.671	5.8	19.7
592.1	592	659.77	591	658.24	284.90	0.50%	8	0.011	0.023	1.130	0.24	0.676	3.3	36.7
593.1	593	661.30	592	659.77	284.10	0.50%	8	0.011	0.004	0.620	0.17	0.677	0.6	25.7
594.1	594	662.78	593	661.30	257.00	0.60%	8	0.011	0.002	0.540	0.15	0.700	0.3	23.0
595.1	595	662.68	594	662.78	257.00	0.00%	8	0.011	0.000	0.010	0.21	0.182	0.2	31.8
596.1	596	673.56	597	668.10	258.60	2.10%	8	0.011	0.000	0.520	0.55	1.341	0.0	82.4
597.1	597	668.10	592	659.77	257.30	3.20%	8	0.011	0.002	0.560	0.67	1.661	0.1	100.0
598.1	598	663.04	592	659.77	285.50	1.10%	8	0.011	0.013	0.820	0.37	0.988	1.3	55.5
599.1	599	668.76	598	663.04	277.70	2.10%	8	0.011	0.006	0.640	0.59	1.325	0.5	88.4
600.1	600	673.58	599	668.76	235.80	2.00%	8	0.011	0.000	0.380	0.00	1.320	0.0	0.5

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
601.1	601	671.23	602	662.49	479.20	1.80%	8	0.011	0.003	0.570	0.49	1.246	0.3	74.2
602.1	602	662.49	603	658.97	338.00	1.00%	8	0.011	0.005	0.620	0.02	0.942	0.6	2.3
603.1	603	658.97	587	649.80	437.00	2.10%	8	0.011	0.007	0.710	0.03	1.337	0.5	4.8
604.1	604	662.00	605	658.00	391.70	1.00%	8	0.011	0.001	0.530	0.29	0.933	0.1	43.5
605.1	605	658.00	587	649.80	288.40	2.80%	8	0.011	0.004	0.600	0.67	1.556	0.2	100.0
606.1	606	648.89	2477	648.54	67.60	0.50%	10	0.011	0.063	1.560	0.14	1.204	5.2	17.1
607.1	607	658.23	588	654.12	322.90	1.30%	8	0.011	0.001	0.520	0.00	1.041	0.1	0.5
608.1	608	654.27	610	653.64	105.50	0.60%	8	0.011	0.000	0.000	0.00	0.713	0.0	0.0
609.1	609	654.23	610	653.64	146.40	0.40%	8	0.011	0.001	0.530	0.00	0.586	0.2	0.7
610.1	610	653.64	611	647.34	173.30	3.60%	8	0.011	0.003	0.570	0.01	1.760	0.2	1.5
611.1	611	647.34	612	645.22	321.30	0.70%	10	0.011	0.133	2.150	0.19	1.359	9.8	23.1
612.1	612	645.22	613	644.19	267.50	0.40%	10	0.011	0.131	1.800	0.32	1.039	12.6	38.3
613.1	613	644.19	614	642.87	243.90	0.50%	10	0.011	0.104	1.830	0.18	1.231	8.4	21.8
614.1	614	642.87	615	626.15	420.10	4.00%	10	0.011	0.093	1.750	0.11	3.338	2.8	12.8
615.1	615	626.15	616	609.06	499.40	3.40%	10	0.011	0.094	1.780	0.11	3.096	3.0	13.2
616.1	616	609.06	617	606.98	366.20	0.60%	12	0.011	0.164	2.190	0.35	2.051	8.0	35.3
617.1	617	606.98	618	606.12	152.80	0.60%	15	0.011	0.174	2.150	0.20	3.701	4.7	15.8
618.1	618	606.12	632	605.11	181.30	0.60%	15	0.011	0.180	2.170	0.20	3.683	4.9	16.2
619.1	619	607.40	618	606.12	121.30	1.10%	8	0.011	0.002	0.540	0.01	0.948	0.2	0.8
620.1	620	608.50	619	607.40	196.30	0.60%	8	0.011	0.001	0.520	0.00	0.691	0.1	0.5
621.1	621	608.25	622	605.68	493.70	0.50%	8	0.011	0.001	0.530	0.15	0.666	0.1	22.0
622.1	622	605.68	625	603.33	449.10	0.50%	8	0.011	0.004	0.630	0.15	0.668	0.6	22.7
623.1	623	608.00	629	600.64	205.00	3.60%	8	0.011	0.002	0.540	0.01	1.749	0.1	0.8
624.1	624	604.55	629	600.64	282.50	1.40%	8	0.011	0.001	0.530	0.40	1.086	0.1	59.3
625.1	625	603.33	626	602.58	129.60	0.60%	8	0.011	0.006	0.700	0.03	0.702	0.9	4.4
626.1	626	602.58	627	601.22	250.00	0.50%	8	0.011	0.007	0.710	0.17	0.681	1.0	25.0
627.1	627	601.22	628	599.04	269.80	0.80%	8	0.011	0.008	0.720	0.25	0.830	1.0	37.4
628.1	628	599.04	640	597.56	348.10	0.40%	18	0.011	0.187	1.990	0.31	5.232	3.6	20.7
629.1	629	600.64	628	599.04	299.70	0.50%	18	0.011	0.181	2.170	0.19	5.862	3.1	12.6
630.1	630	602.24	629	600.64	299.00	0.50%	18	0.011	0.178	2.140	0.19	5.869	3.0	12.5
631.1	631	611.50	630	602.24	379.50	2.40%	8	0.011	0.001	0.520	0.67	1.442	0.0	99.8
632.1	632	605.11	633	603.99	204.20	0.50%	15	0.011	0.176	2.120	0.20	3.654	4.8	16.1
633.1	633	603.99	630	602.24	299.60	0.60%	15	0.011	0.177	2.220	0.20	3.771	4.7	15.7
634.1	634	613.00	636	611.55	268.40	0.50%	8	0.011	0.045	1.370	0.28	0.678	6.6	42.0
635.1	635	614.35	634	613.00	250.30	0.50%	8	0.011	0.044	1.320	0.27	0.678	6.5	40.7
636.1	636	611.55	638	609.84	322.60	0.50%	8	0.011	0.048	1.420	0.14	0.672	7.2	20.8
637.1	637	613.00	636	611.55	123.50	1.20%	8	0.011	0.002	0.540	0.00	1.000	0.1	0.7
638.1	638	609.84	640	597.56	168.70	7.30%	8	0.011	0.051	1.280	0.08	2.490	2.1	11.4
639.1	639	610.52	638	609.84	115.60	0.60%	8	0.011	0.001	0.530	0.00	0.708	0.2	0.7
640.1	640	597.56	641	596.65	200.50	0.50%	18	0.011	0.231	2.180	0.22	5.405	4.3	14.8

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
641.1	641	596.65	2091	593.90	286.60	1.00%	18	0.011	0.230	2.850	0.46	7.859	2.9	30.6
642.1	642	615.06	635	614.35	336.60	0.20%	8	0.011	0.000	0.380	0.00	0.424	0.1	0.4
643.1	643	615.44	644	611.33	268.10	1.50%	8	0.011	0.000	0.520	0.41	1.143	0.0	62.2
644.1	644	611.33	633	603.99	321.60	2.30%	8	0.011	0.002	0.590	0.01	1.394	0.2	2.1
645.1	645	611.49	618	606.12	339.70	1.60%	8	0.011	0.006	0.640	0.02	1.160	0.5	2.8
646.1	646	617.88	645	611.49	251.50	2.50%	8	0.011	0.004	0.620	0.66	1.471	0.3	98.6
647.1	647	620.79	646	617.88	280.60	1.00%	8	0.011	0.002	0.540	0.30	0.940	0.2	44.4
648.1	648	627.36	649	624.45	224.10	1.30%	8	0.011	0.021	0.960	0.06	1.052	2.0	8.9
649.1	649	624.45	653	621.44	165.20	1.80%	8	0.011	0.023	1.030	0.07	1.246	1.8	10.7
650.1	650	634.98	648	627.36	294.00	2.60%	8	0.011	0.002	0.540	0.67	1.486	0.1	100.0
651.1	651	635.99	650	634.98	203.60	0.50%	8	0.011	0.000	0.520	0.00	0.650	0.1	0.5
652.1	652	616.49	616	609.06	286.90	2.60%	8	0.011	0.026	1.060	0.67	1.485	1.8	100.0
653.1	653	621.44	652	616.49	179.50	2.80%	8	0.011	0.025	1.030	0.07	1.533	1.6	10.3
654.1	654	624.96	653	621.44	138.30	2.50%	8	0.011	0.001	0.530	0.00	1.472	0.1	0.7
655.1	655	615.96	656	613.60	226.10	1.00%	15	0.011	0.000	0.000	0.00	5.041	0.0	0.0
656.1	656	613.60	657	610.74	265.70	1.10%	15	0.011	0.000	0.000	0.29	5.119	0.0	22.9
657.1	657	610.74	658	608.25	238.00	1.00%	15	0.011	0.000	0.000	0.00	5.046	0.0	0.0
658.1	658	608.25	659	607.66	98.40	0.60%	15	0.011	0.000	0.000	0.00	3.820	0.0	0.0
659.1	659	607.66	617	606.98	165.10	0.40%	15	0.011	0.000	0.000	0.00	3.166	0.0	0.0
660.1	660	617.81	661	617.24	109.50	0.50%	8	0.011	0.009	0.800	0.05	0.666	1.4	7.0
661.1	661	617.24	635	614.35	296.70	1.00%	8	0.011	0.038	1.360	0.40	0.911	4.1	60.5
662.1	662	618.22	661	617.24	167.90	0.60%	8	0.011	0.001	0.530	0.00	0.705	0.1	0.7
663.1	663	619.13	662	618.22	162.80	0.60%	8	0.011	0.000	0.380	0.00	0.690	0.0	0.4
664.1	664	622.20	665	615.16	274.50	2.60%	10	0.012	0.027	1.110	0.78	2.457	1.1	94.0
665.1	665	615.16	666	609.06	299.50	2.00%	10	0.011	0.033	1.170	0.08	2.388	1.4	10.0
666.1	666	609.06	667	607.30	159.90	1.10%	10	0.011	0.035	1.280	0.10	1.755	2.0	12.1
667.1	667	607.30	2085	597.00	172.20	6.00%	10	0.011	0.074	1.510	0.09	4.093	1.8	10.5
668.1	668	619.09	665	615.16	382.90	1.00%	8	0.011	0.003	0.550	0.29	0.935	0.3	43.2
669.1	669	608.80	667	607.30	281.50	0.50%	10	0.012	0.036	1.200	0.27	1.120	3.2	32.0
670.1	670	611.31	669	608.80	483.20	0.50%	10	0.012	0.033	1.260	0.24	1.106	3.0	29.4
671.1	671	621.91	670	611.31	297.20	3.60%	10	0.011	0.032	1.110	0.83	3.161	1.0	100.0
672.1	672	622.04	668	619.09	286.20	1.00%	8	0.011	0.001	0.520	0.30	0.937	0.1	44.8
673.1	673	623.28	671	621.91	255.30	0.50%	10	0.011	0.030	1.110	0.24	1.226	2.4	29.4
674.1	674	632.99	673	623.28	293.50	3.30%	10	0.011	0.028	1.070	0.83	3.044	0.9	100.0
675.1	675	633.86	674	632.99	162.20	0.50%	10	0.011	0.026	1.040	0.10	1.226	2.1	12.4
676.1	676	639.02	674	632.99	239.30	2.50%	8	0.011	0.000	0.190	0.00	1.465	0.0	0.4
677.1	677	635.70	678	634.57	233.90	0.50%	8	0.012	0.008	0.730	0.03	0.588	1.3	5.1
678.1	678	634.57	664	622.20	342.00	3.60%	8	0.011	0.008	0.690	0.03	1.755	0.4	3.9
679.1	679	662.00	681	653.53	195.80	4.30%	12	0.011	0.159	2.340	0.12	5.661	2.8	12.2
680.1	680	657.56	681	653.53	56.30	7.20%	6	0.011	0.000	0.000	0.00	1.147	0.0	0.0

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
681.1	681	653.53	2392	653.33	93.70	0.20%	15	0.011	0.159	1.550	0.23	2.279	7.0	18.7
682.1	682	652.54	687	651.89	257.20	0.30%	15	0.011	0.194	1.730	0.31	2.480	7.8	25.1
683.1	683	654.81	682	652.54	280.90	0.80%	8	0.011	0.028	1.200	0.33	0.830	3.3	50.0
684.1	684	656.07	683	654.81	221.50	0.60%	8	0.011	0.026	1.110	0.11	0.696	3.7	15.9
685.1	685	656.46	684	656.07	93.90	0.40%	8	0.011	0.000	0.000	0.00	0.595	0.0	0.0
686.1	686	670.50	687	651.89	350.30	5.30%	8	0.011	0.002	0.550	0.67	2.127	0.1	100.0
687.1	687	651.89	688	651.18	281.50	0.30%	15	0.011	0.199	1.750	0.32	2.478	8.0	25.8
688.1	688	651.18	699	650.24	382.40	0.20%	15	0.011	0.204	1.740	0.32	2.446	8.3	25.8
689.1	689	667.63	688	651.18	322.10	5.10%	8	0.011	0.002	0.560	0.01	2.086	0.1	1.5
690.1	690	671.61	689	667.63	302.30	1.30%	8	0.011	0.000	0.000	0.00	1.059	0.0	0.0
691.1	691	668.35	692	660.28	403.10	2.00%	8	0.011	0.000	0.460	0.00	1.306	0.0	0.5
692.1	692	660.28	694	647.40	309.00	4.20%	8	0.011	0.005	0.630	0.02	1.884	0.3	2.7
693.1	693	664.17	692	660.28	193.80	2.00%	8	0.011	0.002	0.540	0.00	1.308	0.1	0.7
694.1	694	647.40	1430	635.30	166.80	7.30%	15	0.011	0.219	2.770	0.11	13.287	1.6	9.2
695.1	695	648.37	694	647.40	401.40	0.20%	15	0.011	0.212	1.760	0.26	2.425	8.8	20.9
697.1	697	648.93	695	648.37	226.50	0.20%	15	0.011	0.212	1.780	0.26	2.453	8.7	20.8
698.1	698	649.80	697	648.93	336.70	0.30%	15	0.011	0.210	1.800	0.26	2.508	8.4	20.5
699.1	699	650.24	698	649.80	158.80	0.30%	15	0.011	0.207	1.830	0.25	2.597	8.0	20.0
700.1	700	666.01	698	649.80	279.00	5.80%	8	0.011	0.001	0.530	0.67	2.225	0.1	100.0
701.1	701	681.32	706	666.65	291.60	5.00%	8	0.011	0.000	0.000	0.67	2.070	0.0	100.0
702.1	702	670.12	706	666.65	142.90	2.40%	8	0.011	0.004	0.590	0.01	1.438	0.3	1.9
703.1	703	670.74	702	670.12	31.80	1.90%	8	0.011	0.004	0.640	0.02	1.288	0.3	3.4
704.1	704	674.47	703	670.74	195.10	1.90%	8	0.011	0.004	0.660	0.03	1.276	0.3	4.0
705.1	705	677.35	704	674.47	274.50	1.00%	8	0.011	0.001	0.520	0.29	0.945	0.1	43.8
706.1	706	666.65	707	661.90	143.70	3.30%	8	0.011	0.006	0.630	0.02	1.678	0.4	2.6
707.1	707	661.90	708	655.95	166.50	3.60%	8	0.011	0.015	0.870	0.05	1.745	0.9	7.7
708.1	708	655.95	709	654.89	164.30	0.60%	8	0.011	0.015	0.930	0.06	0.741	2.0	9.4
709.1	709	654.89	710	651.84	499.00	0.60%	8	0.011	0.015	0.700	0.02	0.722	2.1	2.5
710.1	710	651.84	2193	641.20	352.80	3.00%	18	0.011	0.670	4.900	1.03	13.933	4.8	68.4
711.1	711	669.76	707	661.90	110.80	7.10%	8	0.011	0.007	0.660	0.02	2.458	0.3	3.1
712.1	712	679.63	711	669.76	221.80	4.40%	8	0.011	0.001	0.530	0.00	1.947	0.0	0.6
713.1	713	684.14	712	679.63	98.70	4.60%	8	0.011	0.000	0.000	0.00	1.973	0.0	0.0
714.1	714	671.22	711	669.76	172.60	0.80%	8	0.011	0.004	0.610	0.02	0.849	0.5	2.4
715.1	715	676.49	714	671.22	205.90	2.60%	8	0.011	0.003	0.560	0.01	1.477	0.2	1.1
716.1	716	686.74	2428	683.66	103.70	3.00%	8	0.011	0.001	0.530	0.00	1.591	0.1	0.7
717.1	717	677.05	715	676.49	78.10	0.70%	8	0.011	0.000	0.000	0.00	0.782	0.0	0.0
718.1	718	675.22	723	675.25	249.10	0.00%	8	0.011	0.000	0.000	0.19	0.101	0.0	28.4
719.1	719	677.57	720	670.58	504.40	1.40%	8	0.011	0.001	0.520	0.00	1.087	0.0	0.5
720.1	720	670.58	721	664.53	281.50	2.10%	8	0.011	0.005	0.620	0.62	1.353	0.3	93.4
721.1	721	664.53	724	662.82	142.90	1.20%	8	0.011	0.024	1.050	0.07	1.010	2.3	11.0

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
722.1	722	664.87	721	664.53	17.20	2.00%	8	0.011	0.002	0.570	0.01	1.297	0.2	1.7
723.1	723	675.25	722	664.87	267.20	3.90%	8	0.011	0.002	0.560	0.67	1.819	0.1	100.0
724.1	724	662.82	725	662.82	38.40	0.00%	8	0.011	0.024	0.530	0.17	0.000	Infinity	25.1
725.1	725	662.82	684	656.07	142.10	4.80%	8	0.011	0.024	1.020	0.07	2.012	1.2	10.2
726.1	726	667.84	721	664.53	294.50	1.10%	8	0.011	0.013	0.820	0.38	0.978	1.3	56.3
727.1	727	676.28	726	667.84	277.60	3.00%	8	0.011	0.002	0.560	0.67	1.609	0.1	100.0
728.1	728	672.68	726	667.84	288.90	1.70%	8	0.011	0.008	0.690	0.51	1.195	0.6	76.7
729.1	729	674.86	728	672.68	65.00	3.40%	8	0.011	0.004	0.590	0.01	1.690	0.2	1.8
730.1	730	679.37	729	674.86	465.90	1.00%	8	0.011	0.004	0.590	0.26	0.908	0.4	39.3
731.1	731	681.89	730	679.37	259.60	1.00%	8	0.011	0.002	0.540	0.26	0.909	0.2	38.6
732.1	732	684.52	733	683.34	70.90	1.70%	8	0.011	0.001	0.520	0.00	1.191	0.0	0.5
733.1	733	683.34	731	681.89	164.70	0.90%	8	0.011	0.001	0.530	0.00	0.866	0.1	0.7
734.1	734	682.21	735	676.92	278.90	1.90%	8	0.011	0.000	0.000	0.53	1.271	0.0	79.3
735.1	735	676.92	736	661.72	297.50	5.10%	8	0.011	0.002	0.560	0.67	2.086	0.1	100.0
736.1	736	661.72	737	660.18	113.70	1.40%	8	0.011	0.004	0.590	0.01	1.074	0.4	1.6
737.1	737	660.18	739	639.16	309.10	6.80%	8	0.011	0.007	0.660	0.02	2.407	0.3	3.3
738.1	738	660.63	737	660.18	77.90	0.60%	8	0.011	0.002	0.540	0.01	0.702	0.2	0.8
739.1	739	639.16	1990	637.51	452.70	0.40%	18	0.011	0.679	2.920	0.48	4.844	14.0	31.8
740.1	740	663.05	741	661.92	196.30	0.60%	8	0.011	0.000	0.000	0.00	0.700	0.0	0.0
741.1	741	661.92	742	660.61	168.20	0.80%	8	0.011	0.002	0.540	0.00	0.815	0.2	0.7
742.1	742	660.61	745	659.50	191.80	0.60%	8	0.011	0.008	0.750	0.04	0.702	1.1	5.5
743.1	743	663.21	742	660.61	150.40	1.70%	8	0.011	0.005	0.680	0.03	1.213	0.4	4.3
744.1	744	664.58	743	663.21	227.40	0.60%	8	0.011	0.004	0.620	0.02	0.716	0.6	2.7
745.1	745	659.50	747	658.45	173.20	0.60%	8	0.011	0.009	0.770	0.04	0.719	1.3	6.1
746.1	746	665.17	744	664.58	176.00	0.30%	8	0.011	0.002	0.550	0.01	0.534	0.4	1.1
747.1	747	658.45	752	657.12	294.30	0.50%	8	0.011	0.010	0.860	0.19	0.621	1.7	28.4
748.1	748	667.11	746	665.17	225.40	0.90%	8	0.011	0.000	0.460	0.00	0.856	0.0	0.5
749.1	749	668.81	751	668.19	91.60	0.70%	8	0.011	0.000	0.460	0.00	0.759	0.0	0.5
750.1	750	672.30	751	668.19	82.20	5.00%	8	0.011	0.000	0.000	0.00	2.064	0.0	0.0
751.1	751	668.19	752	657.12	281.20	3.90%	8	0.011	0.001	0.530	0.67	1.831	0.1	100.0
752.1	752	657.12	753	654.86	363.60	0.60%	8	0.011	0.014	0.920	0.22	0.728	2.0	33.5
753.1	753	654.86	754	635.46	160.70	12.10%	8	0.011	0.018	0.830	0.04	3.207	0.6	5.6
754.1	754	635.46	1430	635.30	134.70	0.10%	18	0.011	0.699	2.260	0.47	2.766	25.3	31.6
755.1	755	702.00	764	700.75	293.20	0.40%	8	0.011	0.008	0.820	0.18	0.603	1.4	26.4
756.1	756	711.10	755	702.00	350.30	2.60%	8	0.011	0.005	0.620	0.67	1.488	0.4	99.9
757.1	757	715.39	756	711.10	359.10	1.20%	8	0.011	0.003	0.550	0.31	1.009	0.3	47.0
758.1	758	716.81	757	715.39	254.60	0.60%	8	0.011	0.001	0.530	0.15	0.689	0.1	21.9
759.1	759	718.80	760	716.79	377.50	0.50%	8	0.011	0.000	0.000	0.14	0.674	0.0	21.5
760.1	760	716.79	767	713.64	380.40	0.80%	8	0.011	0.002	0.540	0.23	0.840	0.2	34.5
761.1	761	717.08	762	714.04	301.00	1.00%	8	0.011	0.001	0.530	0.00	0.928	0.1	0.6

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
762.1	762	714.04	763	707.04	362.40	1.90%	8	0.011	0.003	0.600	0.52	1.283	0.2	77.3
763.1	763	707.04	764	700.75	327.90	1.90%	8	0.011	0.006	0.630	0.02	1.278	0.4	2.6
764.1	764	700.75	581	697.07	289.60	1.30%	8	0.011	0.018	0.930	0.43	1.041	1.7	63.9
765.1	765	701.77	581	697.07	385.70	1.20%	8	0.011	0.007	0.670	0.36	1.019	0.7	53.7
766.1	766	707.61	765	701.77	386.50	1.50%	8	0.011	0.006	0.670	0.44	1.135	0.5	66.4
767.1	767	713.64	766	707.61	387.10	1.60%	8	0.011	0.004	0.640	0.45	1.152	0.3	67.9
768.1	768	700.63	578	684.24	457.60	3.60%	8	0.011	0.001	0.530	0.67	1.747	0.1	100.0
769.1	769	670.11	770	666.48	159.80	2.30%	8	0.012	0.002	0.570	0.01	1.275	0.2	1.5
770.1	770	666.48	771	662.54	468.30	0.80%	8	0.012	0.004	0.610	0.24	0.776	0.5	35.4
771.1	771	662.54	772	657.74	479.60	1.00%	8	0.012	0.008	0.720	0.30	0.846	0.9	44.8
772.1	772	657.74	773	650.65	415.70	1.70%	8	0.012	0.012	0.760	0.03	1.105	1.1	5.1
773.1	773	650.65	382	649.00	329.60	0.50%	8	0.012	0.041	1.120	0.15	0.599	6.9	22.1
774.1	774	652.00	773	650.65	289.20	0.50%	8	0.012	0.025	0.840	0.26	0.578	4.4	39.3
775.1	775	656.99	774	652.00	414.30	1.20%	8	0.012	0.008	0.690	0.03	0.929	0.8	4.0
776.1	776	661.79	775	656.99	479.70	1.00%	8	0.012	0.004	0.610	0.28	0.846	0.5	42.2
777.1	777	667.76	776	661.79	401.70	1.50%	8	0.012	0.001	0.530	0.00	1.031	0.1	0.7
778.1	778	666.43	779	659.49	456.40	1.50%	8	0.012	0.002	0.540	0.39	1.043	0.2	58.6
779.1	779	659.49	780	656.45	418.60	0.70%	8	0.012	0.005	0.660	0.02	0.721	0.7	3.6
780.1	780	656.45	781	653.55	400.10	0.70%	8	0.012	0.009	0.770	0.04	0.720	1.2	6.0
781.1	781	653.55	774	652.00	291.00	0.50%	8	0.012	0.014	0.960	0.23	0.618	2.2	34.0
782.1	782	685.50	783	684.50	93.40	1.10%	8	0.011	0.000	0.000	0.00	0.955	0.0	0.0
783.1	783	684.50	784	682.72	120.70	1.50%	8	0.011	0.001	0.530	0.00	1.121	0.1	0.7
784.1	784	682.72	786	680.74	102.70	1.90%	8	0.011	0.001	0.530	0.00	1.282	0.1	0.7
785.1	785	686.12	798	681.59	297.20	1.50%	8	0.011	0.001	0.530	0.46	1.139	0.1	68.6
786.1	786	680.74	787	678.24	123.50	2.00%	8	0.011	0.002	0.560	0.01	1.313	0.2	1.2
787.1	787	678.24	788	675.64	264.90	1.00%	8	0.011	0.003	0.560	0.27	0.914	0.3	40.0
788.1	788	675.64	789	675.08	115.10	0.50%	8	0.011	0.005	0.700	0.03	0.644	0.8	4.6
789.1	789	675.08	790	673.67	123.20	1.10%	8	0.011	0.006	0.650	0.02	0.987	0.6	3.0
790.1	790	673.67	791	671.84	122.70	1.50%	8	0.011	0.007	0.700	0.03	1.127	0.6	4.3
791.1	791	671.84	808	669.86	397.10	0.50%	8	0.011	0.037	1.110	0.28	0.652	5.7	41.7
792.1	792	672.30	791	671.84	99.70	0.50%	8	0.011	0.029	0.940	0.13	0.627	4.6	19.3
793.1	793	672.79	792	672.30	110.50	0.40%	8	0.011	0.028	0.920	0.13	0.615	4.6	19.3
794.1	794	676.00	793	672.79	76.50	4.20%	8	0.011	0.007	0.670	0.02	1.891	0.4	3.3
795.1	795	677.88	794	676.00	115.80	1.60%	8	0.011	0.007	0.700	0.03	1.176	0.6	4.6
796.1	796	679.43	795	677.88	103.40	1.50%	8	0.011	0.006	0.670	0.02	1.130	0.5	3.7
797.1	797	680.44	796	679.43	102.00	1.00%	8	0.011	0.005	0.620	0.02	0.918	0.5	2.4
798.1	798	681.59	797	680.44	114.70	1.00%	8	0.011	0.005	0.620	0.02	0.924	0.5	2.4
799.1	799	678.23	800	677.58	130.00	0.50%	8	0.011	0.005	0.660	0.02	0.653	0.7	3.7
800.1	800	677.58	801	677.08	99.80	0.50%	8	0.011	0.005	0.660	0.03	0.653	0.7	3.8
801.1	801	677.08	802	674.91	338.30	0.60%	8	0.011	0.007	0.720	0.03	0.739	0.9	5.1

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
802.1	802	674.91	803	673.20	81.20	2.10%	8	0.011	0.009	0.770	0.04	1.340	0.7	5.9
803.1	803	673.20	793	672.79	128.10	0.30%	8	0.011	0.020	0.870	0.11	0.522	3.9	16.0
804.1	804	677.19	805	676.49	151.40	0.50%	8	0.011	0.001	0.520	0.00	0.628	0.1	0.5
805.1	805	676.49	803	673.20	279.70	1.20%	8	0.011	0.009	0.700	0.36	1.001	0.9	53.4
806.1	806	679.99	805	676.49	456.60	0.80%	8	0.011	0.004	0.610	0.21	0.808	0.5	31.6
807.1	807	683.94	806	679.99	384.30	1.00%	8	0.011	0.001	0.530	0.29	0.936	0.1	43.0
808.1	808	669.86	809	665.97	369.20	1.10%	8	0.011	0.040	1.390	0.39	0.947	4.3	59.0
809.1	809	665.97	810	664.38	91.50	1.70%	8	0.011	0.044	1.360	0.10	1.217	3.6	15.6
810.1	810	664.38	811	663.27	110.70	1.00%	8	0.011	0.045	1.450	0.12	0.924	4.8	18.1
811.1	811	663.27	812	660.55	274.80	1.00%	8	0.011	0.045	1.470	0.40	0.918	4.9	59.4
812.1	812	660.55	814	659.95	121.10	0.50%	8	0.011	0.049	1.290	0.15	0.650	7.6	22.5
813.1	813	663.79	812	660.55	162.40	2.00%	8	0.011	0.002	0.540	0.00	1.304	0.1	0.7
814.1	814	659.95	815	659.09	169.50	0.50%	8	0.011	0.050	1.310	0.15	0.658	7.6	22.6
815.1	815	659.09	817	657.69	282.40	0.50%	8	0.011	0.053	1.360	0.29	0.650	8.2	43.9
816.1	816	664.15	815	659.09	253.30	2.00%	8	0.011	0.001	0.520	0.51	1.304	0.0	76.5
817.1	817	657.69	818	657.00	91.50	0.80%	8	0.011	0.057	1.620	0.14	0.801	7.1	21.2
818.1	818	657.00	838	648.61	307.60	2.70%	8	0.011	0.057	1.470	0.11	1.524	3.7	15.8
819.1	819	661.87	817	657.69	209.30	2.00%	8	0.011	0.002	0.540	0.00	1.304	0.1	0.7
820.1	820	675.41	821	671.56	125.40	3.10%	8	0.011	0.000	0.000	0.00	1.617	0.0	0.0
821.1	821	671.56	849	671.02	109.70	0.50%	8	0.011	0.001	0.530	0.00	0.648	0.2	0.7
822.1	822	668.36	823	665.51	123.20	2.30%	8	0.011	0.000	0.000	0.00	1.404	0.0	0.0
823.1	823	665.51	824	662.97	121.50	2.10%	8	0.011	0.001	0.530	0.00	1.335	0.1	0.7
824.1	824	662.97	827	661.80	142.50	0.80%	8	0.011	0.004	0.600	0.01	0.836	0.4	2.1
825.1	825	663.72	824	662.97	197.40	0.40%	8	0.011	0.000	0.000	0.00	0.569	0.0	0.0
826.1	826	664.09	825	663.72	80.60	0.50%	8	0.011	0.000	0.000	0.00	0.625	0.0	0.0
827.1	827	661.80	828	661.14	171.50	0.40%	8	0.011	0.005	0.650	0.02	0.573	0.8	3.3
828.1	828	661.14	829	660.12	279.40	0.40%	8	0.011	0.006	0.760	0.14	0.558	1.1	21.6
829.1	829	660.12	830	658.99	309.60	0.40%	8	0.011	0.009	0.830	0.05	0.558	1.5	8.0
830.1	830	658.99	831	658.14	226.10	0.40%	8	0.011	0.011	0.850	0.05	0.566	2.0	7.9
831.1	831	658.14	832	657.46	176.30	0.40%	8	0.011	0.013	0.940	0.07	0.573	2.3	10.1
832.1	832	657.46	833	656.81	166.30	0.40%	8	0.011	0.015	0.980	0.07	0.577	2.6	10.9
833.1	833	656.81	834	656.04	204.20	0.40%	8	0.011	0.017	1.050	0.08	0.567	3.0	12.5
834.1	834	656.04	835	655.26	204.70	0.40%	8	0.011	0.019	1.070	0.09	0.570	3.3	13.2
835.1	835	655.26	836	654.79	113.30	0.40%	8	0.011	0.039	1.090	0.14	0.594	6.6	21.7
836.1	836	654.79	837	654.26	132.10	0.40%	8	0.011	0.040	1.080	0.15	0.585	6.8	22.0
837.1	837	654.26	838	648.61	399.20	1.40%	8	0.011	0.041	1.350	0.11	1.098	3.7	16.1
838.1	838	648.61	839	647.00	67.10	2.40%	8	0.011	0.102	1.950	0.13	1.430	7.1	19.8
839.1	839	647.00	840	636.26	33.90	31.60%	8	0.011	0.102	1.670	0.08	5.192	2.0	11.5
840.1	840	636.26	2275	633.79	735.40	0.30%	24	0.011	1.660	3.550	0.56	10.014	16.6	28.1
841.1	841	660.67	835	655.26	154.30	3.50%	8	0.011	0.018	0.930	0.06	1.728	1.0	8.6

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
842.1	842	661.76	841	660.67	244.90	0.40%	8	0.011	0.016	1.010	0.08	0.616	2.6	11.7
843.1	843	662.37	842	661.76	131.40	0.50%	8	0.011	0.015	0.970	0.07	0.629	2.3	10.7
844.1	844	666.07	843	662.37	400.40	0.90%	8	0.011	0.011	0.790	0.04	0.887	1.3	6.2
845.1	845	666.64	844	666.07	115.40	0.50%	8	0.011	0.010	0.840	0.05	0.649	1.6	7.8
846.1	846	667.16	845	666.64	106.10	0.50%	8	0.011	0.009	0.820	0.05	0.646	1.4	7.3
847.1	847	668.81	846	667.16	387.10	0.40%	8	0.011	0.006	0.710	0.15	0.603	1.0	22.6
848.1	848	669.67	847	668.81	188.10	0.50%	8	0.011	0.004	0.640	0.02	0.624	0.7	3.2
849.1	849	671.02	848	669.67	313.20	0.40%	8	0.011	0.002	0.540	0.01	0.606	0.3	0.8
850.1	850	657.16	851	655.60	106.80	1.50%	8	0.011	0.000	0.000	0.00	1.116	0.0	0.0
851.1	851	655.60	852	649.96	430.20	1.30%	8	0.011	0.007	0.650	0.02	1.057	0.6	2.9
852.1	852	649.96	853	646.25	312.70	1.20%	8	0.011	0.021	1.020	0.07	1.005	2.1	10.7
853.1	853	646.25	854	631.31	229.40	6.50%	8	0.011	0.024	1.000	0.06	2.356	1.0	9.2
854.1	854	631.31	1984	631.31	266.20	0.00%	24	0.011	2.287	2.460	0.93	0.000	Infinity	46.6
855.1	855	659.81	859	658.62	143.00	0.80%	8	0.011	0.001	0.530	0.00	0.842	0.1	0.6
856.1	856	659.80	857	656.37	359.30	1.00%	8	0.011	0.003	0.560	0.25	0.902	0.3	38.0
857.1	857	656.37	858	653.48	444.60	0.70%	8	0.011	0.006	0.680	0.03	0.744	0.8	3.9
858.1	858	653.48	852	649.96	252.50	1.40%	8	0.011	0.010	0.710	0.38	1.090	0.9	56.8
859.1	859	658.62	851	655.60	359.80	0.80%	8	0.011	0.002	0.560	0.22	0.846	0.3	33.5
860.1	860	665.00	433	661.23	221.90	1.70%	6	0.012	0.000	0.000	0.00	0.512	0.0	0.0
861.1	861	652.16	425	651.91	58.30	0.40%	8	0.012	0.149	1.900	0.25	0.554	26.8	37.8
862.1	862	661.88	875	647.93	155.20	9.00%	8	0.011	0.034	1.010	0.05	2.767	1.2	7.5
863.1	863	709.69	92	702.44	394.30	1.80%	8	0.011	0.004	0.670	0.56	1.252	0.4	84.4
864.1	864	709.95	865	704.17	292.50	2.00%	8	0.011	0.003	0.590	0.59	1.298	0.2	88.8
865.1	865	704.17	868	696.51	310.70	2.50%	8	0.011	0.005	0.640	0.02	1.449	0.3	3.0
866.1	866	707.14	867	705.78	327.40	0.40%	8	0.011	0.002	0.540	0.00	0.595	0.3	0.7
867.1	867	705.78	868	696.51	199.30	4.70%	8	0.011	0.003	0.580	0.01	1.990	0.2	1.7
868.1	868	696.51	872	678.90	301.10	5.80%	8	0.011	0.008	0.680	0.02	2.232	0.4	3.7
869.1	869	676.61	LS_KT	668.00	14.00	61.30%	8	0.011	0.027	0.880	0.03	7.229	0.4	5.1
870.1	870	677.22	869	676.61	108.90	0.60%	8	0.011	0.027	0.980	0.12	0.691	3.9	17.9
871.1	871	678.15	870	677.22	206.50	0.50%	8	0.011	0.023	0.960	0.11	0.619	3.7	16.3
872.1	872	678.90	871	678.15	164.30	0.50%	8	0.011	0.022	1.010	0.10	0.624	3.5	15.1
873.1	873	680.20	872	678.90	299.40	0.40%	8	0.011	0.012	0.900	0.06	0.608	1.9	9.4
874.1	874	681.90	873	680.20	298.30	0.60%	8	0.011	0.007	0.720	0.03	0.697	0.9	5.1
875.1	875	647.93	876	647.21	503.50	0.10%	27	0.011	0.569	1.900	0.39	8.945	6.4	17.4
876.1	876	647.21	95	646.34	511.00	0.20%	27	0.011	0.582	2.030	0.38	9.760	6.0	16.9
877.1	877	696.10	878	679.51	310.10	5.30%	8	0.011	0.000	0.000	0.00	2.135	0.0	0.0
878.1	878	679.51	879	666.00	313.50	4.30%	8	0.011	0.002	0.540	0.01	1.916	0.1	0.8
879.1	879	666.00	881	664.90	305.20	0.40%	8	0.011	0.004	0.690	0.03	0.554	0.7	4.7
880.1	880	688.60	881	664.90	440.70	5.40%	8	0.011	0.001	0.530	0.00	2.141	0.1	0.7
881.1	881	664.90	886	664.49	99.50	0.40%	8	0.011	0.008	0.770	0.04	0.593	1.3	6.3

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
882.1	882	666.00	886	664.49	129.20	1.20%	8	0.011	0.000	0.000	0.00	0.998	0.0	0.0
883.1	883	702.50	884	688.25	410.40	3.50%	8	0.011	0.000	0.000	0.00	1.720	0.0	0.0
884.1	884	688.25	885	666.90	411.50	5.20%	8	0.011	0.000	0.000	0.00	2.102	0.0	0.0
885.1	885	666.90	862	661.88	122.10	4.10%	8	0.011	0.002	0.540	0.00	1.871	0.1	0.7
886.1	886	664.49	1257	649.42	148.40	10.20%	8	0.011	0.008	0.660	0.02	2.941	0.3	3.0
887.1	887	705.39	888	704.90	78.40	0.60%	8	0.011	0.000	0.000	0.00	0.730	0.0	0.0
888.1	888	704.90	889	690.90	398.90	3.50%	8	0.011	0.001	0.530	0.00	1.729	0.0	0.6
889.1	889	690.90	890	683.00	216.20	3.70%	8	0.011	0.002	0.560	0.01	1.764	0.1	1.2
890.1	890	683.00	902	678.62	68.70	6.40%	8	0.011	0.003	0.580	0.01	2.330	0.1	1.6
891.1	891	705.45	892	703.45	131.00	1.50%	8	0.011	0.000	0.000	0.00	1.140	0.0	0.0
892.1	892	703.45	893	696.82	449.20	1.50%	8	0.011	0.001	0.530	0.37	1.121	0.1	55.9
893.1	893	696.82	894	690.90	91.70	6.50%	8	0.011	0.003	0.560	0.01	2.345	0.1	1.3
894.1	894	690.90	895	690.90	79.60	0.00%	8	0.011	0.003	0.090	0.15	0.000	Infinity	22.4
895.1	895	690.90	896	675.32	298.90	5.20%	8	0.011	0.004	0.590	0.01	2.107	0.2	2.0
896.1	896	675.32	897	659.25	309.70	5.20%	8	0.011	0.005	0.620	0.02	2.103	0.2	2.5
897.1	897	659.25	898	652.15	103.20	6.90%	8	0.011	0.006	0.650	0.02	2.421	0.3	2.9
898.1	898	652.15	80	651.67	188.00	0.30%	27	0.011	0.483	2.190	0.32	11.954	4.0	14.1
899.1	899	652.26	898	652.15	280.90	0.00%	27	0.011	0.419	1.250	0.43	4.681	8.9	19.2
900.1	900	654.09	899	652.26	98.10	1.90%	8	0.011	0.007	0.710	0.03	1.260	0.5	4.9
901.1	901	672.58	900	654.09	400.30	4.60%	8	0.011	0.005	0.610	0.01	1.984	0.2	2.2
902.1	902	678.62	901	672.58	182.30	3.30%	8	0.011	0.004	0.580	0.01	1.680	0.2	1.6
903.1	903	770.31	904	768.75	291.00	0.50%	8	0.011	0.006	0.690	0.18	0.676	0.9	27.7
904.1	904	768.75	905	767.62	206.50	0.50%	8	0.011	0.008	0.760	0.04	0.683	1.1	6.0
905.1	905	767.62	906	766.63	178.90	0.60%	8	0.011	0.008	0.770	0.04	0.687	1.2	6.2
906.1	906	766.63	907	766.40	76.60	0.30%	8	0.011	0.010	0.870	0.06	0.506	1.9	8.8
907.1	907	766.40	908	765.22	165.70	0.70%	8	0.011	0.010	0.780	0.04	0.779	1.3	6.0
908.1	908	765.22	909	763.94	237.30	0.50%	8	0.011	0.015	0.970	0.07	0.678	2.2	10.7
909.1	909	763.94	910	762.50	258.70	0.60%	8	0.011	0.018	0.890	0.19	0.689	2.6	29.1
910.1	910	762.50	1117	762.45	277.70	0.00%	8	0.011	0.020	0.800	0.12	0.124	16.0	17.3
911.1	911	770.93	912	769.77	210.30	0.60%	8	0.011	0.001	0.520	0.00	0.686	0.1	0.5
912.1	912	769.77	913	768.46	244.10	0.50%	8	0.011	0.001	0.530	0.00	0.676	0.1	0.6
913.1	913	768.46	910	762.50	131.30	4.50%	8	0.011	0.002	0.540	0.00	1.966	0.1	0.7
914.1	914	766.09	909	763.94	216.10	1.00%	8	0.011	0.002	0.540	0.01	0.921	0.2	0.8
915.1	915	768.26	914	766.09	416.20	0.50%	8	0.011	0.001	0.520	0.00	0.666	0.1	0.6
916.1	916	769.16	915	768.26	162.80	0.60%	8	0.011	0.000	0.190	0.00	0.686	0.0	0.4
917.1	917	771.28	908	765.22	154.50	3.90%	8	0.011	0.000	0.520	0.00	1.828	0.0	0.5
918.1	918	774.57	920	772.34	207.90	1.10%	8	0.011	0.001	0.520	0.00	0.956	0.0	0.5
919.1	919	774.63	920	772.34	218.30	1.00%	8	0.011	0.000	0.370	0.00	0.945	0.0	0.4
920.1	920	772.34	921	771.61	190.90	0.40%	8	0.011	0.002	0.540	0.00	0.571	0.3	0.7
921.1	921	771.61	922	771.18	65.80	0.70%	8	0.011	0.002	0.570	0.01	0.746	0.3	1.5

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
922.1	922	771.18	923	769.88	241.60	0.50%	8	0.011	0.002	0.570	0.01	0.677	0.3	1.5
923.1	923	769.88	926	768.39	276.80	0.50%	8	0.011	0.003	0.580	0.16	0.677	0.4	24.0
924.1	924	772.09	925	771.24	150.80	0.60%	8	0.011	0.000	0.310	0.00	0.693	0.0	0.4
925.1	925	771.24	926	768.39	150.90	1.90%	8	0.011	0.001	0.520	0.00	1.269	0.1	0.6
926.1	926	768.39	927	767.70	121.10	0.60%	8	0.011	0.004	0.630	0.02	0.697	0.6	3.0
927.1	927	767.70	908	765.22	103.30	2.40%	8	0.011	0.004	0.600	0.01	1.430	0.3	2.1
928.1	928	777.02	929	773.15	198.60	1.90%	8	0.011	0.000	0.430	0.00	1.288	0.0	0.5
929.1	929	773.15	906	766.63	227.90	2.90%	8	0.011	0.001	0.530	0.00	1.561	0.1	0.6
930.1	930	785.07	931	783.83	153.10	0.80%	8	0.011	0.000	0.430	0.00	0.831	0.0	0.5
931.1	931	783.83	903	770.31	313.20	4.30%	8	0.011	0.002	0.560	0.01	1.918	0.1	1.2
932.1	932	785.98	933	785.52	70.50	0.70%	8	0.011	0.001	0.520	0.00	0.745	0.1	0.5
933.1	933	785.52	934	784.53	177.90	0.60%	8	0.011	0.001	0.530	0.00	0.689	0.1	0.6
934.1	934	784.53	931	783.83	119.70	0.60%	8	0.011	0.001	0.530	0.00	0.706	0.2	0.7
935.1	935	781.37	936	780.71	112.70	0.60%	8	0.011	0.000	0.520	0.00	0.707	0.1	0.5
936.1	936	780.71	937	780.12	98.40	0.60%	8	0.011	0.001	0.520	0.00	0.715	0.1	0.6
937.1	937	780.12	1101	779.00	106.50	1.10%	8	0.011	0.001	0.530	0.00	0.946	0.1	0.7
938.1	938	668.45	453	666.79	103.30	1.60%	21	0.011	0.643	3.910	0.28	15.340	4.2	16.2
939.1	939	670.03	938	668.45	151.30	1.00%	10	0.012	0.043	1.410	0.12	1.568	2.7	13.8
940.1	940	670.28	939	670.03	60.60	0.40%	10	0.012	0.043	1.040	0.15	0.985	4.3	17.4
941.1	941	671.08	940	670.28	281.10	0.30%	10	0.012	0.036	0.810	0.23	0.818	4.4	27.9
942.1	942	671.88	941	671.08	279.70	0.30%	10	0.012	0.029	0.740	0.22	0.820	3.6	26.5
943.1	943	673.41	942	671.88	143.80	1.10%	10	0.012	0.024	1.110	0.09	1.582	1.5	10.3
944.1	944	675.05	943	673.41	169.90	1.00%	10	0.012	0.022	1.090	0.08	1.507	1.5	10.0
945.1	945	676.33	944	675.05	474.20	0.30%	10	0.012	0.019	0.840	0.17	0.797	2.3	20.0
946.1	946	673.09	940	670.28	473.40	0.60%	8	0.012	0.001	0.530	0.16	0.652	0.1	24.1
947.1	947	674.19	941	671.08	473.00	0.70%	8	0.012	0.001	0.530	0.18	0.686	0.1	26.6
948.1	948	673.16	942	671.88	474.00	0.30%	8	0.012	0.001	0.530	0.08	0.440	0.2	11.3
949.1	949	678.23	957	676.66	343.00	0.50%	8	0.012	0.004	0.590	0.01	0.572	0.6	1.9
950.1	950	679.33	949	678.23	261.30	0.40%	8	0.012	0.002	0.540	0.11	0.549	0.3	17.2
951.1	951	679.75	954	678.72	86.20	1.20%	8	0.012	0.007	0.680	0.02	0.925	0.8	3.7
952.1	952	684.55	951	679.75	427.40	1.10%	8	0.012	0.003	0.560	0.01	0.897	0.3	1.2
953.1	953	679.54	954	678.72	134.10	0.60%	8	0.012	0.001	0.530	0.00	0.662	0.2	0.7
954.1	954	678.72	955	678.08	95.10	0.70%	10	0.012	0.010	0.830	0.05	1.259	0.8	6.1
955.1	955	678.08	956	676.99	203.40	0.50%	10	0.012	0.010	0.730	0.03	1.123	0.9	3.5
956.1	956	676.99	957	676.66	90.50	0.40%	10	0.012	0.012	0.840	0.05	0.926	1.3	5.9
957.1	957	676.66	945	676.33	92.90	0.40%	10	0.012	0.018	1.030	0.08	0.914	2.0	9.8
958.1	958	675.09	959	673.65	285.60	0.50%	8	0.011	0.000	0.000	0.14	0.655	0.0	21.6
959.1	959	673.65	960	670.45	229.60	1.40%	8	0.011	0.000	0.000	0.00	1.090	0.0	0.0
960.1	960	670.45	938	668.45	233.60	0.90%	8	0.011	0.036	1.340	0.12	0.854	4.2	17.5
961.1	961	655.67	963	654.37	330.30	0.40%	8	0.011	0.032	0.940	0.14	0.579	5.6	20.9

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
962.1	962	655.50	963	654.37	261.50	0.40%	8	0.011	0.003	0.550	0.12	0.607	0.4	17.8
963.1	963	654.37	2438	651.80	333.20	0.80%	8	0.011	0.039	1.320	0.12	0.811	4.7	18.7
964.1	964	649.45	965	644.91	161.50	2.80%	8	0.011	0.002	0.550	0.01	1.547	0.1	0.9
965.1	965	644.91	968	629.71	378.50	4.00%	10	0.011	0.133	2.130	0.83	3.354	4.0	100.0
966.1	966	625.59	LS_SRP1	623.99	60.90	2.60%	10	0.011	0.137	1.970	0.08	2.712	5.1	9.8
967.1	967	627.75	966	625.59	209.60	1.00%	10	0.011	0.137	2.420	0.17	1.699	8.1	20.6
968.1	968	629.71	967	627.75	183.00	1.10%	10	0.011	0.137	2.410	0.17	1.732	7.9	20.4
969.1	969	650.05	965	644.91	365.50	1.40%	10	0.011	0.128	2.260	0.52	1.985	6.5	62.6
970.1	970	651.42	969	650.05	426.20	0.30%	10	0.011	0.120	1.630	0.22	0.949	12.6	26.2
971.1	971	653.80	2438	651.80	277.90	0.70%	10	0.011	0.077	1.770	0.35	1.420	5.4	42.0
972.1	972	654.67	971	653.80	287.60	0.30%	10	0.011	0.075	1.300	0.27	0.920	8.2	32.5
973.1	973	657.65	972	654.67	405.10	0.70%	8	0.011	0.006	0.240	0.11	0.792	0.7	16.2
974.1	974	659.31	973	657.65	265.70	0.60%	8	0.011	0.003	0.620	0.18	0.730	0.5	27.6
975.1	975	655.06	972	654.67	57.10	0.70%	8	0.011	0.000	0.000	0.00	0.763	0.0	0.0
976.1	976	666.53	977	660.40	219.40	2.80%	8	0.011	0.004	0.590	0.01	1.543	0.3	1.8
977.1	977	660.40	978	656.27	400.10	1.00%	8	0.011	0.006	0.640	0.02	0.938	0.6	3.0
978.1	978	656.27	972	654.67	304.20	0.50%	10	0.011	0.058	1.420	0.14	1.214	4.8	17.3
979.1	979	659.07	978	656.27	361.00	0.80%	10	0.011	0.046	1.430	0.32	1.474	3.1	38.6
980.1	980	723.85	981	721.47	445.50	0.50%	10	0.011	0.132	2.180	0.19	1.223	10.8	22.7
981.1	981	721.47	1843	711.94	93.80	10.20%	10	0.011	0.226	2.850	0.12	5.334	4.2	14.4
982.1	982	688.02	983	677.81	500.00	2.00%	10	0.011	0.315	4.030	0.22	2.392	13.2	26.1
983.1	983	677.81	984	663.14	267.60	5.50%	10	0.011	0.271	3.420	0.83	3.918	6.9	100.0
984.1	984	663.14	12	653.54	356.40	2.70%	12	0.011	0.231	3.070	0.84	4.466	5.2	84.3
985.1	985	656.99	1421	656.57	94.40	0.40%	8	0.011	0.005	0.670	0.03	0.616	0.8	3.8
986.1	986	686.84	49	667.50	486.60	4.00%	8	0.011	0.002	0.540	0.67	1.840	0.1	100.0
987.1	987	700.92	48	694.42	266.70	2.40%	8	0.011	0.000	0.000	0.65	1.441	0.0	97.5
988.1	988	684.34	996	675.76	98.90	8.70%	8	0.011	0.003	0.570	0.01	2.718	0.1	1.3
989.1	989	709.12	988	684.34	351.00	7.10%	8	0.011	0.001	0.530	0.67	2.452	0.1	100.0
990.1	990	709.12	989	709.12	240.20	0.00%	8	0.011	0.000	0.010	0.18	0.000	Infinity	26.3
991.1	991	718.80	63	695.01	357.70	6.60%	8	0.011	0.000	0.000	0.67	2.380	0.0	100.0
992.1	992	711.30	993	700.28	494.10	2.20%	8	0.011	0.000	0.340	0.62	1.378	0.0	92.3
993.1	993	700.28	994	693.77	124.70	5.20%	8	0.011	0.002	0.560	0.01	2.109	0.1	1.3
994.1	994	693.77	995	686.80	126.40	5.50%	8	0.011	0.003	0.580	0.01	2.168	0.1	1.6
995.1	995	686.80	996	675.76	170.70	6.50%	8	0.011	0.004	0.580	0.01	2.347	0.1	1.7
996.1	996	675.76	1421	656.57	319.30	6.00%	8	0.011	0.008	0.680	0.02	2.263	0.3	3.6
997.1	997	700.49	1017	697.90	490.60	0.50%	10	0.012	0.099	2.000	0.31	1.115	8.9	37.0
998.1	998	702.05	997	700.49	431.00	0.40%	10	0.012	0.099	1.730	0.18	0.923	10.7	21.9
999.1	999	703.85	998	702.05	481.30	0.40%	10	0.012	0.087	1.680	0.27	0.938	9.3	32.5
1000.1	1000	704.51	999	703.85	172.40	0.40%	10	0.012	0.087	1.710	0.17	0.949	9.2	20.2
1001.1	1001	705.64	1000	704.51	156.10	0.70%	8	0.012	0.084	1.910	0.15	0.720	11.6	22.8

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1002.1	1002	706.92	1001	705.64	201.80	0.60%	8	0.012	0.083	1.920	0.16	0.674	12.3	23.4
1003.1	1003	708.11	1002	706.92	218.10	0.50%	8	0.012	0.067	1.760	0.15	0.625	10.7	22.5
1004.1	1004	709.38	1003	708.11	192.30	0.70%	8	0.012	0.067	1.730	0.14	0.688	9.7	21.5
1005.1	1005	716.31	1004	709.38	462.80	1.50%	8	0.012	0.050	1.400	0.49	1.035	4.9	72.9
1006.1	1006	728.58	1005	716.31	265.60	4.60%	8	0.012	0.049	1.330	0.67	1.818	2.7	100.0
1007.1	1007	733.88	1006	728.58	250.90	2.10%	8	0.012	0.048	1.420	0.64	1.230	3.9	95.9
1008.1	1008	736.09	1007	733.88	163.70	1.40%	8	0.012	0.048	1.460	0.12	0.983	4.8	17.7
1009.1	1009	738.36	1008	736.09	258.10	0.90%	8	0.012	0.047	1.470	0.36	0.794	6.0	54.1
1010.1	1010	741.59	1009	738.36	455.20	0.70%	8	0.012	0.042	1.280	0.31	0.713	5.9	47.2
1011.1	1011	743.20	1010	741.59	298.00	0.50%	8	0.012	0.042	1.170	0.14	0.622	6.8	21.7
1012.1	1012	744.20	1011	743.20	192.10	0.50%	8	0.012	0.042	1.160	0.15	0.611	6.9	21.8
1013.1	1013	746.20	1012	744.20	433.70	0.50%	8	0.012	0.042	1.110	0.15	0.575	7.3	22.5
1014.1	1014	746.79	1013	746.20	145.30	0.40%	8	0.012	0.042	1.060	0.15	0.539	7.8	23.2
1015.1	1015	747.97	1014	746.79	328.70	0.40%	8	0.012	0.042	0.990	0.16	0.507	8.3	24.3
1016.1	1016	748.65	1015	747.97	91.60	0.70%	8	0.012	0.042	1.300	0.13	0.729	5.8	20.1
1017.1	1017	697.90	1018	697.09	406.60	0.20%	21	0.011	0.181	1.510	0.23	5.402	3.4	13.1
1018.1	1018	697.09	1019	695.99	415.00	0.30%	21	0.011	0.181	1.680	0.21	6.231	2.9	12.2
1019.1	1019	695.99	1020	694.90	415.00	0.30%	21	0.011	0.181	1.670	0.21	6.203	2.9	12.2
1020.1	1020	694.90	2158	693.28	409.70	0.40%	21	0.011	0.181	1.920	0.19	7.610	2.4	11.1
1021.1	1021	694.63	2158	693.28	41.90	3.20%	12	0.011	0.193	2.700	0.14	4.886	3.9	14.2
1022.1	1022	691.19	1025	689.55	313.00	0.50%	8	0.011	0.011	0.850	0.05	0.668	1.6	8.0
1023.1	1023	692.49	1022	691.19	245.00	0.50%	8	0.011	0.000	0.000	0.00	0.672	0.0	0.0
1024.1	1024	693.13	1025	689.55	146.10	2.40%	8	0.011	0.000	0.000	0.00	1.445	0.0	0.0
1025.1	1025	689.55	1031	683.52	300.00	2.00%	8	0.011	0.016	0.890	0.05	1.309	1.2	8.1
1026.1	1026	679.20	1033	673.36	232.10	2.50%	8	0.011	0.000	0.000	0.00	1.464	0.0	0.0
1027.1	1027	680.53	2442	666.41	398.20	3.50%	8	0.011	0.021	0.980	0.06	1.738	1.2	9.5
1028.1	1028	675.57	1034	667.19	261.80	3.20%	8	0.011	0.000	0.000	0.67	1.651	0.0	100.0
1029.1	1029	676.28	1032	668.75	242.80	3.10%	8	0.011	0.000	0.000	0.00	1.625	0.0	0.0
1030.1	1030	682.61	1027	680.53	398.20	0.50%	8	0.011	0.019	1.070	0.09	0.667	2.8	12.9
1031.1	1031	683.52	1030	682.61	167.50	0.50%	8	0.011	0.018	1.050	0.08	0.680	2.6	12.5
1032.1	1032	668.75	1034	667.19	299.10	0.50%	8	0.011	0.010	0.830	0.05	0.667	1.5	7.5
1033.1	1033	673.36	1032	668.75	300.00	1.50%	8	0.011	0.005	0.630	0.02	1.144	0.5	2.6
1034.1	1034	667.19	1041	664.97	236.40	0.90%	8	0.011	0.013	0.830	0.05	0.894	1.4	6.9
1035.1	1035	681.55	1033	673.36	300.80	2.70%	8	0.011	0.000	0.000	0.00	1.523	0.0	0.0
1036.1	1036	687.12	1037	680.39	399.80	1.70%	8	0.011	0.000	0.000	0.00	1.198	0.0	0.0
1037.1	1037	680.39	1039	674.27	397.00	1.50%	8	0.011	0.002	0.540	0.44	1.146	0.2	66.4
1038.1	1038	675.60	1032	668.75	301.80	2.30%	8	0.011	0.000	0.000	0.00	1.391	0.0	0.0
1039.1	1039	674.27	1041	664.97	140.80	6.60%	8	0.011	0.004	0.600	0.01	2.372	0.2	2.1
1040.1	1040	678.06	1039	674.27	150.30	2.50%	8	0.011	0.000	0.000	0.00	1.466	0.0	0.0
1041.1	1041	664.97	1072	658.52	324.20	2.00%	8	0.011	0.020	1.010	0.07	1.302	1.6	10.5

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1042.1	1042	739.84	1043	733.20	267.90	2.50%	8	0.012	0.002	0.540	0.67	1.332	0.1	100.0
1043.1	1043	733.20	1044	731.44	230.40	0.80%	8	0.012	0.003	0.580	0.01	0.740	0.4	1.7
1044.1	1044	731.44	1051	724.55	520.70	1.30%	8	0.012	0.003	0.560	0.01	0.973	0.3	0.9
1045.1	1045	746.17	1046	733.72	460.40	2.70%	8	0.012	0.000	0.390	0.67	1.391	0.0	100.0
1046.1	1046	733.72	1048	727.47	276.70	2.30%	8	0.012	0.003	0.590	0.64	1.272	0.2	95.8
1047.1	1047	743.51	1048	727.47	392.80	4.10%	8	0.012	0.001	0.520	0.67	1.710	0.0	100.0
1048.1	1048	727.47	1058	726.23	251.30	0.50%	8	0.012	0.002	0.620	0.15	0.594	0.3	21.8
1048.2	1048	727.47	1049	723.49	262.10	1.50%	8	0.012	0.004	0.560	0.40	1.043	0.4	60.7
1049.1	1049	723.49	1050	719.98	267.70	1.30%	8	0.012	0.004	0.560	0.36	0.969	0.4	53.6
1050.1	1050	719.98	1054	719.30	129.20	0.50%	8	0.012	0.010	0.840	0.05	0.614	1.7	7.8
1051.1	1051	724.55	1050	719.98	269.10	1.70%	8	0.012	0.006	0.580	0.47	1.103	0.5	69.8
1052.1	1052	730.13	1051	724.55	361.90	1.50%	8	0.012	0.000	0.120	0.40	1.051	0.0	60.1
1053.1	1053	718.97	1181	717.39	148.10	1.10%	8	0.012	0.011	0.770	0.04	0.874	1.2	5.8
1054.1	1054	719.30	1053	718.97	64.80	0.50%	8	0.012	0.011	0.860	0.06	0.604	1.7	8.4
1055.1	1055	720.03	1061	716.37	388.50	0.90%	8	0.012	0.002	0.560	0.27	0.821	0.3	40.4
1056.1	1056	727.57	1055	720.03	224.60	3.40%	8	0.012	0.000	0.200	0.00	1.550	0.0	0.4
1057.1	1057	721.00	1055	720.03	174.90	0.60%	8	0.012	0.001	0.530	0.00	0.630	0.1	0.6
1058.1	1058	726.23	1059	724.55	295.90	0.60%	8	0.012	0.009	0.790	0.21	0.638	1.4	31.9
1059.1	1059	724.55	1060	724.29	32.70	0.80%	8	0.012	0.010	0.790	0.04	0.755	1.3	6.5
1060.1	1060	724.29	1005	716.31	401.40	2.00%	8	0.012	0.000	0.000	0.00	1.193	0.0	0.0
1060.2	1060	724.29	1061	716.37	320.40	2.50%	8	0.012	0.010	0.640	0.01	1.330	0.7	2.0
1061.1	1061	716.37	1062	712.13	414.80	1.00%	8	0.012	0.013	0.750	0.03	0.855	1.5	4.5
1062.1	1062	712.13	1002	706.92	251.70	2.10%	8	0.012	0.014	0.790	0.56	1.217	1.2	83.6
1063.1	1063	721.02	1064	718.90	130.70	1.60%	8	0.012	0.000	0.200	0.00	1.077	0.0	0.4
1064.1	1064	718.90	1065	715.12	245.80	1.50%	8	0.012	0.001	0.530	0.00	1.049	0.1	0.6
1065.1	1065	715.12	1000	704.51	280.10	3.80%	8	0.012	0.002	0.540	0.67	1.647	0.1	100.0
1066.1	1066	684.52	1067	682.45	217.70	1.00%	8	0.011	0.005	0.620	0.02	0.900	0.5	2.4
1067.1	1067	682.45	2442	666.41	140.90	11.40%	8	0.011	0.007	0.630	0.02	3.114	0.2	2.3
1068.1	1068	665.15	979	659.07	308.60	2.00%	8	0.011	0.036	1.260	0.10	1.296	2.8	14.6
1069.1	1069	665.73	1068	665.15	149.10	0.40%	8	0.011	0.001	0.530	0.00	0.576	0.2	0.7
1070.1	1070	675.77	1071	669.14	324.60	2.00%	8	0.011	0.003	0.600	0.02	1.319	0.2	2.3
1071.1	1071	669.14	979	659.07	396.90	2.50%	8	0.011	0.005	0.630	0.67	1.470	0.4	100.0
1072.1	1072	658.52	2476	656.02	309.10	0.80%	8	0.011	0.025	1.190	0.10	0.830	3.0	14.9
1073.1	1073	674.98	1072	658.52	379.00	4.30%	8	0.011	0.001	0.530	0.67	1.923	0.1	100.0
1074.1	1074	672.40	1075	668.01	488.10	0.90%	8	0.011	0.000	0.000	0.24	0.875	0.0	36.6
1075.1	1075	668.01	961	655.67	410.50	3.00%	8	0.011	0.003	0.570	0.01	1.600	0.2	1.3
1076.1	1076	671.00	1075	668.01	91.70	3.30%	8	0.011	0.000	0.000	0.00	1.667	0.0	0.0
1077.1	1077	667.50	1078	656.03	272.70	4.20%	8	0.011	0.001	0.530	0.67	1.893	0.1	100.0
1078.1	1078	656.03	969	650.05	263.60	2.30%	8	0.011	0.003	0.610	0.62	1.390	0.2	92.3
1079.1	1079	779.00	1080	775.00	171.40	2.30%	8	0.011	0.000	0.000	0.00	1.410	0.0	0.0

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1080.1	1080	775.00	1081	773.40	291.50	0.50%	8	0.011	0.002	0.540	0.17	0.684	0.2	24.8
1081.1	1081	773.40	1086	772.00	206.00	0.70%	8	0.011	0.003	0.600	0.01	0.761	0.4	2.1
1082.1	1082	764.00	1087	762.40	227.60	0.70%	8	0.011	0.005	0.630	0.02	0.774	0.6	2.9
1083.1	1083	766.00	1082	764.00	167.00	1.20%	8	0.011	0.005	0.610	0.01	1.010	0.5	2.2
1084.1	1084	767.00	1083	766.00	62.30	1.60%	8	0.011	0.004	0.640	0.02	1.169	0.3	3.3
1085.1	1085	769.00	1084	767.00	153.20	1.30%	8	0.011	0.004	0.590	0.01	1.055	0.4	1.7
1086.1	1086	772.00	1085	769.00	193.40	1.60%	8	0.011	0.004	0.640	0.02	1.150	0.4	3.4
1087.1	1087	762.40	1088	758.00	216.30	2.00%	8	0.011	0.005	0.690	0.03	1.316	0.4	4.6
1088.1	1088	758.00	1089	756.40	282.50	0.60%	8	0.011	0.006	0.660	0.18	0.695	0.8	27.4
1089.1	1089	756.40	1090	754.40	130.10	1.50%	8	0.011	0.040	1.330	0.10	1.145	3.5	15.6
1090.1	1090	754.40	1091	752.40	120.30	1.70%	8	0.011	0.040	1.320	0.10	1.190	3.4	15.4
1091.1	1091	752.40	1092	745.73	195.90	3.40%	12	0.011	0.042	1.220	0.08	5.022	0.8	7.9
1092.1	1092	745.73	1094	743.88	179.20	1.00%	12	0.011	0.072	1.690	0.13	2.765	2.6	12.6
1093.1	1093	748.00	1092	745.73	249.90	0.90%	8	0.011	0.030	1.230	0.34	0.880	3.4	50.6
1094.1	1094	743.88	1132	739.22	466.90	1.00%	12	0.011	0.073	1.700	0.39	2.719	2.7	38.7
1095.1	1095	761.00	1096	757.00	277.60	1.40%	8	0.011	0.000	0.000	0.40	1.108	0.0	60.0
1096.1	1096	757.00	1091	752.40	450.40	1.00%	8	0.011	0.001	0.530	0.26	0.933	0.1	39.0
1097.1	1097	779.00	1099	777.90	74.10	1.50%	8	0.011	0.000	0.000	0.00	1.125	0.0	0.0
1098.1	1098	780.00	1099	777.90	176.70	1.20%	8	0.011	0.001	0.520	0.00	1.006	0.0	0.5
1099.1	1099	777.90	1100	776.69	223.30	0.50%	8	0.011	0.001	0.530	0.00	0.679	0.1	0.7
1100.1	1100	776.69	1103	776.11	96.00	0.60%	8	0.011	0.003	0.580	0.01	0.718	0.4	1.9
1101.1	1101	779.00	1100	776.69	160.40	1.40%	8	0.011	0.001	0.530	0.00	1.108	0.1	0.7
1102.1	1102	779.00	1105	774.00	164.50	3.00%	8	0.011	0.000	0.190	0.00	1.609	0.0	0.4
1103.1	1103	776.11	1104	774.80	242.60	0.50%	8	0.011	0.003	0.630	0.02	0.678	0.4	3.1
1104.1	1104	774.80	1105	774.00	132.40	0.60%	8	0.011	0.003	0.640	0.02	0.717	0.4	3.3
1105.1	1105	774.00	1106	772.31	312.50	0.50%	8	0.011	0.004	0.620	0.02	0.679	0.6	2.8
1106.1	1106	772.31	1108	771.60	122.50	0.60%	8	0.011	0.005	0.670	0.03	0.703	0.8	3.8
1107.1	1107	775.00	1106	772.31	168.20	1.60%	8	0.011	0.001	0.520	0.00	1.167	0.1	0.6
1108.1	1108	771.60	1109	770.63	171.80	0.60%	8	0.011	0.005	0.710	0.03	0.694	0.8	5.2
1109.1	1109	770.63	1110	769.57	192.00	0.60%	8	0.011	0.006	0.730	0.04	0.686	0.9	5.5
1110.1	1110	769.57	1111	763.90	301.30	1.90%	8	0.011	0.006	0.660	0.02	1.266	0.5	3.2
1111.1	1111	763.90	1112	763.21	119.10	0.60%	8	0.011	0.007	0.740	0.04	0.703	1.0	5.7
1112.1	1112	763.21	1113	761.80	255.50	0.60%	8	0.011	0.008	0.640	0.16	0.686	1.1	23.6
1113.1	1113	761.80	1114	761.00	92.90	0.90%	8	0.011	0.029	1.250	0.11	0.857	3.4	15.8
1114.1	1114	761.00	1120	759.00	386.00	0.50%	8	0.011	0.030	0.990	0.27	0.664	4.5	40.4
1115.1	1115	772.00	1112	763.21	85.00	10.30%	8	0.011	0.000	0.490	0.00	2.968	0.0	0.5
1116.1	1116	762.20	1113	761.80	144.70	0.30%	8	0.011	0.021	0.820	0.11	0.485	4.4	17.1
1117.1	1117	762.45	1116	762.20	187.30	0.10%	8	0.011	0.021	0.600	0.14	0.337	6.1	20.9
1118.1	1118	770.00	1119	768.90	420.70	0.30%	8	0.011	0.000	0.490	0.00	0.472	0.1	0.5
1119.1	1119	768.90	1120	759.00	362.00	2.70%	8	0.011	0.001	0.530	0.67	1.526	0.1	100.0

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1120.1	1120	759.00	1121	757.90	137.90	0.80%	8	0.011	0.033	1.240	0.12	0.824	4.0	17.4
1121.1	1121	757.90	1089	756.40	265.90	0.60%	8	0.011	0.033	1.110	0.28	0.693	4.8	41.5
1122.1	1122	764.85	1087	762.40	87.70	2.80%	8	0.011	0.000	0.250	0.00	1.543	0.0	0.4
1123.1	1123	770.06	1083	766.00	225.00	1.80%	8	0.011	0.000	0.190	0.00	1.240	0.0	0.4
1124.1	1124	780.00	1125	778.90	130.10	0.80%	8	0.011	0.000	0.190	0.00	0.849	0.0	0.4
1125.1	1125	778.90	1126	776.48	196.20	1.20%	8	0.011	0.001	0.520	0.00	1.025	0.0	0.5
1126.1	1126	776.48	1081	773.40	60.60	5.10%	8	0.011	0.001	0.530	0.00	2.080	0.0	0.6
1127.1	1127	780.00	1128	779.00	165.60	0.60%	8	0.011	0.000	0.490	0.00	0.717	0.1	0.5
1128.1	1128	779.00	1080	775.00	313.10	1.30%	8	0.011	0.001	0.530	0.00	1.043	0.1	0.6
1129.1	1129	727.76	1135	723.65	400.40	1.00%	12	0.012	0.074	1.730	0.13	2.527	2.9	13.3
1130.1	1130	729.83	1129	727.76	197.90	1.00%	12	0.011	0.073	1.700	0.13	2.783	2.6	12.7
1131.1	1131	734.44	1130	729.83	452.10	1.00%	12	0.011	0.073	1.710	0.38	2.748	2.7	38.4
1132.1	1132	739.22	1131	734.44	456.20	1.00%	12	0.011	0.073	1.700	0.39	2.785	2.6	39.2
1133.1	1133	716.32	2063	714.67	13.20	12.50%	12	0.012	0.074	1.440	0.07	8.830	0.8	7.3
1134.1	1134	719.64	1133	716.32	302.70	1.10%	12	0.012	0.074	1.730	0.13	2.612	2.8	13.2
1135.1	1135	723.65	1134	719.64	398.30	1.00%	12	0.012	0.074	1.740	0.13	2.503	2.9	13.3
1136.1	1136	740.04	150	729.80	480.90	2.10%	8	0.013	0.002	0.570	0.58	1.140	0.2	86.9
1137.1	1137	735.43	149	725.31	478.10	2.10%	8	0.013	0.004	0.580	0.57	1.136	0.4	85.9
1138.1	1138	724.06	LS_BM	712.50	116.10	10.00%	8	0.013	0.012	0.860	0.05	2.464	0.5	7.9
1139.1	1139	741.73	156	741.50	36.70	0.60%	8	0.013	0.009	0.800	0.05	0.618	1.4	7.1
1140.1	1140	772.17	1142	771.51	112.00	0.60%	6	0.013	0.000	0.000	0.00	0.278	0.0	0.0
1141.1	1141	770.64	321	770.16	94.30	0.50%	6	0.013	0.000	0.000	0.00	0.259	0.0	0.0
1142.1	1142	771.51	1141	770.64	155.00	0.60%	6	0.013	0.000	0.000	0.00	0.272	0.0	0.0
1143.1	1143	713.50	1144	712.56	280.30	0.30%	12	0.012	0.168	1.740	0.34	1.445	11.6	34.0
1144.1	1144	712.56	1145	711.01	169.80	0.90%	12	0.012	0.169	2.500	0.19	2.384	7.1	19.1
1145.1	1145	711.01	1146	707.80	409.90	0.80%	12	0.012	0.169	2.360	0.20	2.207	7.7	19.9
1146.1	1146	707.80	1147	706.48	215.30	0.60%	12	0.012	0.170	2.170	0.21	1.953	8.7	21.2
1147.1	1147	706.48	1148	705.50	201.10	0.50%	12	0.012	0.171	2.000	0.22	1.741	9.8	22.5
1148.1	1148	705.50	1149	704.49	191.20	0.50%	12	0.012	0.172	2.060	0.22	1.813	9.5	22.1
1149.1	1149	704.49	2437	701.89	299.50	0.90%	12	0.012	0.174	2.450	0.20	2.324	7.5	19.7
1150.1	1150	703.60	2160	699.48	499.30	0.80%	12	0.011	0.034	1.220	0.10	2.472	1.4	10.3
1151.1	1151	707.94	2162	707.40	108.90	0.50%	8	0.012	0.014	0.970	0.07	0.596	2.4	10.8
1152.1	1152	708.73	1151	707.94	138.40	0.60%	8	0.012	0.014	0.960	0.07	0.639	2.3	10.4
1153.1	1153	710.40	1152	708.73	318.60	0.50%	8	0.012	0.004	0.680	0.03	0.613	0.7	4.3
1154.1	1154	711.01	1153	710.40	96.40	0.60%	8	0.012	0.004	0.630	0.02	0.673	0.6	3.0
1155.1	1155	711.69	1154	711.01	120.70	0.60%	8	0.012	0.000	0.520	0.00	0.635	0.1	0.5
1156.1	1156	710.29	1152	708.73	291.50	0.50%	8	0.012	0.009	0.820	0.21	0.619	1.5	31.0
1157.1	1157	711.63	1156	710.29	247.70	0.50%	8	0.012	0.006	0.740	0.17	0.622	1.0	25.7
1158.1	1158	712.72	1157	711.63	198.20	0.50%	8	0.012	0.003	0.610	0.02	0.627	0.4	2.5
1159.1	1159	713.89	1158	712.72	213.50	0.50%	8	0.012	0.002	0.550	0.01	0.626	0.4	1.0

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1160.1	1160	715.08	1159	713.89	212.50	0.60%	8	0.012	0.002	0.540	0.00	0.633	0.3	0.7
1161.1	1161	714.77	1162	713.80	174.40	0.60%	8	0.012	0.001	0.520	0.00	0.631	0.1	0.5
1162.1	1162	713.80	1157	711.63	414.60	0.50%	8	0.012	0.003	0.610	0.02	0.612	0.4	2.8
1163.1	1163	720.73	1162	713.80	283.80	2.40%	8	0.012	0.001	0.530	0.67	1.322	0.1	100.0
1164.1	1164	728.51	1163	720.73	128.60	6.00%	8	0.012	0.001	0.530	0.00	2.081	0.0	0.7
1165.1	1165	727.63	1166	722.83	235.50	2.00%	8	0.012	0.000	0.250	0.00	1.208	0.0	0.4
1166.1	1166	722.83	1160	715.08	335.90	2.30%	8	0.012	0.001	0.530	0.00	1.285	0.1	0.6
1167.1	1167	733.42	1164	728.51	480.80	1.00%	8	0.012	0.000	0.250	0.28	0.855	0.0	41.3
1168.1	1168	704.20	1150	703.60	163.60	0.40%	12	0.012	0.019	0.970	0.08	1.511	1.2	8.1
1169.1	1169	704.98	1168	704.20	224.90	0.30%	12	0.012	0.019	1.000	0.08	1.469	1.3	7.9
1170.1	1170	707.60	1169	704.98	128.30	2.00%	8	0.012	0.000	0.310	0.00	1.209	0.0	0.4
1171.1	1171	706.45	1169	704.98	463.20	0.30%	12	0.012	0.017	0.800	0.17	1.405	1.2	16.8
1172.1	1172	707.66	1171	706.45	370.40	0.30%	12	0.012	0.016	0.920	0.16	1.426	1.1	16.3
1173.1	1173	709.15	1172	707.66	290.90	0.50%	8	0.012	0.016	1.010	0.23	0.606	2.6	34.3
1174.1	1174	715.80	1173	709.15	95.50	7.00%	8	0.012	0.000	0.250	0.00	2.232	0.0	0.4
1175.1	1175	712.51	1154	711.01	281.60	0.50%	8	0.012	0.003	0.620	0.17	0.618	0.5	25.4
1176.1	1176	717.50	1175	712.51	112.10	4.50%	8	0.012	0.000	0.250	0.00	1.785	0.0	0.4
1177.1	1177	729.50	1184	718.50	326.20	3.40%	8	0.012	0.000	0.430	0.00	1.554	0.0	0.5
1178.1	1178	728.50	1179	713.25	378.70	4.00%	8	0.012	0.000	0.310	0.67	1.698	0.0	100.0
1179.1	1179	713.25	1156	710.29	570.90	0.50%	8	0.012	0.001	0.530	0.14	0.609	0.2	20.9
1180.1	1180	716.73	1183	710.96	572.40	1.00%	8	0.012	0.012	0.810	0.31	0.850	1.4	46.0
1181.1	1181	717.39	1180	716.73	110.20	0.60%	8	0.012	0.011	0.850	0.05	0.655	1.6	8.0
1182.1	1182	714.69	1183	710.96	192.50	1.90%	8	0.012	0.001	0.530	0.00	1.178	0.1	0.6
1183.1	1183	710.96	1173	709.15	427.50	0.40%	8	0.012	0.014	0.980	0.07	0.551	2.6	11.1
1184.1	1184	718.50	1175	712.51	211.90	2.80%	8	0.012	0.002	0.550	0.01	1.422	0.1	0.9
1185.1	1185	708.78	1172	707.66	203.00	0.60%	8	0.012	0.000	0.060	0.00	0.628	0.0	0.3
1186.1	1186	711.21	1192	708.89	463.30	0.50%	8	0.012	0.002	0.540	0.13	0.599	0.3	20.1
1187.1	1187	713.00	1186	711.21	278.10	0.60%	8	0.012	0.000	0.390	0.18	0.679	0.0	27.3
1188.1	1188	724.00	1184	718.50	214.10	2.60%	8	0.012	0.001	0.530	0.00	1.356	0.1	0.6
1189.1	1189	729.00	1188	724.00	302.80	1.70%	8	0.012	0.000	0.250	0.00	1.087	0.0	0.4
1190.1	1190	731.00	1180	716.73	366.10	3.90%	8	0.012	0.000	0.370	0.67	1.670	0.0	100.0
1191.1	1191	706.58	998	702.05	176.70	2.60%	8	0.012	0.012	0.820	0.05	1.355	0.9	6.9
1192.1	1192	708.89	1191	706.58	444.60	0.50%	8	0.012	0.003	0.620	0.02	0.610	0.5	2.8
1193.1	1193	710.54	1194	708.63	124.70	1.50%	8	0.012	0.001	0.530	0.00	1.047	0.1	0.6
1194.1	1194	708.63	1191	706.58	234.70	0.90%	8	0.012	0.006	0.660	0.02	0.791	0.7	3.6
1195.1	1195	717.00	1196	712.60	221.10	2.00%	8	0.012	0.000	0.390	0.00	1.194	0.0	0.4
1196.1	1196	712.60	1197	710.07	300.10	0.80%	8	0.012	0.002	0.540	0.00	0.777	0.2	0.7
1197.1	1197	710.07	1194	708.63	267.20	0.50%	8	0.012	0.004	0.660	0.17	0.621	0.6	25.4
1198.1	1198	713.41	1183	710.96	468.10	0.50%	8	0.012	0.000	0.190	0.14	0.612	0.0	20.8
1199.1	1199	711.02	1197	710.07	330.00	0.30%	8	0.012	0.000	0.390	0.00	0.454	0.1	0.5

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1200.1	1200	653.26	427	653.12	10.70	1.30%	8	0.012	0.149	2.600	0.19	0.968	15.4	28.5
1201.1	1201	654.78	1200	653.26	400.10	0.40%	8	0.012	0.118	1.640	0.24	0.522	22.6	35.4
1202.1	1202	656.13	1201	654.78	340.10	0.40%	8	0.012	0.118	1.660	0.23	0.533	22.1	35.1
1203.1	1203	677.12	1204	674.45	267.20	1.00%	8	0.012	0.001	0.530	0.27	0.846	0.1	40.7
1204.1	1204	674.45	1205	673.54	91.00	1.00%	8	0.012	0.003	0.570	0.01	0.846	0.3	1.4
1205.1	1205	673.54	1206	668.23	409.30	1.30%	8	0.012	0.004	0.590	0.01	0.964	0.4	1.9
1206.1	1206	668.23	1222	667.01	232.80	0.50%	8	0.012	0.013	0.920	0.06	0.612	2.1	9.6
1207.1	1207	675.84	1208	672.68	395.00	0.80%	8	0.012	0.000	0.000	0.23	0.757	0.0	33.9
1208.1	1208	672.68	1206	668.23	323.20	1.40%	8	0.012	0.003	0.560	0.01	0.993	0.3	0.9
1209.1	1209	672.99	1217	671.03	307.40	0.60%	8	0.012	0.002	0.540	0.00	0.676	0.2	0.7
1210.1	1210	672.29	1211	671.91	63.80	0.60%	8	0.012	0.000	0.500	0.00	0.653	0.1	0.5
1211.1	1211	671.91	1212	671.27	106.10	0.60%	8	0.012	0.001	0.530	0.00	0.657	0.1	0.6
1212.1	1212	671.27	1213	669.22	409.40	0.50%	8	0.012	0.003	0.600	0.02	0.599	0.4	2.4
1213.1	1213	669.22	1214	667.17	409.60	0.50%	8	0.012	0.006	0.710	0.03	0.599	1.0	5.0
1214.1	1214	667.17	1215	663.07	422.40	1.00%	8	0.012	0.009	0.750	0.04	0.834	1.1	5.3
1215.1	1215	663.07	459	661.85	127.70	1.00%	8	0.012	0.026	1.180	0.10	0.827	3.1	14.3
1216.1	1216	664.24	1215	663.07	292.30	0.40%	8	0.012	0.012	0.860	0.19	0.535	2.3	29.0
1217.1	1217	671.03	1218	669.71	352.40	0.40%	8	0.012	0.003	0.620	0.11	0.518	0.6	17.1
1218.1	1218	669.71	1219	666.44	420.10	0.80%	8	0.012	0.006	0.680	0.03	0.747	0.8	3.9
1219.1	1219	666.44	1216	664.24	299.60	0.70%	8	0.012	0.011	0.860	0.05	0.725	1.5	8.1
1220.1	1220	667.25	1219	666.44	181.90	0.40%	8	0.012	0.002	0.540	0.01	0.565	0.3	0.8
1221.1	1221	667.23	448	663.00	356.40	1.20%	8	0.012	0.001	0.520	0.31	0.922	0.1	45.9
1222.1	1222	667.01	1223	665.37	329.50	0.50%	8	0.012	0.014	0.950	0.08	0.597	2.4	11.8
1223.1	1223	665.37	468	662.83	304.40	0.80%	8	0.012	0.021	1.100	0.09	0.773	2.7	13.1
1224.1	1224	673.90	1225	666.24	195.30	3.90%	8	0.012	0.001	0.530	0.00	1.676	0.1	0.7
1225.1	1225	666.24	1226	660.52	338.40	1.70%	8	0.012	0.003	0.550	0.01	1.100	0.3	0.9
1226.1	1226	660.52	1227	659.30	71.00	1.70%	8	0.012	0.006	0.620	0.02	1.109	0.5	2.3
1227.1	1227	659.30	1228	658.07	308.50	0.40%	8	0.012	0.015	0.830	0.09	0.534	2.7	13.0
1228.1	1228	658.07	1229	656.87	299.60	0.40%	8	0.012	0.022	0.820	0.12	0.536	4.2	17.7
1229.1	1229	656.87	1230	656.35	130.40	0.40%	8	0.012	0.030	0.870	0.14	0.534	5.6	20.9
1230.1	1230	656.35	1235	655.23	283.00	0.40%	8	0.012	0.031	0.860	0.26	0.532	5.7	38.3
1231.1	1231	669.31	1233	665.18	243.70	1.70%	8	0.012	0.002	0.540	0.01	1.102	0.2	0.8
1232.1	1232	670.69	1234	664.24	293.60	2.20%	8	0.012	0.002	0.580	0.66	1.254	0.2	98.6
1233.1	1233	665.18	1228	658.07	325.00	2.20%	8	0.012	0.003	0.570	0.01	1.251	0.3	1.3
1234.1	1234	664.24	1229	656.87	275.30	2.70%	8	0.012	0.004	0.620	0.67	1.384	0.3	100.0
1235.1	1235	655.23	1200	653.26	512.50	0.40%	8	0.012	0.031	0.860	0.14	0.525	5.8	21.6
1236.1	1236	664.77	2362	663.91	185.40	0.50%	8	0.012	0.002	0.540	0.00	0.576	0.3	0.7
1237.1	1237	662.26	1238	661.93	84.40	0.40%	8	0.012	0.007	0.750	0.04	0.529	1.2	5.8
1238.1	1238	661.93	1227	659.30	289.90	0.90%	8	0.012	0.008	0.740	0.30	0.806	1.0	44.8
1239.1	1239	672.23	583	668.60	353.90	1.00%	8	0.011	0.012	0.810	0.30	0.935	1.3	45.2

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1240.1	1240	673.58	1239	672.23	257.10	0.50%	8	0.011	0.010	0.830	0.18	0.669	1.5	27.7
1241.1	1241	675.84	1240	673.58	293.30	0.80%	8	0.011	0.008	0.740	0.26	0.810	1.0	39.3
1242.1	1242	692.62	1241	675.84	400.20	4.20%	8	0.011	0.006	0.640	0.02	1.890	0.3	2.7
1243.1	1243	699.84	1242	692.62	399.20	1.80%	8	0.011	0.003	0.630	0.02	1.241	0.2	3.3
1244.1	1244	707.02	1243	699.84	285.50	2.50%	8	0.011	0.001	0.520	0.67	1.464	0.0	100.0
1245.1	1245	684.97	577	670.17	293.90	5.00%	8	0.011	0.016	0.870	0.67	2.071	0.8	100.0
1246.1	1246	687.69	1245	684.97	306.40	0.90%	8	0.011	0.008	0.710	0.03	0.870	0.9	4.6
1247.1	1247	693.60	1246	687.69	139.90	4.20%	8	0.011	0.000	0.000	0.00	1.897	0.0	0.0
1248.1	1248	706.00	1249	696.92	314.60	2.90%	8	0.011	0.001	0.530	0.00	1.568	0.1	0.6
1249.1	1249	696.92	1246	687.69	476.10	1.90%	8	0.011	0.004	0.570	0.52	1.285	0.3	78.3
1250.1	1250	703.25	1251	690.27	449.90	2.90%	8	0.011	0.001	0.530	0.67	1.568	0.1	100.0
1251.1	1251	690.27	1245	684.97	435.60	1.20%	8	0.011	0.005	0.600	0.01	1.018	0.4	2.0
1252.1	1252	620.60	LS_SRP1	620.54	26.70	0.20%	27	0.011	0.582	5.770	0.15	11.205	5.2	6.8
1253.1	1253	621.00	1252	620.60	159.20	0.30%	27	0.011	0.584	2.350	0.34	11.859	4.9	15.3
1254.1	1254	630.59	1253	621.00	578.10	1.70%	27	0.011	0.593	4.410	0.66	30.467	1.9	29.4
1255.1	1255	645.21	1254	630.59	705.70	2.10%	27	0.011	0.604	4.880	0.21	34.047	1.8	9.5
1256.1	1256	645.68	1255	645.21	182.60	0.30%	27	0.011	0.608	2.390	0.35	12.001	5.1	15.5
1257.1	1257	649.42	875	647.93	387.30	0.40%	27	0.011	0.559	2.670	0.41	14.671	3.8	18.3
1258.1	1258	688.89	2131	687.77	300.00	0.40%	8	0.011	0.012	0.930	0.07	0.564	2.2	10.8
1259.1	1259	691.09	1258	688.89	300.60	0.70%	8	0.011	0.012	0.870	0.05	0.790	1.6	8.2
1260.1	1260	697.45	1259	691.09	417.30	1.50%	8	0.011	0.000	0.000	0.00	1.140	0.0	0.0
1261.1	1261	701.12	1260	697.45	238.30	1.50%	8	0.011	0.000	0.000	0.00	1.146	0.0	0.0
1262.1	1262	678.74	32	673.90	49.80	9.70%	12	0.011	0.058	1.280	0.07	8.484	0.7	6.6
1263.1	1263	678.98	1262	678.74	34.70	0.70%	12	0.011	0.058	1.570	0.13	2.264	2.6	12.6
1264.1	1264	680.32	1263	678.98	309.00	0.40%	12	0.011	0.058	1.330	0.14	1.792	3.2	14.1
1265.1	1265	680.74	1264	680.32	76.00	0.60%	12	0.011	0.058	1.420	0.13	2.023	2.9	13.5
1266.1	1266	682.44	1265	680.74	411.40	0.40%	12	0.011	0.058	1.280	0.14	1.749	3.3	14.5
1267.1	1267	684.63	2436	683.21	304.50	0.50%	12	0.011	0.050	1.240	0.13	1.858	2.7	13.4
1268.1	1268	686.66	1267	684.63	373.80	0.50%	12	0.011	0.050	1.270	0.28	2.005	2.5	27.6
1269.1	1269	689.15	1268	686.66	345.90	0.70%	12	0.011	0.050	1.420	0.12	2.309	2.2	12.2
1270.1	1270	692.32	1269	689.15	437.60	0.70%	12	0.011	0.051	1.430	0.12	2.316	2.2	12.2
1271.1	1271	694.39	1270	692.32	394.80	0.50%	12	0.011	0.051	1.270	0.28	1.970	2.6	28.1
1272.1	1272	696.58	1271	694.39	297.40	0.70%	12	0.011	0.051	1.450	0.34	2.335	2.2	34.1
1273.1	1273	699.83	1272	696.58	314.50	1.00%	12	0.011	0.051	1.450	0.11	2.766	1.8	11.1
1274.1	1274	701.86	1273	699.83	387.60	0.50%	12	0.011	0.051	1.270	0.28	1.969	2.6	27.8
1275.1	1275	703.79	1274	701.86	365.30	0.50%	12	0.011	0.051	1.280	0.27	1.978	2.6	27.1
1276.1	1276	704.33	1275	703.79	89.10	0.60%	12	0.011	0.051	1.360	0.13	2.119	2.4	12.8
1277.1	1277	706.71	1276	704.33	459.70	0.50%	12	0.011	0.051	1.290	0.26	1.958	2.6	26.5
1280.1	1280	673.62	1281	663.95	370.60	2.60%	8	0.011	0.001	0.530	0.67	1.491	0.1	100.0
1281.1	1281	663.95	1282	653.40	122.40	8.60%	8	0.011	0.006	0.630	0.02	2.710	0.2	2.4

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1282.1	1282	653.40	2192	652.02	467.00	0.30%	18	0.011	0.648	2.670	0.47	4.361	14.9	31.6
1283.1	1283	719.48	LS_BM	712.50	34.70	20.10%	8	0.013	0.001	0.530	0.00	3.500	0.0	0.7
1284.1	1284	721.00	1283	719.48	265.00	0.60%	8	0.013	0.001	0.530	0.16	0.592	0.2	23.5
1285.1	1285	723.71	1284	721.00	521.20	0.50%	8	0.013	0.000	0.000	0.00	0.563	0.0	0.0
1286.1	1286	776.00	1287	773.00	169.90	1.80%	8	0.012	0.001	0.530	0.00	1.124	0.1	0.7
1287.1	1287	773.00	1288	771.00	320.90	0.60%	8	0.012	0.002	0.590	0.01	0.668	0.3	2.1
1288.1	1288	771.00	1289	764.00	392.90	1.80%	8	0.012	0.003	0.610	0.52	1.129	0.3	77.6
1289.1	1289	764.00	1290	758.00	308.40	1.90%	8	0.012	0.012	0.820	0.04	1.180	1.0	6.7
1290.1	1290	758.00	1291	749.00	288.00	3.10%	8	0.012	0.013	0.790	0.67	1.496	0.9	100.0
1291.1	1291	749.00	1292	742.00	462.70	1.50%	8	0.012	0.015	0.870	0.44	1.041	1.5	65.8
1292.1	1292	742.00	1293	734.00	396.60	2.00%	8	0.012	0.017	0.940	0.63	1.202	1.4	94.8
1293.1	1293	734.00	1294	733.03	36.50	2.70%	8	0.012	0.033	1.210	0.09	1.379	2.4	13.6
1294.1	1294	733.03	2174	728.00	291.80	1.70%	8	0.012	0.034	1.280	0.61	1.111	3.1	91.0
1295.1	1295	718.18	1296	716.68	289.40	0.50%	8	0.012	0.050	1.250	0.30	0.609	8.2	45.7
1296.1	1296	716.68	1297	715.23	288.80	0.50%	8	0.012	0.055	1.300	0.31	0.600	9.2	46.1
1297.1	1297	715.23	1298	713.02	256.30	0.90%	8	0.012	0.058	1.610	0.37	0.786	7.4	54.8
1298.1	1298	713.02	348	710.86	452.60	0.50%	8	0.015	0.084	1.320	0.34	0.468	18.0	50.6
1299.1	1299	735.00	1294	733.03	131.00	1.50%	8	0.012	0.000	0.450	0.00	1.038	0.0	0.5
1300.1	1300	780.00	1301	776.00	137.40	2.90%	8	0.012	0.001	0.530	0.00	1.444	0.1	0.7
1301.1	1301	776.00	1302	772.00	446.10	0.90%	8	0.012	0.002	0.560	0.01	0.801	0.3	1.3
1302.1	1302	772.00	2172	769.00	274.70	1.10%	8	0.012	0.005	0.630	0.32	0.884	0.6	47.7
1303.1	1303	775.00	1288	771.00	230.30	1.70%	8	0.012	0.000	0.300	0.00	1.115	0.0	0.4
1304.1	1304	740.00	1305	732.00	297.40	2.70%	8	0.012	0.001	0.530	0.67	1.388	0.1	100.0
1305.1	1305	732.00	2174	728.00	301.90	1.30%	8	0.012	0.002	0.550	0.01	0.974	0.2	0.8
1306.1	1306	739.33	1308	728.00	500.20	2.30%	8	0.012	0.001	0.530	0.00	1.273	0.1	0.7
1307.1	1307	740.73	1306	739.33	57.80	2.40%	8	0.012	0.000	0.300	0.00	1.317	0.0	0.4
1308.1	1308	728.00	1296	716.68	325.00	3.50%	8	0.012	0.003	0.550	0.01	1.579	0.2	0.9
1309.1	1309	742.00	1310	733.78	432.10	1.90%	8	0.012	0.000	0.300	0.00	1.167	0.0	0.4
1310.1	1310	733.78	1311	721.86	270.50	4.40%	8	0.012	0.003	0.570	0.67	1.776	0.2	100.0
1311.1	1311	721.86	1314	720.49	253.50	0.50%	8	0.012	0.007	0.760	0.18	0.622	1.1	26.7
1312.1	1312	727.95	1311	721.86	290.20	2.10%	8	0.012	0.002	0.540	0.61	1.226	0.2	92.2
1313.1	1313	729.44	1312	727.95	278.20	0.50%	8	0.012	0.001	0.530	0.15	0.619	0.1	23.0
1314.1	1314	720.49	1295	718.18	370.20	0.60%	8	0.012	0.008	0.760	0.20	0.668	1.2	30.7
1315.1	1315	719.77	1297	715.23	282.40	1.60%	8	0.012	0.000	0.450	0.46	1.073	0.0	68.6
1316.1	1316	738.58	1317	738.00	15.90	3.70%	8	0.012	0.004	0.600	0.01	1.618	0.3	2.0
1317.1	1317	738.00	1293	734.00	289.70	1.40%	8	0.012	0.014	0.850	0.45	0.994	1.4	67.3
1318.1	1318	744.00	1317	738.00	275.50	2.20%	8	0.012	0.009	0.740	0.63	1.249	0.7	95.0
1319.1	1319	754.00	1318	744.00	288.80	3.50%	8	0.012	0.005	0.650	0.67	1.574	0.3	100.0
1320.1	1320	754.50	1319	754.00	288.10	0.20%	8	0.012	0.003	0.690	0.08	0.352	0.9	12.4
1321.1	1321	766.50	1320	754.50	412.40	2.90%	8	0.012	0.001	0.530	0.00	1.443	0.1	0.7

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1322.1	1322	767.38	1321	766.50	130.40	0.70%	8	0.012	0.001	0.520	0.00	0.695	0.1	0.5
1323.1	1323	765.10	1330	757.10	487.30	1.60%	8	0.012	0.000	0.250	0.45	1.084	0.0	67.1
1324.1	1324	760.06	1325	746.76	331.50	4.00%	8	0.012	0.000	0.450	0.00	1.695	0.0	0.5
1325.1	1325	746.76	1318	744.00	271.10	1.00%	8	0.012	0.002	0.540	0.28	0.854	0.3	42.2
1326.1	1326	755.35	1327	747.52	277.60	2.80%	8	0.012	0.000	0.450	0.67	1.421	0.0	100.0
1327.1	1327	747.52	1316	738.58	323.10	2.80%	8	0.012	0.002	0.580	0.01	1.407	0.1	1.9
1328.1	1328	748.50	1329	745.00	420.20	0.80%	8	0.012	0.001	0.520	0.00	0.772	0.1	0.6
1329.1	1329	745.00	1979	743.30	320.10	0.50%	8	0.012	0.003	0.610	0.02	0.617	0.4	2.7
1330.1	1330	757.10	1329	745.00	199.40	6.10%	8	0.012	0.001	0.530	0.00	2.084	0.0	0.6
1331.1	1331	706.40	2019	705.40	17.40	5.80%	8	0.011	0.015	0.820	0.04	2.216	0.7	6.0
1332.1	1332	707.50	1331	706.40	66.80	1.60%	8	0.011	0.015	0.900	0.06	1.184	1.3	8.4
1333.1	1333	714.00	2023	712.65	132.80	1.00%	8	0.011	0.015	0.880	0.05	0.931	1.6	7.8
1334.1	1334	715.81	1333	714.00	334.90	0.50%	8	0.011	0.010	0.800	0.04	0.679	1.4	6.7
1335.1	1335	717.14	1334	715.81	242.10	0.50%	8	0.011	0.007	0.750	0.04	0.684	1.0	5.8
1336.1	1336	726.74	1345	725.14	296.70	0.50%	12	0.011	0.018	0.960	0.22	1.998	0.9	22.4
1337.1	1337	710.92	1277	706.71	218.00	1.90%	12	0.011	0.038	1.240	0.09	3.782	1.0	8.8
1338.1	1338	712.72	1337	710.92	342.00	0.50%	12	0.011	0.039	1.140	0.12	1.974	2.0	11.8
1339.1	1339	714.17	1338	712.72	275.20	0.50%	12	0.011	0.039	1.140	0.26	1.975	2.0	26.3
1340.1	1340	715.57	1339	714.17	254.00	0.60%	12	0.011	0.038	1.160	0.26	2.020	1.9	25.6
1341.1	1341	716.89	1340	715.57	249.60	0.50%	12	0.011	0.038	1.130	0.25	1.979	1.9	25.0
1342.1	1342	718.29	1341	716.89	264.70	0.50%	12	0.011	0.038	1.140	0.26	1.979	1.9	25.8
1343.1	1343	719.27	1342	718.29	177.00	0.60%	12	0.011	0.026	0.860	0.11	2.025	1.3	10.8
1344.1	1344	720.04	1343	719.27	128.80	0.60%	12	0.011	0.026	0.940	0.10	2.104	1.2	10.2
1345.1	1345	725.14	1344	720.04	304.40	1.70%	12	0.011	0.018	0.940	0.06	3.522	0.5	6.0
1346.1	1346	791.98	1347	790.69	215.40	0.60%	8	0.011	0.000	0.250	0.00	0.714	0.0	0.4
1347.1	1347	790.69	1348	789.51	217.20	0.50%	8	0.011	0.001	0.520	0.00	0.680	0.1	0.6
1348.1	1348	789.51	1349	788.81	143.40	0.50%	8	0.011	0.001	0.530	0.00	0.645	0.2	0.7
1349.1	1349	788.81	1350	781.17	235.80	3.20%	8	0.011	0.001	0.530	0.00	1.661	0.1	0.7
1350.1	1350	781.17	1351	775.86	235.90	2.30%	8	0.011	0.002	0.540	0.01	1.385	0.1	0.8
1351.1	1351	775.86	1371	773.23	181.50	1.40%	8	0.011	0.003	0.570	0.01	1.111	0.3	1.3
1352.1	1352	778.64	1351	775.86	52.00	5.40%	8	0.011	0.001	0.520	0.00	2.135	0.0	0.6
1353.1	1353	780.07	1352	778.64	262.00	0.50%	8	0.011	0.001	0.520	0.15	0.682	0.1	22.0
1354.1	1354	785.62	1353	780.07	172.50	3.20%	8	0.011	0.001	0.520	0.00	1.656	0.0	0.5
1355.1	1355	791.04	1354	785.62	179.00	3.00%	8	0.011	0.000	0.120	0.00	1.606	0.0	0.3
1356.1	1356	796.15	1357	789.33	260.30	2.60%	8	0.011	0.000	0.490	0.67	1.494	0.0	100.0
1357.1	1357	789.33	1358	786.52	205.00	1.40%	8	0.011	0.001	0.530	0.00	1.081	0.1	0.7
1358.1	1358	786.52	1359	781.88	252.80	1.80%	8	0.011	0.002	0.540	0.47	1.250	0.1	70.3
1359.1	1359	781.88	1360	776.24	237.40	2.40%	8	0.011	0.002	0.550	0.01	1.423	0.1	0.9
1360.1	1360	776.24	1361	766.46	266.40	3.70%	8	0.011	0.003	0.570	0.67	1.768	0.2	100.0
1361.1	1361	766.46	1369	763.33	297.50	1.10%	8	0.011	0.007	0.670	0.34	0.947	0.7	50.5

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1362.1	1362	768.00	1361	766.46	308.00	0.50%	8	0.011	0.003	0.610	0.02	0.653	0.5	2.5
1363.1	1363	780.08	1364	778.47	99.30	1.60%	8	0.011	0.001	0.520	0.00	1.175	0.0	0.5
1364.1	1364	778.47	1366	774.42	170.60	2.40%	8	0.011	0.001	0.530	0.00	1.422	0.1	0.7
1365.1	1365	784.75	1364	778.47	227.70	2.80%	8	0.011	0.000	0.120	0.00	1.533	0.0	0.3
1366.1	1366	774.42	1367	773.49	166.50	0.60%	8	0.011	0.001	0.530	0.00	0.690	0.2	0.7
1367.1	1367	773.49	1411	769.02	181.40	2.50%	8	0.011	0.002	0.550	0.01	1.449	0.1	0.9
1368.1	1368	765.00	1413	763.75	233.00	0.50%	8	0.011	0.000	0.000	0.00	0.676	0.0	0.0
1369.1	1369	763.33	1407	761.71	304.10	0.50%	8	0.011	0.014	0.920	0.06	0.674	2.0	9.5
1370.1	1370	772.23	1369	763.33	266.20	3.30%	8	0.011	0.005	0.640	0.67	1.688	0.3	100.0
1371.1	1371	773.23	1370	772.23	179.10	0.60%	8	0.011	0.005	0.670	0.03	0.690	0.7	3.8
1372.1	1372	782.36	1371	773.23	244.30	3.70%	8	0.011	0.001	0.530	0.00	1.785	0.1	0.7
1373.1	1373	788.70	1374	785.30	143.00	2.40%	8	0.011	0.000	0.120	0.00	1.423	0.0	0.3
1374.1	1374	785.30	1376	783.75	290.70	0.50%	8	0.011	0.000	0.490	0.16	0.674	0.1	23.7
1375.1	1375	786.87	1382	776.68	252.60	4.00%	8	0.011	0.000	0.000	0.67	1.854	0.0	100.0
1376.1	1376	783.75	1372	782.36	257.50	0.50%	8	0.011	0.001	0.530	0.14	0.678	0.1	21.5
1377.1	1377	785.38	1378	774.92	121.20	8.60%	8	0.011	0.001	0.520	0.00	2.711	0.0	0.5
1378.1	1378	774.92	1392	767.35	272.70	2.80%	8	0.011	0.002	0.540	0.67	1.538	0.1	100.0
1379.1	1379	775.49	1378	774.92	94.70	0.60%	8	0.011	0.001	0.520	0.00	0.716	0.1	0.6
1380.1	1380	778.15	1379	775.49	154.30	1.70%	8	0.011	0.001	0.520	0.00	1.212	0.0	0.5
1381.1	1381	778.93	1380	778.15	159.40	0.50%	8	0.011	0.000	0.120	0.00	0.646	0.0	0.3
1382.1	1382	776.68	1383	774.41	250.70	0.90%	8	0.011	0.000	0.520	0.23	0.878	0.0	34.6
1383.1	1383	774.41	1384	770.78	254.10	1.40%	8	0.011	0.001	0.530	0.37	1.103	0.1	55.1
1384.1	1384	770.78	1385	768.63	155.50	1.40%	8	0.011	0.002	0.540	0.01	1.085	0.2	0.8
1385.1	1385	768.63	1386	765.76	199.30	1.40%	8	0.011	0.002	0.540	0.01	1.108	0.2	0.8
1386.1	1386	765.76	1387	764.10	113.80	1.50%	8	0.011	0.003	0.550	0.01	1.115	0.2	0.9
1387.1	1387	764.10	1390	761.59	181.30	1.40%	8	0.011	0.004	0.580	0.01	1.086	0.4	1.6
1388.1	1388	768.89	1387	764.10	248.70	1.90%	8	0.011	0.001	0.520	0.48	1.281	0.1	72.4
1389.1	1389	759.19	1391	758.87	44.60	0.70%	8	0.011	0.005	0.640	0.02	0.782	0.6	3.2
1390.1	1390	761.59	1389	759.19	176.80	1.40%	8	0.011	0.004	0.590	0.01	1.075	0.4	1.8
1391.1	1391	758.87	1410	757.81	191.10	0.60%	8	0.011	0.008	0.760	0.04	0.687	1.1	6.0
1392.1	1392	767.35	1391	758.87	221.00	3.80%	8	0.011	0.002	0.550	0.01	1.808	0.1	1.1
1393.1	1393	777.31	1397	767.47	190.20	5.20%	8	0.011	0.000	0.490	0.00	2.099	0.0	0.5
1394.1	1394	769.74	1396	767.29	164.20	1.50%	8	0.011	0.000	0.250	0.00	1.128	0.0	0.4
1395.1	1395	769.59	1396	767.29	137.80	1.70%	8	0.011	0.001	0.520	0.00	1.193	0.0	0.5
1396.1	1396	767.29	1407	761.71	266.20	2.10%	8	0.011	0.001	0.530	0.56	1.336	0.1	84.4
1397.1	1397	767.47	1398	766.44	180.80	0.60%	8	0.011	0.001	0.530	0.00	0.697	0.1	0.6
1398.1	1398	766.44	1399	756.75	148.00	6.50%	8	0.011	0.001	0.530	0.00	2.361	0.0	0.7
1399.1	1399	756.75	1400	755.93	145.30	0.60%	8	0.011	0.009	0.820	0.05	0.693	1.3	7.4
1400.1	1400	755.93	1403	754.12	342.60	0.50%	8	0.011	0.010	0.800	0.05	0.671	1.4	6.8
1401.1	1401	765.45	1402	761.51	160.40	2.50%	8	0.011	0.000	0.370	0.00	1.447	0.0	0.4

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1402.1	1402	761.51	1403	754.12	192.20	3.80%	8	0.011	0.001	0.530	0.00	1.810	0.1	0.7
1403.1	1403	754.12	1405	753.10	187.80	0.50%	8	0.011	0.011	0.860	0.06	0.680	1.6	8.3
1404.1	1404	752.09	1093	748.00	232.60	1.80%	8	0.011	0.030	1.200	0.09	1.224	2.5	13.9
1405.1	1405	753.10	1404	752.09	178.40	0.60%	8	0.011	0.012	0.910	0.06	0.694	1.7	9.6
1406.1	1406	754.26	1404	752.09	243.20	0.90%	8	0.011	0.017	0.940	0.06	0.872	2.0	9.2
1407.1	1407	761.71	1408	760.67	119.10	0.90%	8	0.011	0.016	0.910	0.06	0.863	1.8	8.7
1408.1	1408	760.67	1409	755.44	231.70	2.30%	8	0.011	0.016	0.900	0.06	1.387	1.2	8.4
1409.1	1409	755.44	1406	754.26	215.40	0.50%	8	0.011	0.017	1.030	0.08	0.683	2.4	12.3
1410.1	1410	757.81	1399	756.75	190.30	0.60%	8	0.011	0.008	0.760	0.04	0.689	1.1	6.0
1411.1	1411	769.02	1362	768.00	181.80	0.60%	8	0.011	0.002	0.620	0.02	0.691	0.3	3.0
1412.1	1412	787.70	1374	785.30	152.30	1.60%	8	0.011	0.000	0.000	0.00	1.159	0.0	0.0
1413.1	1413	763.75	1369	763.33	65.40	0.60%	8	0.011	0.001	0.520	0.00	0.740	0.1	0.5
1414.1	1414	667.39	1415	665.64	357.30	0.50%	8	0.011	0.055	1.370	0.28	0.646	8.5	42.2
1415.1	1415	665.64	1416	664.42	371.60	0.30%	10	0.011	0.055	1.160	0.25	0.959	5.8	29.7
1416.1	1416	664.42	1417	661.40	420.60	0.70%	10	0.011	0.057	1.570	0.13	1.418	4.1	16.1
1417.1	1417	661.40	1418	660.15	500.00	0.20%	10	0.011	0.060	1.100	0.18	0.837	7.2	21.2
1418.1	1418	660.15	1419	655.48	282.10	1.70%	10	0.011	0.064	1.570	0.58	2.153	3.0	69.8
1419.1	1419	655.48	1420	652.06	146.20	2.30%	10	0.011	0.066	1.540	0.11	2.559	2.6	12.7
1420.1	1420	652.06	1838	648.77	343.00	1.00%	10	0.011	0.157	2.650	0.19	1.639	9.6	22.4
1421.1	1421	656.57	1841	645.43	310.50	3.60%	8	0.011	0.014	0.760	0.03	1.748	0.8	4.6
1422.1	1422	644.14	LS_RBSS	644.00	4.10	3.40%	12	0.011	0.281	3.520	0.17	4.999	5.6	16.8
1423.1	1423	687.80	378	685.91	466.10	0.40%	8	0.013	0.005	0.660	0.13	0.497	1.0	19.3
1424.1	1424	689.57	1423	687.80	416.20	0.40%	8	0.013	0.000	0.000	0.00	0.509	0.0	0.0
1425.1	1425	693.84	1424	689.57	347.30	1.20%	8	0.013	0.000	0.000	0.00	0.866	0.0	0.0
1426.1	1426	695.49	1425	693.84	230.70	0.70%	8	0.013	0.000	0.000	0.00	0.660	0.0	0.0
1427.1	1427	750.03	1428	745.84	408.80	1.00%	6	0.013	0.001	0.530	0.00	0.367	0.3	0.9
1428.1	1428	745.84	316	742.47	324.10	1.00%	6	0.013	0.003	0.650	0.02	0.370	0.9	4.9
1429.1	1429	752.11	1427	750.03	198.10	1.10%	6	0.013	0.001	0.530	0.00	0.372	0.2	0.8
1430.1	1430	635.30	2274	632.80	402.70	0.60%	18	0.011	0.916	4.780	0.34	6.322	14.5	22.4
1431.1	1431	605.90	1433	599.00	327.30	2.10%	8	0.011	0.017	0.920	0.06	1.340	1.3	8.5
1432.1	1432	619.00	1431	605.90	419.50	3.10%	8	0.011	0.003	0.560	0.01	1.631	0.2	1.1
1433.1	1433	599.00	LS_BCP4	592.92	65.10	9.30%	8	0.011	0.027	0.200	0.39	2.820	1.0	58.7
1434.1	1434	613.40	1433	599.00	358.60	4.00%	8	0.011	0.006	0.630	0.67	1.850	0.3	100.0
1435.1	1435	616.90	1434	613.40	344.70	1.00%	8	0.011	0.003	0.560	0.01	0.930	0.3	1.0
1436.1	1436	619.54	1435	616.90	348.70	0.80%	8	0.011	0.000	0.000	0.19	0.803	0.0	28.3
1437.1	1437	621.39	1438	617.01	228.40	1.90%	8	0.011	0.000	0.000	0.00	1.278	0.0	0.0
1438.1	1438	617.01	1439	615.50	416.10	0.40%	10	0.011	0.002	0.540	0.01	1.008	0.2	0.6
1439.1	1439	615.50	1440	614.05	441.90	0.30%	10	0.011	0.005	0.620	0.02	0.959	0.5	1.8
1440.1	1440	614.05	1441	612.60	455.60	0.30%	10	0.011	0.011	0.830	0.13	0.944	1.1	15.5
1441.1	1441	612.60	1442	611.15	442.50	0.30%	10	0.011	0.020	1.060	0.09	0.958	2.1	10.2

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1442.1	1442	611.15	1443	609.70	454.00	0.30%	10	0.011	0.031	0.870	0.21	0.946	3.3	25.4
1443.1	1443	609.70	1444	607.18	93.20	2.70%	10	0.011	0.042	1.280	0.09	2.751	1.5	10.9
1444.1	1444	607.18	1998	604.58	294.40	0.90%	10	0.011	0.046	1.450	0.38	1.573	2.9	45.4
1445.1	1445	737.00	1446	731.60	484.00	1.10%	8	0.011	0.001	0.530	0.30	0.975	0.1	45.6
1446.1	1446	731.60	1447	727.50	192.80	2.10%	8	0.011	0.003	0.570	0.01	1.346	0.2	1.6
1447.1	1447	727.50	1448	714.20	295.10	4.50%	8	0.011	0.004	0.590	0.67	1.960	0.2	100.0
1448.1	1448	714.20	1449	713.10	136.50	0.80%	8	0.011	0.008	0.710	0.03	0.829	0.9	4.5
1449.1	1449	713.10	1450	711.90	160.80	0.70%	8	0.011	0.008	0.720	0.03	0.797	1.0	4.9
1450.1	1450	711.90	1451	711.00	127.30	0.70%	8	0.011	0.009	0.750	0.04	0.776	1.1	5.5
1451.1	1451	711.00	1452	708.00	392.80	0.80%	8	0.011	0.010	0.770	0.25	0.807	1.2	37.9
1452.1	1452	708.00	1453	706.00	253.30	0.80%	8	0.011	0.011	0.830	0.25	0.820	1.4	37.2
1453.1	1453	706.00	1454	705.13	133.30	0.70%	8	0.011	0.012	0.860	0.05	0.746	1.6	7.9
1454.1	1454	705.13	1455	701.70	455.00	0.80%	8	0.011	0.013	0.880	0.25	0.801	1.6	37.0
1455.1	1455	701.70	1456	700.60	142.90	0.80%	8	0.011	0.016	0.950	0.06	0.810	2.0	9.6
1456.1	1456	700.60	1457	699.90	105.40	0.70%	8	0.011	0.017	0.990	0.07	0.752	2.3	10.7
1457.1	1457	699.90	1458	697.60	299.50	0.80%	8	0.011	0.018	1.010	0.07	0.809	2.2	11.2
1458.1	1458	697.60	1459	695.40	299.50	0.70%	8	0.011	0.019	1.050	0.08	0.791	2.4	12.1
1459.1	1459	695.40	1460	694.20	159.00	0.80%	8	0.011	0.024	1.140	0.09	0.802	3.0	13.6
1460.1	1460	694.20	1461	691.20	132.40	2.30%	8	0.011	0.025	1.070	0.08	1.389	1.8	11.4
1461.1	1461	691.20	1462	688.90	300.70	0.80%	8	0.011	0.027	1.160	0.11	0.807	3.3	16.0
1462.1	1462	688.90	1463	684.90	301.80	1.30%	8	0.011	0.030	1.210	0.10	1.063	2.8	14.3
1463.1	1463	684.90	1464	673.00	316.30	3.80%	8	0.011	0.033	1.160	0.08	1.790	1.9	12.1
1464.1	1464	673.00	1465	672.15	173.10	0.50%	8	0.011	0.041	1.160	0.14	0.647	6.3	21.2
1465.1	1465	672.15	1836	662.52	509.30	1.90%	8	0.011	0.075	1.710	0.13	1.269	5.9	18.9
1466.1	1466	711.20	1467	701.80	253.30	3.70%	8	0.011	0.000	0.000	0.67	1.778	0.0	100.0
1467.1	1467	701.80	1461	691.20	190.60	5.60%	8	0.011	0.001	0.530	0.00	2.177	0.1	0.7
1468.1	1468	708.30	1459	695.40	315.00	4.10%	8	0.011	0.002	0.560	0.01	1.868	0.1	1.3
1469.1	1469	716.20	1468	708.30	293.40	2.70%	8	0.011	0.001	0.530	0.67	1.515	0.1	100.0
1470.1	1470	728.79	1471	706.39	492.90	4.50%	8	0.011	0.000	0.000	0.67	1.968	0.0	100.0
1471.1	1471	706.39	1472	701.78	109.00	4.20%	8	0.011	0.003	0.560	0.01	1.898	0.1	1.3
1472.1	1472	701.78	1473	699.11	89.00	3.00%	8	0.011	0.029	1.120	0.08	1.599	1.8	11.9
1473.1	1473	699.11	1474	696.73	120.00	2.00%	8	0.011	0.029	1.180	0.09	1.300	2.3	13.5
1474.1	1474	696.73	1475	692.61	300.30	1.40%	8	0.011	0.034	1.280	0.10	1.081	3.1	15.6
1475.1	1475	692.61	1476	690.69	303.00	0.60%	8	0.011	0.037	1.210	0.13	0.735	5.1	19.4
1476.1	1476	690.69	1477	684.68	300.00	2.00%	8	0.011	0.042	1.330	0.10	1.306	3.2	15.3
1477.1	1477	684.68	1478	678.51	305.30	2.00%	8	0.011	0.046	1.380	0.11	1.312	3.5	15.8
1478.1	1478	678.51	1479	669.75	301.60	2.90%	8	0.011	0.050	1.380	0.10	1.573	3.2	14.8
1479.1	1479	669.75	1414	667.39	132.70	1.80%	8	0.011	0.055	1.480	0.11	1.231	4.4	16.8
1480.1	1480	712.60	1475	692.61	500.00	4.00%	8	0.011	0.001	0.530	0.00	1.846	0.0	0.6
1481.1	1481	715.26	1448	714.20	145.50	0.70%	8	0.011	0.003	0.660	0.03	0.788	0.4	4.1

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1482.1	1482	718.71	1481	715.26	459.60	0.80%	8	0.011	0.001	0.530	0.20	0.800	0.1	29.4
1483.1	1483	712.64	1474	696.73	500.00	3.20%	8	0.011	0.002	0.540	0.01	1.647	0.1	0.8
1484.1	1484	672.41	1465	672.15	168.60	0.20%	8	0.011	0.034	0.710	0.18	0.362	9.5	26.8
1485.1	1485	680.17	1484	672.41	301.10	2.60%	8	0.011	0.023	1.030	0.07	1.482	1.6	10.5
1486.1	1486	684.24	1485	680.17	301.10	1.40%	8	0.011	0.019	0.960	0.06	1.073	1.8	9.2
1487.1	1487	688.07	1486	684.24	133.90	2.90%	8	0.011	0.014	0.860	0.05	1.561	0.9	7.4
1488.1	1488	691.60	1487	688.07	168.50	2.10%	8	0.011	0.014	0.860	0.05	1.336	1.0	7.7
1489.1	1489	693.20	1488	691.60	34.80	4.60%	8	0.011	0.010	0.720	0.03	1.979	0.5	4.3
1490.1	1490	698.22	1489	693.20	314.60	1.60%	8	0.011	0.009	0.720	0.03	1.166	0.7	4.7
1491.1	1491	705.75	1490	698.22	271.20	2.80%	8	0.011	0.004	0.630	0.67	1.538	0.3	100.0
1492.1	1492	713.01	1491	705.75	259.20	2.80%	8	0.011	0.003	0.590	0.67	1.545	0.2	100.0
1493.1	1493	716.12	1492	713.01	119.40	2.60%	8	0.011	0.002	0.550	0.01	1.489	0.2	1.0
1494.1	1494	717.57	1493	716.12	113.90	1.30%	8	0.011	0.002	0.540	0.01	1.041	0.2	0.8
1495.1	1495	721.26	1494	717.57	166.30	2.20%	8	0.011	0.000	0.000	0.00	1.375	0.0	0.0
1496.1	1496	723.03	1495	721.26	74.90	2.40%	8	0.011	0.000	0.000	0.00	1.419	0.0	0.0
1497.1	1497	718.45	1498	709.01	451.70	2.10%	8	0.011	0.000	0.000	0.52	1.334	0.0	78.7
1498.1	1498	709.01	1499	695.25	328.30	4.20%	8	0.011	0.001	0.530	0.00	1.890	0.1	0.7
1499.1	1499	695.25	1501	686.58	311.50	2.80%	8	0.011	0.003	0.580	0.01	1.540	0.2	1.7
1500.1	1500	695.91	1499	695.25	91.80	0.70%	8	0.011	0.000	0.000	0.00	0.783	0.0	0.0
1501.1	1501	686.58	1502	674.17	323.70	3.80%	8	0.011	0.004	0.600	0.01	1.807	0.2	2.2
1502.1	1502	674.17	1484	672.41	331.30	0.50%	8	0.011	0.006	0.590	0.01	0.673	0.9	1.1
1503.1	1503	725.60	1504	716.27	312.40	3.00%	8	0.011	0.000	0.000	0.00	1.595	0.0	0.0
1504.1	1504	716.27	1505	703.40	294.80	4.40%	8	0.011	0.002	0.540	0.67	1.929	0.1	100.0
1505.1	1505	703.40	1490	698.22	111.50	4.60%	8	0.011	0.002	0.540	0.01	1.989	0.1	0.8
1506.1	1506	716.48	1507	703.54	379.10	3.40%	8	0.011	0.000	0.500	0.67	1.705	0.0	100.0
1507.1	1507	703.54	1488	691.60	376.90	3.20%	8	0.011	0.002	0.550	0.67	1.643	0.1	100.0
1508.1	1508	721.69	1509	720.98	106.20	0.70%	8	0.011	0.000	0.000	0.00	0.755	0.0	0.0
1509.1	1509	720.98	1510	695.00	464.40	5.60%	8	0.011	0.001	0.520	0.67	2.183	0.0	100.0
1510.1	1510	695.00	1486	684.24	379.90	2.80%	8	0.011	0.003	0.560	0.67	1.553	0.2	100.0
1511.1	1511	715.60	1512	691.00	347.20	7.10%	8	0.011	0.000	0.000	0.00	2.457	0.0	0.0
1512.1	1512	691.00	1485	680.17	343.70	3.20%	8	0.011	0.002	0.540	0.01	1.639	0.1	0.8
1513.1	1513	692.32	1484	672.41	362.00	5.50%	8	0.011	0.001	0.530	0.67	2.165	0.1	100.0
1514.1	1514	703.93	1513	692.32	254.70	4.60%	8	0.011	0.000	0.000	0.67	1.971	0.0	100.0
1515.1	1515	695.12	1476	690.69	219.00	2.00%	8	0.011	0.003	0.570	0.01	1.313	0.2	1.5
1516.1	1516	707.01	1515	695.12	500.60	2.40%	8	0.011	0.000	0.000	0.00	1.422	0.0	0.0
1517.1	1517	696.70	1518	690.56	400.50	1.50%	8	0.011	0.000	0.340	0.00	1.143	0.0	0.4
1518.1	1518	690.56	1477	684.68	299.00	2.00%	8	0.011	0.002	0.580	0.01	1.294	0.2	2.1
1519.1	1519	688.89	1520	684.51	339.10	1.30%	8	0.011	0.000	0.000	0.00	1.049	0.0	0.0
1520.1	1520	684.51	1478	678.51	341.00	1.80%	8	0.011	0.002	0.540	0.01	1.224	0.1	0.8
1521.1	1521	673.93	1479	669.75	299.70	1.40%	8	0.011	0.002	0.540	0.01	1.090	0.2	0.8

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1522.1	1522	677.55	1521	673.93	400.00	0.90%	8	0.011	0.000	0.000	0.00	0.878	0.0	0.0
1523.1	1523	705.26	1527	699.54	141.70	4.00%	8	0.011	0.000	0.340	0.00	1.855	0.0	0.4
1524.1	1524	690.38	1462	688.90	58.20	2.50%	8	0.011	0.001	0.530	0.00	1.471	0.1	0.6
1525.1	1525	696.17	1526	693.25	133.60	2.20%	8	0.011	0.000	0.340	0.00	1.365	0.0	0.4
1526.1	1526	693.25	1528	685.45	360.90	2.20%	8	0.011	0.001	0.530	0.56	1.357	0.1	84.2
1527.1	1527	699.54	1524	690.38	206.80	4.40%	8	0.011	0.001	0.530	0.00	1.943	0.0	0.6
1528.1	1528	685.45	1463	684.90	49.40	1.10%	8	0.011	0.001	0.530	0.00	0.974	0.1	0.6
1529.1	1529	689.47	1530	684.41	347.20	1.50%	8	0.011	0.002	0.540	0.01	1.114	0.2	0.8
1530.1	1530	684.41	1531	675.89	141.70	6.00%	8	0.011	0.002	0.540	0.01	2.264	0.1	0.8
1531.1	1531	675.89	1532	675.32	73.40	0.80%	8	0.011	0.002	0.560	0.01	0.813	0.3	1.2
1532.1	1532	675.32	1464	673.00	272.00	0.90%	8	0.011	0.005	0.650	0.25	0.852	0.6	38.0
1533.1	1533	677.50	1534	675.82	279.50	0.60%	8	0.011	0.001	0.530	0.17	0.716	0.2	25.9
1534.1	1534	675.82	1532	675.32	116.80	0.40%	8	0.011	0.003	0.610	0.02	0.604	0.5	2.6
1535.1	1535	679.12	1533	677.50	283.80	0.60%	8	0.011	0.000	0.000	0.16	0.697	0.0	24.3
1536.1	1536	717.15	2203	716.12	259.20	0.40%	8	0.011	0.007	0.760	0.14	0.582	1.1	21.6
1537.1	1537	720.11	1536	717.15	158.10	1.90%	8	0.011	0.004	0.670	0.03	1.263	0.3	4.0
1538.1	1538	712.50	2202	710.71	364.00	0.50%	8	0.011	0.010	0.840	0.18	0.647	1.6	26.9
1539.1	1539	708.62	1540	707.66	175.80	0.50%	8	0.011	0.010	0.840	0.05	0.682	1.5	7.8
1540.1	1540	707.66	1541	703.21	289.40	1.50%	8	0.011	0.030	1.220	0.54	1.145	2.6	81.5
1541.1	1541	703.21	1542	701.47	329.20	0.50%	8	0.011	0.029	1.010	0.12	0.671	4.4	18.6
1542.1	1542	701.47	1543	699.93	243.80	0.60%	8	0.011	0.029	1.120	0.11	0.734	3.9	17.1
1543.1	1543	699.93	2201	697.76	414.30	0.50%	12	0.011	0.029	0.930	0.11	1.969	1.4	11.1
1544.1	1544	693.43	1545	691.75	348.10	0.50%	12	0.011	0.122	1.850	0.31	1.891	6.4	30.7
1545.1	1545	691.75	1564	690.15	254.30	0.60%	12	0.011	0.121	2.020	0.34	2.159	5.6	33.5
1546.1	1546	721.94	1547	716.93	266.90	1.90%	8	0.011	0.003	0.560	0.51	1.265	0.3	76.2
1547.1	1547	716.93	1548	716.26	115.50	0.60%	8	0.011	0.006	0.700	0.03	0.703	0.9	4.4
1548.1	1548	716.26	1551	714.94	243.50	0.50%	8	0.011	0.012	0.870	0.06	0.680	1.7	8.4
1549.1	1549	711.77	1552	710.82	172.20	0.60%	8	0.011	0.043	1.250	0.14	0.686	6.3	21.0
1550.1	1550	712.77	1549	711.77	178.70	0.60%	8	0.011	0.029	1.000	0.12	0.691	4.2	18.7
1551.1	1551	714.94	1550	712.77	414.10	0.50%	8	0.011	0.013	0.930	0.06	0.668	2.0	9.7
1552.1	1552	710.82	1554	709.17	309.00	0.50%	8	0.011	0.048	1.340	0.14	0.674	7.1	21.5
1553.1	1553	707.77	1555	702.32	345.80	1.60%	8	0.011	0.059	1.560	0.12	1.159	5.1	18.0
1554.1	1554	709.17	1553	707.77	259.40	0.50%	8	0.011	0.054	1.440	0.29	0.678	8.0	43.3
1555.1	1555	702.32	1544	693.43	68.00	13.10%	8	0.011	0.068	1.400	0.08	3.338	2.0	11.4
1556.1	1556	712.98	1557	710.85	270.00	0.80%	8	0.011	0.000	0.000	0.21	0.820	0.0	32.0
1557.1	1557	710.85	1558	708.40	314.30	0.80%	8	0.011	0.000	0.000	0.00	0.815	0.0	0.0
1558.1	1558	708.40	1541	703.21	115.80	4.50%	8	0.011	0.000	0.000	0.00	1.954	0.0	0.0
1559.1	1559	678.43	2071	677.90	47.50	1.10%	21	0.011	0.535	3.950	0.25	12.788	4.2	14.2
1560.1	1560	680.92	1559	678.43	147.50	1.70%	12	0.011	0.118	2.090	0.14	3.536	3.3	13.5
1561.1	1561	684.43	1560	680.92	170.40	2.10%	12	0.011	0.119	2.060	0.13	3.905	3.0	12.9

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1562.1	1562	687.10	1561	684.43	256.90	1.00%	12	0.011	0.119	2.190	0.42	2.774	4.3	42.2
1563.1	1563	689.05	1562	687.10	247.10	0.80%	12	0.011	0.119	2.220	0.16	2.417	4.9	16.3
1564.1	1564	690.15	1563	689.05	245.60	0.40%	12	0.011	0.120	1.790	0.19	1.821	6.6	19.0
1565.1	1565	777.12	1566	775.77	311.60	0.40%	8	0.012	0.001	0.530	0.00	0.557	0.1	0.6
1566.1	1566	775.77	1582	770.22	168.40	3.30%	8	0.012	0.003	0.570	0.01	1.536	0.2	1.4
1567.1	1567	777.12	1568	771.69	432.40	1.30%	8	0.012	0.001	0.520	0.00	0.948	0.1	0.6
1568.1	1568	771.69	1582	770.22	403.10	0.40%	8	0.012	0.015	0.950	0.08	0.511	2.8	11.9
1569.1	1569	777.59	1570	776.28	301.60	0.40%	8	0.012	0.000	0.520	0.00	0.558	0.1	0.5
1570.1	1570	776.28	1571	775.76	106.20	0.50%	8	0.012	0.002	0.570	0.01	0.592	0.4	1.5
1571.1	1571	775.76	1572	772.54	28.80	11.20%	8	0.012	0.002	0.540	0.01	2.831	0.1	0.8
1572.1	1572	772.54	1568	771.69	221.30	0.40%	8	0.012	0.012	0.900	0.06	0.524	2.3	9.1
1573.1	1573	786.51	1574	773.78	402.20	3.20%	8	0.012	0.000	0.520	0.00	1.505	0.0	0.5
1574.1	1574	773.78	1572	772.54	336.70	0.40%	8	0.012	0.010	0.830	0.07	0.513	2.0	10.2
1575.1	1575	788.06	1576	782.82	262.10	2.00%	8	0.012	0.001	0.520	0.53	1.196	0.1	79.2
1576.1	1576	782.82	1577	774.37	192.60	4.40%	8	0.012	0.002	0.550	0.01	1.772	0.1	1.0
1577.1	1577	774.37	1574	773.78	142.70	0.40%	8	0.012	0.008	0.770	0.04	0.544	1.5	6.1
1578.1	1578	785.47	1579	776.25	280.30	3.30%	8	0.012	0.001	0.530	0.67	1.535	0.1	100.0
1579.1	1579	776.25	1580	775.51	188.80	0.40%	8	0.012	0.006	0.690	0.03	0.530	1.1	4.4
1580.1	1580	775.51	1577	774.37	307.30	0.40%	8	0.012	0.006	0.770	0.04	0.515	1.1	6.7
1581.1	1581	777.02	1579	776.25	196.70	0.40%	8	0.012	0.003	0.600	0.01	0.529	0.6	2.1
1582.1	1582	770.22	1738	769.67	131.60	0.40%	8	0.012	0.018	0.980	0.09	0.547	3.3	13.5
1583.1	1583	666.00	393	662.46	503.90	0.70%	8	0.012	0.001	0.530	0.00	0.709	0.1	0.6
1584.1	1584	803.68	2326	799.69	197.50	2.00%	8	0.012	0.003	0.630	0.02	1.203	0.2	3.3
1585.1	1585	796.34	1586	768.98	124.30	22.00%	8	0.012	0.005	0.570	0.01	3.969	0.1	1.0
1586.1	1586	768.98	527	764.66	13.60	31.80%	8	0.012	0.005	0.570	0.01	4.774	0.1	1.0
1587.1	1587	729.99	1590	729.55	77.20	0.60%	8	0.012	0.012	0.910	0.06	0.639	1.9	9.3
1588.1	1588	727.30	2117	726.18	261.60	0.40%	12	0.012	0.076	1.360	0.28	1.632	4.7	27.9
1589.1	1589	759.51	528	758.33	317.10	0.40%	8	0.012	0.000	0.310	0.00	0.516	0.0	0.4
1590.1	1590	729.55	549	728.76	180.80	0.40%	10	0.012	0.017	0.950	0.06	1.014	1.6	7.7
1591.1	1591	765.00	1592	757.70	260.90	2.80%	8	0.012	0.000	0.250	0.67	1.415	0.0	100.0
1592.1	1592	757.70	1593	745.25	479.60	2.60%	8	0.012	0.001	0.530	0.67	1.363	0.1	100.0
1593.1	1593	745.25	1594	737.88	500.00	1.50%	8	0.012	0.002	0.540	0.01	1.027	0.2	0.8
1594.1	1594	737.88	1590	729.55	154.90	5.40%	8	0.012	0.004	0.590	0.01	1.962	0.2	1.9
1595.1	1595	755.96	1596	750.87	333.10	1.50%	10	0.012	0.020	0.970	0.06	1.896	1.1	7.5
1596.1	1596	750.87	1597	746.45	357.70	1.20%	10	0.012	0.021	1.040	0.39	1.705	1.2	47.1
1597.1	1597	746.45	1598	744.53	138.40	1.40%	10	0.012	0.021	1.060	0.08	1.807	1.2	9.4
1598.1	1598	744.53	1599	742.12	118.30	2.00%	10	0.012	0.022	1.070	0.08	2.189	1.0	9.6
1599.1	1599	742.12	1600	737.31	235.10	2.00%	10	0.012	0.023	1.100	0.08	2.194	1.1	10.2
1600.1	1600	737.31	1601	736.00	240.60	0.50%	10	0.012	0.024	1.020	0.10	1.132	2.1	11.8
1601.1	1601	736.00	1613	734.57	190.70	0.70%	10	0.012	0.028	1.040	0.11	1.328	2.1	12.9

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1602.1	1602	747.43	1603	745.01	289.20	0.80%	8	0.012	0.000	0.190	0.24	0.774	0.0	36.7
1603.1	1603	745.01	1599	742.12	361.20	0.80%	8	0.012	0.001	0.530	0.21	0.757	0.1	31.6
1604.1	1604	746.67	1606	740.79	222.00	2.60%	8	0.012	0.000	0.120	0.00	1.377	0.0	0.3
1605.1	1605	741.12	1606	740.79	69.10	0.50%	8	0.012	0.000	0.120	0.00	0.585	0.0	0.3
1606.1	1606	740.79	1607	739.77	282.70	0.40%	8	0.012	0.001	0.520	0.11	0.508	0.1	15.9
1607.1	1607	739.77	1608	738.89	234.90	0.40%	8	0.012	0.001	0.530	0.00	0.518	0.2	0.7
1608.1	1608	738.89	1609	738.59	58.60	0.50%	8	0.012	0.002	0.540	0.01	0.605	0.3	0.8
1609.1	1609	738.59	1611	737.84	230.50	0.30%	8	0.012	0.002	0.540	0.01	0.483	0.4	0.8
1610.1	1610	738.82	1611	737.84	176.80	0.60%	8	0.012	0.000	0.250	0.00	0.630	0.0	0.4
1611.1	1611	737.84	1612	737.46	55.60	0.70%	8	0.012	0.003	0.590	0.01	0.699	0.4	2.0
1612.1	1612	737.46	1601	736.00	273.40	0.50%	8	0.012	0.003	0.550	0.15	0.618	0.5	22.8
1613.1	1613	734.57	1614	732.92	156.50	1.10%	10	0.012	0.028	1.190	0.10	1.575	1.8	11.8
1614.1	1614	732.92	1615	731.78	113.70	1.00%	10	0.012	0.028	1.170	0.10	1.536	1.9	12.1
1615.1	1615	731.78	1588	727.30	501.00	0.90%	10	0.012	0.059	1.590	0.13	1.451	4.1	16.2
1616.1	1616	739.40	1615	731.78	499.90	1.50%	10	0.012	0.030	1.200	0.09	1.894	1.6	11.3
1617.1	1617	748.20	1616	739.40	529.30	1.70%	10	0.012	0.030	1.190	0.09	1.978	1.5	10.9
1618.1	1618	731.58	1588	727.30	255.70	1.70%	10	0.012	0.000	0.170	0.43	1.985	0.0	51.6
1619.1	1619	727.53	2117	726.18	25.90	5.20%	8	0.012	0.008	0.670	0.02	1.930	0.4	3.3
1620.1	1620	728.10	1619	727.53	94.20	0.60%	8	0.012	0.008	0.750	0.04	0.658	1.1	5.7
1621.1	1621	728.29	1620	728.10	18.90	1.00%	8	0.012	0.008	0.710	0.03	0.849	0.9	4.4
1622.1	1622	731.38	1621	728.29	373.50	0.80%	8	0.012	0.006	0.680	0.25	0.770	0.8	37.0
1623.1	1623	732.87	1622	731.38	278.80	0.50%	8	0.012	0.005	0.690	0.18	0.619	0.7	27.0
1624.1	1624	734.33	1623	732.87	271.80	0.50%	8	0.012	0.003	0.640	0.17	0.620	0.5	25.3
1625.1	1625	735.32	1624	734.33	269.70	0.40%	8	0.012	0.002	0.630	0.12	0.513	0.4	18.3
1626.1	1626	735.99	1625	735.32	172.50	0.40%	8	0.012	0.000	0.250	0.00	0.527	0.0	0.4
1627.1	1627	737.14	1625	735.32	521.70	0.30%	8	0.012	0.001	0.530	0.00	0.500	0.2	0.6
1628.1	1628	739.22	1627	737.14	263.40	0.80%	8	0.012	0.000	0.120	0.21	0.752	0.0	31.5
1629.1	1629	735.42	1624	734.33	301.50	0.40%	8	0.012	0.000	0.250	0.00	0.509	0.0	0.4
1630.1	1630	735.44	1623	732.87	308.20	0.80%	8	0.012	0.000	0.250	0.00	0.773	0.0	0.4
1631.1	1631	733.92	1622	731.38	488.60	0.50%	8	0.012	0.000	0.120	0.14	0.610	0.0	21.5
1632.1	1632	732.70	1621	728.29	263.80	1.70%	8	0.012	0.000	0.310	0.44	1.094	0.0	66.6
1633.1	1633	756.40	1595	755.96	168.50	0.30%	10	0.012	0.020	0.890	0.10	0.784	2.6	11.5
1634.1	1634	756.49	1633	756.40	25.20	0.40%	8	0.012	0.003	0.210	0.08	0.505	0.6	11.3
1635.1	1635	760.40	1657	757.10	98.60	3.30%	8	0.012	0.000	0.060	0.00	1.548	0.0	0.3
1636.1	1636	755.00	1638	751.43	56.40	6.30%	8	0.012	0.000	0.250	0.00	2.129	0.0	0.4
1637.1	1637	752.50	1639	751.10	240.90	0.60%	8	0.012	0.000	0.250	0.00	0.645	0.0	0.4
1638.1	1638	751.43	1639	751.10	45.40	0.70%	8	0.012	0.000	0.490	0.00	0.721	0.1	0.5
1639.1	1639	751.10	1042	739.84	423.90	2.70%	8	0.012	0.001	0.530	0.00	1.379	0.1	0.7
1640.1	1640	745.60	1646	732.92	351.40	3.60%	8	0.012	0.002	0.550	0.67	1.607	0.1	100.0
1641.1	1641	749.40	1640	745.60	380.10	1.00%	8	0.012	0.000	0.520	0.27	0.846	0.1	41.2

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1642.1	1642	748.77	1047	743.51	148.30	3.50%	8	0.012	0.000	0.000	0.00	1.594	0.0	0.0
1643.1	1643	730.04	1058	726.23	211.80	1.80%	8	0.012	0.005	0.670	0.03	1.135	0.5	3.8
1644.1	1644	731.25	1643	730.04	292.50	0.40%	8	0.012	0.004	0.710	0.16	0.544	0.8	23.6
1645.1	1645	732.20	1647	731.79	78.60	0.50%	8	0.012	0.004	0.640	0.02	0.611	0.6	3.3
1646.1	1646	732.92	1645	732.20	192.30	0.40%	8	0.012	0.003	0.600	0.01	0.518	0.6	2.1
1647.1	1647	731.79	1644	731.25	112.00	0.50%	8	0.012	0.004	0.640	0.02	0.588	0.7	3.2
1648.1	1648	756.29	1009	738.36	331.70	5.40%	8	0.012	0.004	0.590	0.01	1.967	0.2	1.9
1649.1	1649	733.04	1059	724.55	344.00	2.50%	8	0.012	0.000	0.200	0.00	1.329	0.0	0.4
1650.1	1650	711.15	1004	709.38	359.40	0.50%	8	0.012	0.008	0.780	0.17	0.594	1.3	25.6
1651.1	1651	763.80	1656	758.17	366.10	1.50%	8	0.011	0.000	0.390	0.41	1.145	0.0	60.8
1652.1	1652	772.23	1653	767.28	240.70	2.10%	8	0.011	0.000	0.390	0.00	1.324	0.0	0.4
1653.1	1653	767.28	1654	764.57	104.50	2.60%	8	0.011	0.001	0.530	0.00	1.486	0.1	0.7
1654.1	1654	764.57	1655	763.08	56.80	2.60%	8	0.011	0.001	0.530	0.00	1.495	0.1	0.7
1655.1	1655	763.08	1656	758.17	187.80	2.60%	8	0.011	0.001	0.530	0.00	1.492	0.1	0.7
1656.1	1656	758.17	1648	756.29	113.20	1.70%	8	0.012	0.003	0.560	0.01	1.090	0.3	1.1
1657.1	1657	757.10	1634	756.49	65.60	0.90%	8	0.012	0.003	0.580	0.01	0.816	0.4	1.7
1658.1	1658	758.27	1657	757.10	123.50	0.90%	8	0.011	0.003	0.560	0.01	0.899	0.3	1.3
1659.1	1659	760.49	1658	758.27	87.50	2.50%	8	0.011	0.002	0.540	0.01	1.470	0.1	0.8
1660.1	1660	761.55	1659	760.49	131.20	0.80%	8	0.011	0.002	0.540	0.00	0.830	0.2	0.7
1661.1	1661	766.30	1660	761.55	189.80	2.50%	8	0.011	0.000	0.190	0.00	1.460	0.0	0.4
1662.1	1662	767.43	1663	764.59	147.20	1.90%	8	0.011	0.000	0.190	0.00	1.282	0.0	0.4
1663.1	1663	764.59	1660	761.55	146.40	2.10%	8	0.011	0.001	0.530	0.00	1.330	0.1	0.6
1664.1	1664	767.85	1663	764.59	158.10	2.10%	8	0.011	0.000	0.370	0.00	1.326	0.0	0.4
1665.1	1665	759.84	1666	758.88	215.80	0.40%	8	0.011	0.000	0.190	0.00	0.616	0.0	0.4
1666.1	1666	758.88	1658	758.27	154.50	0.40%	8	0.011	0.001	0.520	0.00	0.580	0.1	0.5
1667.1	1667	795.34	1668	788.40	132.00	5.30%	8	0.012	0.000	0.000	0.00	1.940	0.0	0.0
1668.1	1668	788.40	1669	785.36	58.20	5.20%	8	0.012	0.000	0.520	0.00	1.934	0.0	0.5
1669.1	1669	785.36	1670	782.04	51.80	6.40%	8	0.012	0.001	0.520	0.00	2.141	0.0	0.5
1670.1	1670	782.04	1680	775.25	154.80	4.40%	8	0.012	0.001	0.520	0.00	1.772	0.0	0.6
1671.1	1671	798.71	1672	785.86	275.20	4.70%	8	0.012	0.000	0.370	0.67	1.828	0.0	100.0
1672.1	1672	785.86	1679	776.85	207.70	4.30%	8	0.012	0.001	0.530	0.00	1.762	0.1	0.6
1673.1	1673	814.15	1983	809.88	138.90	3.10%	8	0.012	0.000	0.250	0.00	1.484	0.0	0.4
1674.1	1674	799.03	1677	790.66	230.70	3.60%	8	0.012	0.001	0.530	0.00	1.611	0.1	0.7
1675.1	1675	791.65	1676	791.14	126.20	0.40%	8	0.012	0.004	0.620	0.02	0.538	0.7	2.9
1676.1	1676	791.14	1677	790.66	70.80	0.70%	8	0.012	0.004	0.620	0.02	0.697	0.5	2.8
1677.1	1677	790.66	1678	783.02	252.10	3.00%	8	0.012	0.005	0.650	0.67	1.473	0.4	100.0
1678.1	1678	783.02	1679	776.85	207.00	3.00%	8	0.012	0.006	0.650	0.02	1.461	0.4	3.0
1679.1	1679	776.85	1680	775.25	296.50	0.50%	8	0.012	0.007	0.780	0.20	0.622	1.2	30.7
1680.1	1680	775.25	1681	773.90	379.20	0.40%	8	0.012	0.009	0.830	0.15	0.505	1.7	22.2
1681.1	1681	773.90	1699	772.59	64.50	2.00%	8	0.012	0.010	0.780	0.04	1.206	0.8	6.1

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1682.1	1682	761.80	1684	750.54	359.10	3.10%	8	0.012	0.005	0.630	0.67	1.498	0.4	100.0
1683.1	1683	764.02	1682	761.80	423.70	0.50%	8	0.012	0.000	0.250	0.00	0.612	0.0	0.4
1684.1	1684	750.54	1695	749.57	278.10	0.30%	8	0.012	0.040	0.960	0.26	0.500	8.1	38.7
1685.1	1685	750.94	1684	750.54	111.60	0.40%	8	0.012	0.035	0.900	0.15	0.506	6.8	22.6
1686.1	1686	770.62	1682	761.80	224.20	3.90%	8	0.012	0.002	0.550	0.01	1.678	0.1	1.0
1687.1	1687	783.57	1688	773.61	179.50	5.50%	8	0.012	0.000	0.200	0.00	1.993	0.0	0.4
1688.1	1688	773.61	1686	770.62	286.90	1.00%	8	0.012	0.002	0.540	0.30	0.864	0.3	45.7
1689.1	1689	774.18	1688	773.61	116.40	0.50%	8	0.012	0.000	0.200	0.00	0.592	0.0	0.4
1690.1	1690	752.13	1685	750.94	255.90	0.50%	8	0.012	0.030	0.900	0.26	0.577	5.3	38.5
1691.1	1691	759.23	1685	750.94	291.80	2.80%	8	0.012	0.003	0.590	0.67	1.426	0.2	100.0
1692.1	1692	765.66	1691	759.23	359.20	1.80%	8	0.012	0.000	0.390	0.46	1.132	0.0	69.3
1693.1	1693	753.55	1690	752.13	378.00	0.40%	8	0.012	0.030	0.850	0.24	0.519	5.9	36.6
1694.1	1694	755.39	1693	753.55	496.90	0.40%	8	0.012	0.030	0.840	0.25	0.515	5.9	37.1
1695.1	1695	749.57	1016	748.65	232.20	0.40%	8	0.012	0.041	1.060	0.15	0.533	7.8	22.9
1696.1	1696	764.27	1698	763.77	164.60	0.30%	10	0.012	0.000	0.060	0.00	0.846	0.0	0.2
1697.1	1697	764.22	1698	763.77	95.50	0.50%	8	0.012	0.000	0.190	0.00	0.581	0.0	0.4
1698.1	1698	763.77	1700	762.94	291.30	0.30%	10	0.012	0.012	0.890	0.15	0.819	1.4	17.8
1699.1	1699	772.59	1698	763.77	320.00	2.80%	8	0.012	0.010	0.720	0.03	1.405	0.7	4.4
1700.1	1700	762.94	1701	762.42	166.70	0.30%	10	0.012	0.013	0.870	0.05	0.857	1.5	6.5
1701.1	1701	762.42	1707	761.90	170.40	0.30%	10	0.012	0.013	0.880	0.06	0.847	1.5	6.7
1702.1	1702	776.80	1708	765.70	366.10	3.00%	8	0.012	0.000	0.190	0.67	1.473	0.0	100.0
1703.1	1703	760.00	2123	756.79	440.70	0.70%	10	0.012	0.016	0.990	0.07	1.309	1.3	8.7
1704.1	1704	771.50	1705	760.49	187.00	5.90%	8	0.012	0.000	0.310	0.00	2.053	0.0	0.4
1705.1	1705	760.49	1703	760.00	196.20	0.20%	10	0.012	0.016	0.960	0.08	0.767	2.1	9.5
1706.1	1706	761.05	1705	760.49	226.90	0.20%	10	0.012	0.015	0.960	0.07	0.762	2.0	8.2
1707.1	1707	761.90	1706	761.05	296.70	0.30%	10	0.012	0.014	0.830	0.16	0.821	1.7	19.8
1708.1	1708	765.70	1707	761.90	148.80	2.60%	8	0.012	0.001	0.530	0.00	1.352	0.1	0.6
1709.1	1709	821.25	1710	819.73	35.10	4.30%	8	0.012	0.000	0.190	0.00	1.760	0.0	0.4
1710.1	1710	819.73	1711	816.07	93.70	3.90%	8	0.012	0.000	0.310	0.00	1.672	0.0	0.4
1711.1	1711	816.07	1712	812.67	123.30	2.80%	8	0.012	0.000	0.520	0.00	1.405	0.0	0.5
1712.1	1712	812.67	1716	803.41	277.60	3.30%	8	0.012	0.001	0.530	0.67	1.545	0.1	100.0
1713.1	1713	814.73	1712	812.67	55.80	3.70%	8	0.012	0.000	0.490	0.00	1.625	0.0	0.5
1714.1	1714	812.48	1715	808.30	136.00	3.10%	8	0.012	0.000	0.120	0.00	1.483	0.0	0.3
1715.1	1715	808.30	1716	803.41	136.90	3.60%	8	0.012	0.000	0.310	0.00	1.599	0.0	0.4
1716.1	1716	803.41	1717	794.83	327.40	2.60%	8	0.012	0.002	0.580	0.01	1.370	0.2	2.0
1717.1	1717	794.83	1721	793.05	175.70	1.00%	8	0.012	0.003	0.570	0.01	0.852	0.3	1.6
1718.1	1718	797.49	1717	794.83	85.30	3.10%	8	0.012	0.000	0.190	0.00	1.494	0.0	0.4
1719.1	1719	792.47	1675	791.65	188.50	0.40%	8	0.012	0.004	0.600	0.02	0.558	0.6	2.3
1720.1	1720	792.78	1719	792.47	62.90	0.50%	8	0.012	0.004	0.630	0.02	0.594	0.6	3.2
1721.1	1721	793.05	1720	792.78	52.30	0.50%	8	0.012	0.003	0.630	0.02	0.608	0.6	3.1

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1722.1	1722	793.58	1721	793.05	75.20	0.70%	8	0.012	0.000	0.190	0.00	0.711	0.0	0.4
1723.1	1723	789.92	1724	786.77	122.40	2.60%	8	0.012	0.000	0.200	0.00	1.357	0.0	0.4
1724.1	1724	786.77	1728	782.22	147.80	3.10%	8	0.012	0.001	0.530	0.00	1.485	0.1	0.6
1725.1	1725	786.81	1724	786.77	72.30	0.10%	8	0.012	0.000	0.200	0.00	0.199	0.1	0.4
1726.1	1726	788.06	1730	776.85	335.20	3.30%	8	0.012	0.000	0.520	0.00	1.547	0.0	0.5
1727.1	1727	789.34	1726	788.06	91.30	1.40%	8	0.012	0.000	0.390	0.00	1.002	0.0	0.4
1728.1	1728	782.22	1729	777.71	160.40	2.80%	8	0.012	0.001	0.530	0.00	1.419	0.1	0.7
1729.1	1729	777.71	1737	773.96	134.30	2.80%	8	0.011	0.002	0.540	0.01	1.542	0.1	0.9
1730.1	1730	776.85	1732	771.82	169.90	3.00%	8	0.011	0.001	0.530	0.00	1.588	0.1	0.7
1731.1	1731	771.20	1733	765.36	189.40	3.10%	8	0.011	0.003	0.560	0.01	1.621	0.2	1.2
1732.1	1732	771.82	1735	770.51	41.00	3.20%	8	0.011	0.002	0.550	0.01	1.650	0.1	1.0
1733.1	1733	765.36	1736	762.09	125.50	2.60%	8	0.012	0.006	0.700	0.03	1.366	0.4	4.6
1734.1	1734	766.38	1733	765.36	29.00	3.50%	8	0.011	0.003	0.570	0.01	1.730	0.2	1.3
1735.1	1735	770.51	1734	766.38	138.60	3.00%	8	0.011	0.002	0.550	0.01	1.593	0.1	1.0
1736.1	1736	762.09	1694	755.39	336.40	2.00%	8	0.012	0.024	1.100	0.08	1.194	2.0	12.5
1737.1	1737	773.96	1731	771.20	96.20	2.90%	8	0.011	0.002	0.550	0.01	1.564	0.1	1.0
1738.1	1738	769.67	1736	762.09	299.00	2.50%	8	0.012	0.018	0.940	0.06	1.347	1.3	9.0
1739.1	1739	784.67	1740	783.72	103.90	0.90%	8	0.011	0.000	0.390	0.00	0.883	0.0	0.4
1740.1	1740	783.72	1741	782.71	113.80	0.90%	8	0.011	0.001	0.520	0.00	0.870	0.1	0.6
1741.1	1741	782.71	1751	769.20	242.80	5.60%	8	0.011	0.001	0.530	0.00	2.177	0.0	0.6
1742.1	1742	790.56	1743	787.62	282.20	1.00%	8	0.011	0.000	0.520	0.30	0.942	0.0	44.6
1743.1	1743	787.62	1746	786.85	166.70	0.50%	8	0.011	0.002	0.560	0.01	0.627	0.3	1.3
1744.1	1744	787.96	1743	787.62	61.90	0.50%	8	0.011	0.000	0.520	0.00	0.684	0.1	0.5
1745.1	1745	788.38	1744	787.96	88.50	0.50%	8	0.011	0.000	0.200	0.00	0.636	0.0	0.4
1746.1	1746	786.85	1747	786.32	111.70	0.50%	8	0.011	0.002	0.570	0.01	0.636	0.3	1.6
1747.1	1747	786.32	1748	778.00	210.10	4.00%	8	0.011	0.005	0.610	0.01	1.837	0.3	2.2
1748.1	1748	778.00	1749	771.22	253.90	2.70%	8	0.011	0.007	0.670	0.67	1.508	0.4	100.0
1749.1	1749	771.22	1750	769.67	361.00	0.40%	8	0.011	0.019	0.990	0.20	0.605	3.1	30.3
1750.1	1750	769.67	1751	769.20	76.00	0.60%	8	0.011	0.021	1.120	0.09	0.726	2.9	13.6
1751.1	1751	769.20	2153	765.73	330.50	1.00%	8	0.011	0.026	1.160	0.09	0.946	2.7	13.8
1752.1	1752	780.76	1753	776.88	210.50	1.80%	8	0.011	0.000	0.200	0.00	1.253	0.0	0.4
1753.1	1753	776.88	1754	770.50	78.50	8.10%	8	0.011	0.001	0.520	0.00	2.631	0.0	0.6
1754.1	1754	770.50	1756	765.86	87.70	5.30%	8	0.011	0.002	0.540	0.01	2.123	0.1	0.8
1755.1	1755	772.92	1754	770.50	178.10	1.40%	8	0.011	0.000	0.520	0.00	1.076	0.0	0.5
1756.1	1756	765.86	1757	765.76	287.70	0.00%	8	0.011	0.002	0.540	0.02	0.172	1.2	2.3
1757.1	1757	765.76	1758	764.46	364.70	0.40%	8	0.011	0.003	0.610	0.11	0.551	0.5	16.6
1758.1	1758	764.46	1759	763.58	236.40	0.40%	8	0.011	0.004	0.630	0.02	0.563	0.8	2.7
1759.1	1759	763.58	2152	761.61	539.00	0.40%	8	0.011	0.006	0.710	0.03	0.558	1.0	5.0
1760.1	1760	764.54	1761	760.09	417.90	1.10%	8	0.011	0.000	0.390	0.00	0.952	0.0	0.4
1761.1	1761	760.09	1763	757.62	297.00	0.80%	10	0.011	0.002	0.570	0.26	1.526	0.1	31.0

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1762.1	1762	762.54	1763	757.62	283.20	1.70%	8	0.011	0.000	0.390	0.49	1.217	0.0	74.2
1763.1	1763	757.62	1764	755.12	300.50	0.80%	10	0.011	0.004	0.620	0.02	1.526	0.2	2.2
1764.1	1764	755.12	1766	753.22	299.20	0.60%	10	0.011	0.005	0.650	0.02	1.334	0.4	2.6
1765.1	1765	761.60	1764	755.12	251.70	2.60%	8	0.011	0.000	0.390	0.65	1.481	0.0	97.7
1766.1	1766	753.22	2150	745.79	519.10	1.40%	10	0.011	0.007	0.690	0.03	2.002	0.3	3.4
1767.1	1767	754.21	1766	753.22	91.50	1.10%	8	0.011	0.001	0.530	0.00	0.960	0.1	0.7
1768.1	1768	754.75	1767	754.21	54.90	1.00%	8	0.011	0.001	0.530	0.00	0.915	0.1	0.6
1769.1	1769	755.39	1768	754.75	67.40	0.90%	8	0.011	0.000	0.520	0.00	0.899	0.1	0.5
1770.1	1770	756.18	1769	755.39	86.60	0.90%	8	0.011	0.000	0.200	0.00	0.882	0.0	0.4
1771.1	1771	771.98	1772	771.70	51.50	0.50%	8	0.011	0.000	0.200	0.00	0.681	0.0	0.4
1772.1	1772	771.70	1773	771.45	47.10	0.50%	8	0.011	0.000	0.520	0.00	0.672	0.1	0.5
1773.1	1773	771.45	2153	765.73	566.00	1.00%	8	0.011	0.001	0.520	0.26	0.928	0.1	39.6
1774.1	1774	762.50	1761	760.09	281.00	0.90%	10	0.011	0.000	0.000	0.24	1.550	0.0	28.9
1775.1	1775	710.44	2336	709.82	103.50	0.60%	8	0.011	0.004	0.610	0.02	0.714	0.5	2.6
1776.1	1776	778.63	2194	777.92	179.30	0.40%	8	0.012	0.003	0.580	0.01	0.532	0.5	1.8
1777.1	1777	779.65	1776	778.63	270.40	0.40%	6	0.012	0.000	0.000	0.10	0.241	0.0	20.4
1778.1	1778	608.20	1779	601.01	231.60	3.10%	8	0.011	0.004	0.580	0.01	1.626	0.2	1.5
1779.1	1779	601.01	1780	599.00	382.30	0.50%	8	0.011	0.006	0.710	0.18	0.669	0.9	26.5
1780.1	1780	599.00	LS_BCP4	592.92	130.90	4.60%	8	0.011	0.006	0.040	0.39	1.989	0.3	58.7
1781.1	1781	697.88	1782	697.08	161.30	0.50%	8	0.011	0.002	0.540	0.01	0.650	0.3	0.8
1782.1	1782	697.08	1783	695.34	269.80	0.60%	8	0.011	0.003	0.590	0.19	0.741	0.4	28.1
1783.1	1783	695.34	1784	694.66	116.50	0.60%	8	0.011	0.003	0.660	0.03	0.705	0.4	4.9
1784.1	1784	694.66	1789	693.98	158.90	0.40%	8	0.011	0.015	0.970	0.07	0.604	2.5	10.7
1785.1	1785	705.48	1786	704.00	405.20	0.40%	8	0.011	0.000	0.000	0.00	0.558	0.0	0.0
1786.1	1786	704.00	1787	702.40	302.80	0.50%	8	0.011	0.002	0.580	0.01	0.671	0.3	2.1
1787.1	1787	702.40	2107	697.19	496.10	1.10%	8	0.011	0.003	0.550	0.30	0.946	0.3	44.3
1788.1	1788	695.37	1784	694.66	100.40	0.70%	8	0.011	0.011	0.810	0.05	0.776	1.4	6.8
1789.1	1789	693.98	1790	691.27	261.00	1.00%	8	0.011	0.015	0.890	0.33	0.940	1.6	48.9
1790.1	1790	691.27	1791	685.53	280.50	2.00%	8	0.011	0.015	0.870	0.63	1.320	1.1	93.8
1791.1	1791	685.53	1794	684.55	188.60	0.50%	8	0.011	0.022	1.030	0.10	0.665	3.3	15.0
1792.1	1792	697.62	1793	694.83	251.70	1.10%	8	0.011	0.003	0.550	0.28	0.972	0.3	42.7
1793.1	1793	694.83	1791	685.53	237.90	3.90%	8	0.011	0.003	0.570	0.01	1.825	0.2	1.5
1794.1	1794	684.55	1795	684.12	82.80	0.50%	8	0.011	0.022	1.030	0.10	0.665	3.3	15.0
1795.1	1795	684.12	1797	683.35	132.00	0.60%	8	0.011	0.023	1.120	0.10	0.705	3.2	14.6
1796.1	1796	682.87	1798	677.56	341.30	1.60%	8	0.011	0.023	1.090	0.08	1.151	2.0	12.3
1797.1	1797	683.35	1796	682.87	75.60	0.60%	8	0.011	0.023	1.150	0.10	0.736	3.1	14.4
1798.1	1798	677.56	1799	669.24	132.00	6.30%	8	0.011	0.030	1.090	0.07	2.317	1.3	10.8
1799.1	1799	669.24	1807	668.84	195.90	0.20%	15	0.011	0.069	1.050	0.17	2.229	3.1	13.8
1800.1	1800	670.50	1799	669.24	403.40	0.30%	12	0.011	0.039	0.930	0.14	1.521	2.5	13.7
1801.1	1801	671.60	1800	670.50	399.70	0.30%	12	0.011	0.039	0.880	0.14	1.428	2.7	14.1

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1802.1	1802	672.70	1801	671.60	312.20	0.40%	12	0.011	0.034	0.890	0.13	1.615	2.1	12.9
1803.1	1803	673.14	1802	672.70	165.60	0.30%	12	0.011	0.034	0.820	0.14	1.403	2.4	13.6
1804.1	1804	674.47	1803	673.14	466.80	0.30%	12	0.011	0.031	0.790	0.21	1.453	2.2	20.6
1805.1	1805	675.01	1804	674.47	157.00	0.30%	12	0.011	0.031	0.850	0.13	1.596	2.0	12.5
1806.1	1806	684.49	1805	675.01	423.90	2.20%	8	0.011	0.010	0.780	0.04	1.380	0.7	6.1
1807.1	1807	668.84	28	667.87	455.70	0.20%	15	0.011	0.070	1.060	0.23	2.276	3.1	18.0
1808.1	1808	706.50	1809	698.37	396.30	2.10%	8	0.011	0.020	0.980	0.65	1.322	1.5	97.1
1809.1	1809	698.37	1810	697.33	187.50	0.60%	8	0.011	0.020	1.000	0.10	0.687	2.9	14.3
1810.1	1810	697.33	1813	692.90	243.90	1.80%	8	0.011	0.020	1.000	0.07	1.244	1.6	10.3
1811.1	1811	684.77	1999	683.87	122.10	0.70%	8	0.011	0.020	1.060	0.08	0.792	2.6	12.0
1812.1	1812	685.40	1811	684.77	119.70	0.50%	8	0.011	0.020	1.030	0.09	0.670	3.0	14.2
1813.1	1813	692.90	1812	685.40	239.80	3.10%	8	0.011	0.020	0.970	0.06	1.632	1.2	9.3
1814.1	1814	708.34	1815	706.51	347.60	0.50%	8	0.011	0.000	0.000	0.13	0.670	0.0	19.6
1815.1	1815	706.51	1786	704.00	457.70	0.50%	8	0.011	0.002	0.540	0.14	0.684	0.2	21.7
1816.1	1816	672.02	1817	671.04	175.20	0.60%	8	0.011	0.000	0.520	0.00	0.690	0.1	0.5
1817.1	1817	671.04	1818	669.62	264.20	0.50%	8	0.011	0.002	0.540	0.15	0.677	0.3	22.1
1818.1	1818	669.62	1819	668.07	290.10	0.50%	8	0.011	0.004	0.640	0.18	0.675	0.6	26.4
1819.1	1819	668.07	1820	666.52	289.00	0.50%	8	0.011	0.005	0.680	0.18	0.676	0.8	27.5
1820.1	1820	666.52	1821	664.97	290.60	0.50%	8	0.011	0.006	0.690	0.18	0.674	1.0	27.4
1821.1	1821	664.97	1823	663.44	287.50	0.50%	8	0.011	0.008	0.610	0.16	0.673	1.2	24.2
1822.1	1822	665.65	1821	664.97	115.50	0.60%	8	0.011	0.000	0.000	0.00	0.708	0.0	0.0
1823.1	1823	663.44	1824	663.44	287.00	0.00%	8	0.011	0.010	0.160	0.21	0.000	Infinity	32.2
1824.1	1824	663.44	1825	660.83	193.30	1.30%	8	0.011	0.012	0.760	0.03	1.072	1.1	4.9
1825.1	1825	660.83	1826	660.45	76.40	0.50%	8	0.011	0.013	0.900	0.06	0.651	2.0	9.0
1826.1	1826	660.45	591	658.24	367.00	0.60%	8	0.011	0.014	0.880	0.21	0.716	1.9	31.9
1827.1	1827	670.28	1828	669.17	202.80	0.50%	8	0.011	0.001	0.530	0.00	0.683	0.1	0.6
1828.1	1828	669.17	1829	668.05	202.10	0.60%	8	0.011	0.002	0.570	0.01	0.687	0.3	1.6
1829.1	1829	668.05	1830	663.86	202.30	2.10%	8	0.011	0.004	0.600	0.02	1.328	0.3	2.3
1830.1	1830	663.86	598	663.04	143.90	0.60%	8	0.011	0.005	0.650	0.02	0.697	0.7	3.5
1831.1	1831	672.77	1832	670.63	406.10	0.50%	8	0.011	0.001	0.530	0.00	0.670	0.1	0.6
1832.1	1832	670.63	1833	669.42	224.00	0.50%	8	0.011	0.003	0.630	0.02	0.678	0.5	3.2
1833.1	1833	669.42	599	668.76	123.40	0.50%	8	0.011	0.005	0.660	0.02	0.675	0.7	3.6
1834.1	1834	674.96	1835	673.26	319.50	0.50%	8	0.011	0.000	0.520	0.00	0.673	0.1	0.5
1835.1	1835	673.26	601	671.23	139.10	1.50%	8	0.011	0.003	0.550	0.01	1.115	0.2	1.0
1836.1	1836	662.52	1837	660.16	181.00	1.30%	10	0.011	0.079	1.750	0.13	1.911	4.1	15.5
1837.1	1837	660.16	1842	654.96	439.40	1.20%	10	0.011	0.079	1.770	0.13	1.820	4.3	15.9
1838.1	1838	648.77	1839	647.53	173.00	0.70%	10	0.011	0.157	2.410	0.20	1.417	11.1	24.0
1839.1	1839	647.53	1840	645.67	342.20	0.50%	10	0.011	0.255	2.600	0.27	1.234	20.6	32.1
1840.1	1840	645.67	1841	645.43	46.70	0.50%	12	0.011	0.255	2.470	0.26	1.951	13.1	25.7
1841.1	1841	645.43	1422	644.14	276.40	0.50%	12	0.011	0.271	2.470	0.40	1.859	14.6	39.8

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1842.1	1842	654.96	1420	652.06	222.00	1.30%	10	0.011	0.080	1.770	0.13	1.913	4.2	15.5
1843.1	1843	711.94	1844	703.89	497.10	1.60%	10	0.011	0.304	3.960	0.67	2.130	14.3	80.1
1844.1	1844	703.89	982	688.02	518.30	3.10%	10	0.011	0.370	4.430	0.21	2.928	12.6	25.6
1845.1	1845	611.16	2195	610.09	107.30	1.00%	8	0.011	0.070	1.700	0.13	0.922	7.6	19.9
1846.1	1846	614.54	1845	611.16	269.80	1.30%	8	0.012	0.070	1.700	0.47	0.947	7.4	70.6
1847.1	1847	615.68	1846	614.54	235.60	0.50%	8	0.012	0.070	1.570	0.17	0.589	11.8	25.0
1848.1	1848	616.57	1847	615.68	135.50	0.70%	8	0.012	0.070	1.730	0.16	0.686	10.2	23.4
1849.1	1849	624.02	1848	616.57	369.20	2.00%	8	0.012	0.070	1.620	0.65	1.202	5.8	97.4
1850.1	1850	626.59	1849	624.02	494.80	0.50%	8	0.012	0.057	1.430	0.30	0.610	9.3	44.6
1851.1	1851	627.24	1850	626.59	110.30	0.60%	8	0.012	0.056	1.480	0.15	0.650	8.6	22.4
1852.1	1852	630.98	1851	627.24	182.20	2.10%	8	0.012	0.055	1.460	0.11	1.212	4.5	16.1
1853.1	1853	636.28	1852	630.98	259.90	2.00%	8	0.012	0.051	1.440	0.64	1.208	4.2	95.8
1854.1	1854	638.98	1853	636.28	259.70	1.00%	8	0.012	0.048	1.490	0.39	0.863	5.5	59.2
1855.1	1855	642.59	1854	638.98	350.20	1.00%	8	0.012	0.015	0.870	0.31	0.859	1.7	46.4
1856.1	1856	644.38	1855	642.59	169.20	1.10%	6	0.012	0.013	0.910	0.06	0.404	3.3	12.2
1857.1	1857	653.48	1856	644.38	497.90	1.80%	6	0.012	0.009	0.790	0.04	0.531	1.7	8.7
1858.1	1858	665.99	1857	653.48	502.10	2.50%	6	0.012	0.005	0.660	0.02	0.620	0.8	4.9
1859.1	1859	676.17	1858	665.99	336.00	3.00%	6	0.012	0.003	0.580	0.01	0.684	0.4	2.5
1860.1	1860	681.49	1859	676.17	170.60	3.10%	6	0.012	0.001	0.530	0.00	0.694	0.1	0.9
1861.1	1861	634.42	1849	624.02	89.20	11.70%	6	0.012	0.009	0.720	0.03	1.342	0.7	5.9
1862.1	1862	644.30	1861	634.42	330.00	3.00%	6	0.012	0.006	0.680	0.03	0.680	0.9	5.4
1863.1	1863	657.14	1862	644.30	364.80	3.50%	6	0.012	0.004	0.590	0.50	0.737	0.5	100.0
1864.1	1864	664.18	1863	657.14	558.30	1.30%	6	0.012	0.000	0.410	0.32	0.441	0.1	64.6
1865.1	1865	648.25	1881	646.99	48.30	2.60%	6	0.012	0.000	0.410	0.00	0.634	0.0	0.6
1866.1	1866	643.19	1853	636.28	375.50	1.80%	6	0.012	0.001	0.520	0.50	0.533	0.1	99.4
1867.1	1867	634.84	1852	630.98	374.30	1.00%	6	0.012	0.001	0.520	0.28	0.399	0.1	55.9
1868.1	1868	649.81	1881	646.99	542.10	0.50%	6	0.012	0.025	1.010	0.12	0.283	8.7	24.8
1869.1	1869	651.05	1868	649.81	229.00	0.50%	6	0.012	0.023	1.060	0.11	0.289	8.0	22.8
1870.1	1870	658.17	1869	651.05	292.00	2.40%	6	0.012	0.019	1.010	0.50	0.613	3.1	100.0
1871.1	1871	665.29	1870	658.17	293.00	2.40%	6	0.012	0.015	0.900	0.50	0.612	2.4	100.0
1872.1	1872	672.40	1871	665.29	292.00	2.40%	6	0.012	0.010	0.790	0.50	0.613	1.6	100.0
1873.1	1873	673.74	1872	672.40	82.30	1.60%	6	0.012	0.006	0.670	0.03	0.501	1.2	5.1
1874.1	1874	676.96	1873	673.74	208.30	1.50%	6	0.012	0.005	0.650	0.02	0.488	1.0	4.4
1875.1	1875	680.67	1874	676.96	449.90	0.80%	6	0.012	0.002	0.540	0.21	0.357	0.5	42.2
1876.1	1876	679.07	1872	672.40	436.70	1.50%	6	0.012	0.002	0.540	0.00	0.486	0.3	1.0
1877.1	1877	671.36	1871	665.29	397.00	1.50%	6	0.012	0.001	0.530	0.44	0.486	0.3	87.7
1878.1	1878	666.15	1870	658.17	358.10	2.20%	6	0.012	0.001	0.530	0.50	0.586	0.2	100.0
1879.1	1879	663.46	1880	660.85	83.70	3.10%	6	0.012	0.000	0.410	0.00	0.694	0.0	0.6
1880.1	1880	660.85	1869	651.05	323.40	3.00%	6	0.012	0.002	0.540	0.00	0.684	0.2	1.0
1881.1	1881	646.99	1854	638.98	329.30	2.40%	6	0.012	0.029	1.190	0.09	0.613	4.7	18.6

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1882.1	1882	660.60	1883	659.58	183.30	0.60%	8	0.011	0.001	0.530	0.00	0.689	0.1	0.6
1883.1	1883	659.58	1898	659.19	60.00	0.60%	8	0.011	0.002	0.560	0.01	0.744	0.3	1.4
1884.1	1884	657.85	1885	656.10	327.50	0.50%	8	0.011	0.008	0.770	0.04	0.675	1.2	6.1
1885.1	1885	656.10	1886	654.21	362.30	0.50%	8	0.011	0.012	0.880	0.19	0.667	1.8	28.7
1886.1	1886	654.21	1896	652.86	249.00	0.50%	8	0.011	0.014	0.910	0.20	0.680	2.1	29.3
1887.1	1887	658.79	1884	657.85	81.40	1.20%	8	0.011	0.000	0.380	0.00	0.992	0.0	0.4
1888.1	1888	667.79	1898	659.19	172.00	5.00%	8	0.011	0.002	0.560	0.01	2.064	0.1	1.2
1889.1	1889	663.56	1884	657.85	255.70	2.20%	8	0.011	0.002	0.540	0.58	1.379	0.1	86.4
1890.1	1890	661.02	1885	656.10	148.10	3.30%	8	0.011	0.002	0.540	0.01	1.682	0.1	0.8
1891.1	1891	653.36	1896	652.86	75.70	0.70%	8	0.011	0.000	0.380	0.00	0.750	0.0	0.4
1892.1	1892	658.58	1897	651.13	75.00	9.90%	8	0.011	0.000	0.380	0.00	2.910	0.0	0.4
1893.1	1893	661.90	1897	651.13	183.20	5.90%	8	0.011	0.001	0.530	0.00	2.238	0.0	0.6
1894.1	1894	649.18	1895	647.35	343.90	0.50%	8	0.011	0.022	1.100	0.09	0.673	3.2	13.1
1895.1	1895	647.35	675	633.86	301.00	4.50%	8	0.011	0.024	0.940	0.05	1.954	1.2	7.5
1896	1896	652.86	1897	651.13	290.90	0.60%	8	0.011	0.017	0.990	0.24	0.712	2.3	36.7
1897.1	1897	651.13	1894	649.18	370.30	0.50%	8	0.011	0.019	1.060	0.22	0.670	2.9	33.3
1898.1	1898	659.19	1884	657.85	244.80	0.50%	8	0.011	0.005	0.660	0.02	0.683	0.7	3.7
1899.1	1899	640.46	677	635.70	186.60	2.60%	8	0.011	0.005	0.620	0.02	1.474	0.4	2.4
1900.1	1900	649.21	1899	640.46	350.90	2.50%	8	0.011	0.003	0.560	0.63	1.457	0.2	95.0
1901.1	1901	652.97	1900	649.21	251.30	1.50%	8	0.011	0.001	0.530	0.38	1.129	0.1	57.1
1902.1	1902	641.58	1903	638.15	227.60	1.50%	8	0.011	0.000	0.520	0.00	1.133	0.0	0.5
1903.1	1903	638.15	1906	633.37	375.10	1.30%	10	0.011	0.010	0.740	0.37	1.889	0.5	45.0
1904.1	1904	638.42	1903	638.15	33.80	0.80%	10	0.011	0.008	0.710	0.03	1.495	0.5	3.7
1905.1	1905	639.17	1904	638.42	130.00	0.60%	10	0.011	0.008	0.760	0.04	1.271	0.6	4.8
1906.1	1906	633.37	1907	628.36	371.30	1.30%	10	0.011	0.012	0.790	0.40	1.944	0.6	47.7
1907.1	1907	628.36	664	622.20	305.50	2.00%	10	0.012	0.015	0.890	0.05	2.178	0.7	6.4
1908.1	1908	701.76	1909	686.41	497.90	3.10%	8	0.011	0.000	0.000	0.00	1.621	0.0	0.0
1909.1	1909	686.41	2436	683.21	223.80	1.40%	8	0.011	0.000	0.000	0.00	1.104	0.0	0.0
1910.1	1910	690.20	1909	686.41	157.60	2.40%	8	0.011	0.000	0.000	0.00	1.431	0.0	0.0
1911.1	1911	689.23	1914	669.06	466.80	4.30%	8	0.011	0.004	0.600	0.67	1.919	0.2	100.0
1912.1	1912	705.39	1911	689.23	459.80	3.50%	8	0.011	0.002	0.550	0.67	1.730	0.1	100.0
1913.1	1913	663.55	94	662.79	235.70	0.30%	8	0.011	0.000	0.000	0.00	0.524	0.0	0.0
1914.1	1914	669.06	1915	665.09	291.60	1.40%	8	0.011	0.006	0.610	0.41	1.077	0.6	61.4
1915.1	1915	665.09	1916	662.06	107.20	2.80%	8	0.011	0.017	0.910	0.06	1.552	1.1	8.4
1916.1	1916	662.06	1917	657.88	83.90	5.00%	8	0.011	0.018	0.870	0.05	2.060	0.8	7.0
1917.1	1917	657.88	1919	656.52	125.80	1.10%	8	0.011	0.022	1.020	0.07	0.960	2.2	10.7
1918.1	1918	672.19	1917	657.88	286.90	5.00%	8	0.011	0.002	0.570	0.67	2.061	0.1	100.0
1919.1	1919	656.52	95	646.34	48.80	20.90%	8	0.011	0.022	0.830	0.03	4.215	0.5	4.8
1920.1	1920	674.51	1915	665.09	270.20	3.50%	8	0.011	0.010	0.740	0.67	1.723	0.6	100.0
1921.1	1921	676.12	1926	675.45	114.40	0.60%	8	0.011	0.002	0.570	0.01	0.706	0.3	1.5

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1922.1	1922	693.26	1923	690.52	170.80	1.60%	8	0.011	0.002	0.540	0.00	1.169	0.1	0.7
1923.1	1923	690.52	1920	674.51	358.70	4.50%	8	0.011	0.005	0.630	0.67	1.950	0.3	100.0
1924.1	1924	691.50	1923	690.52	177.50	0.60%	8	0.011	0.003	0.630	0.02	0.686	0.4	3.1
1925.1	1925	692.35	1924	691.50	150.80	0.60%	8	0.011	0.002	0.610	0.02	0.693	0.3	2.9
1926.1	1926	675.45	1920	674.51	168.50	0.60%	8	0.011	0.003	0.620	0.02	0.690	0.4	3.0
1927.1	1927	650.30	1257	649.42	467.40	0.20%	27	0.011	0.564	2.080	0.41	10.264	5.5	18.4
1928.1	1928	638.15	840	636.26	478.50	0.40%	24	0.011	1.407	3.690	0.59	10.859	13.0	29.6
1929.1	1929	646.07	1928	638.15	547.90	1.40%	24	0.011	1.955	6.380	0.78	20.773	9.4	38.8
1930.1	1930	663.18	1931	658.71	383.40	1.20%	6	0.011	0.000	0.000	0.32	0.463	0.0	63.9
1931.1	1931	658.71	1932	655.07	364.50	1.00%	8	0.011	0.000	0.000	0.26	0.922	0.0	39.0
1932.1	1932	655.07	1933	654.21	152.90	0.60%	12	0.011	0.000	0.000	0.00	2.041	0.0	0.0
1933.1	1933	654.21	1934	652.09	423.00	0.50%	12	0.011	0.000	0.000	0.00	1.926	0.0	0.0
1934.1	1934	652.09	1935	650.74	271.00	0.50%	12	0.011	0.000	0.000	0.13	1.921	0.0	13.5
1935.1	1935	650.74	LS_LHS	649.00	296.80	0.60%	12	0.011	0.073	1.600	0.32	2.084	3.5	31.9
1936.1	1936	722.77	2166	719.74	289.70	1.00%	15	0.011	0.084	1.760	0.43	5.046	1.7	34.0
1937.1	1937	734.54	2165	731.30	298.00	1.10%	15	0.011	0.064	1.570	0.11	5.145	1.3	9.1
1938.1	1938	720.12	2166	719.74	27.80	1.40%	8	0.011	0.000	0.000	0.00	1.079	0.0	0.0
1939.1	1939	721.89	1938	720.12	60.60	2.90%	8	0.011	0.000	0.000	0.00	1.577	0.0	0.0
1940.1	1940	726.41	1941	724.46	109.10	1.80%	6	0.012	0.000	0.270	0.00	0.525	0.0	0.5
1941.1	1941	724.46	1942	721.39	174.80	1.80%	6	0.012	0.001	0.520	0.00	0.521	0.1	0.7
1942.1	1942	721.39	1943	714.46	253.10	2.70%	6	0.012	0.001	0.530	0.50	0.650	0.2	100.0
1943.1	1943	714.46	1944	704.45	198.20	5.10%	6	0.012	0.002	0.540	0.01	0.883	0.2	1.0
1944.1	1944	704.45	1945	702.86	169.70	0.90%	8	0.012	0.015	0.900	0.06	0.819	1.8	8.6
1945.1	1945	702.86	2437	701.89	144.80	0.70%	8	0.012	0.015	0.440	0.14	0.693	2.2	20.7
1946.1	1946	728.46	1947	722.86	218.00	2.60%	8	0.012	0.003	0.580	0.01	1.356	0.2	1.7
1947.1	1947	722.86	1948	717.53	198.10	2.70%	8	0.012	0.004	0.590	0.01	1.388	0.3	1.9
1948.1	1948	717.53	1949	713.74	117.50	3.20%	8	0.012	0.004	0.590	0.01	1.520	0.3	1.8
1949.1	1949	713.74	1950	708.62	123.20	4.20%	8	0.012	0.005	0.600	0.01	1.725	0.3	2.0
1950.1	1950	708.62	1944	704.45	275.90	1.50%	8	0.012	0.012	0.790	0.46	1.040	1.2	68.5
1951.1	1951	709.69	1950	708.62	207.50	0.50%	8	0.012	0.007	0.720	0.03	0.608	1.2	5.1
1952.1	1952	710.66	1951	709.69	172.60	0.60%	8	0.012	0.007	0.730	0.03	0.634	1.1	5.2
1953.1	1953	716.07	1952	710.66	296.10	1.80%	8	0.012	0.003	0.550	0.55	1.144	0.2	82.0
1954.1	1954	721.03	1953	716.07	177.60	2.80%	8	0.012	0.003	0.560	0.01	1.414	0.2	1.2
1955.1	1955	731.50	1956	730.50	182.70	0.50%	8	0.012	0.000	0.000	0.00	0.626	0.0	0.0
1956.1	1956	730.50	1957	728.80	318.10	0.50%	8	0.012	0.001	0.520	0.00	0.619	0.1	0.6
1957.1	1957	728.80	1954	721.03	419.90	1.90%	8	0.012	0.002	0.540	0.00	1.151	0.1	0.7
1958.1	1958	739.35	1956	730.50	291.00	3.00%	8	0.012	0.000	0.250	0.67	1.476	0.0	100.0
1959.1	1959	738.80	1963	729.71	450.40	2.00%	8	0.012	0.001	0.530	0.51	1.202	0.1	76.4
1960.1	1960	740.62	1959	738.80	172.70	1.10%	8	0.012	0.000	0.250	0.00	0.869	0.0	0.4
1961.1	1961	741.99	1959	738.80	123.40	2.60%	8	0.012	0.001	0.520	0.00	1.361	0.0	0.6

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1962.1	1962	739.67	1963	729.71	332.00	3.00%	8	0.012	0.001	0.520	0.00	1.466	0.0	0.5
1963.1	1963	729.71	1946	728.46	42.00	3.00%	8	0.012	0.003	0.570	0.01	1.460	0.2	1.4
1964.1	1964	721.50	1965	720.72	134.80	0.60%	8	0.012	0.000	0.250	0.00	0.644	0.0	0.4
1965.1	1965	720.72	1966	719.93	135.30	0.60%	8	0.012	0.001	0.530	0.00	0.647	0.1	0.6
1966.1	1966	719.93	1967	718.82	201.40	0.60%	8	0.012	0.001	0.530	0.00	0.628	0.2	0.7
1967.1	1967	718.82	1968	713.77	295.40	1.70%	8	0.012	0.002	0.540	0.51	1.106	0.1	76.5
1968.1	1968	713.77	1969	712.00	177.20	1.00%	8	0.012	0.002	0.560	0.01	0.846	0.3	1.3
1969.1	1969	712.00	1952	710.66	123.60	1.10%	8	0.012	0.003	0.570	0.01	0.881	0.3	1.4
1970.1	1970	657.88	2188	657.41	304.50	0.20%	18	0.015	0.641	1.750	0.54	2.312	27.7	35.8
1971.1	1971	696.03	334	695.20	75.00	1.10%	10	0.015	0.009	0.340	0.11	1.291	0.7	12.9
1972.1	1972	743.26	281	742.20	265.10	0.40%	8	0.013	0.020	0.740	0.23	0.494	4.1	33.8
1973.1	1973	758.49	292	757.41	55.30	2.00%	6	0.015	0.003	0.590	0.01	0.439	0.6	2.8
1974.1	1974	744.98	2212	742.10	206.00	1.40%	6	0.015	0.001	0.520	0.00	0.372	0.2	0.7
1975.1	1975	721.50	223	720.15	250.00	0.50%	6	0.015	0.004	0.730	0.18	0.231	1.7	35.2
1976.1	1976	771.00	1977	762.00	491.30	1.80%	8	0.012	0.000	0.250	0.50	1.145	0.0	75.4
1977.1	1977	762.00	1978	756.00	347.10	1.70%	8	0.012	0.002	0.540	0.00	1.112	0.1	0.7
1978.1	1978	756.00	1979	743.30	182.00	7.00%	8	0.012	0.002	0.560	0.01	2.235	0.1	1.2
1979.1	1979	743.30	2082	732.63	483.80	2.20%	8	0.012	0.006	0.650	0.61	1.257	0.5	92.0
1980.1	1980	727.50	2083	721.47	488.70	1.20%	8	0.012	0.009	0.730	0.37	0.940	1.0	55.1
1981.1	1981	735.13	2277	734.85	273.30	0.10%	10	0.013	0.121	0.980	0.35	0.453	26.8	41.4
1982.1	1982	738.59	1981	735.13	470.10	0.70%	10	0.013	0.121	1.980	0.38	1.215	10.0	46.1
1983.1	1983	809.88	1674	799.03	350.30	3.10%	8	0.012	0.000	0.520	0.67	1.489	0.0	100.0
1984.1	1984	631.31	1985	629.65	470.00	0.40%	24	0.011	2.353	4.070	0.75	10.269	22.9	37.4
1985.1	1985	629.65	1986	619.03	668.70	1.60%	24	0.011	2.353	7.000	0.85	21.775	10.8	42.7
1986.1	1986	619.03	1987	616.34	733.70	0.40%	24	0.011	2.267	4.100	0.63	10.462	21.7	31.7
1987.1	1987	616.34	2273	615.13	321.70	0.40%	30	0.011	3.077	4.410	0.68	19.212	16.0	27.2
1988.1	1988	617.90	1987	616.34	594.10	0.30%	18	0.011	0.915	2.840	0.56	4.111	22.3	37.2
1989.1	1989	620.57	1988	617.90	489.00	0.50%	18	0.011	0.916	3.700	0.55	5.929	15.4	36.8
1990.1	1990	637.51	1991	636.10	477.50	0.30%	18	0.011	0.679	2.710	0.49	4.360	15.6	32.4
1991.1	1991	636.10	754	635.46	460.10	0.10%	18	0.011	0.680	2.090	0.53	2.992	22.7	35.2
1992.1	1992	639.45	739	639.16	187.30	0.20%	18	0.011	0.672	2.250	0.46	3.157	21.3	30.7
1993.1	1993	612.10	1994	609.90	663.30	0.30%	30	0.011	3.010	4.190	0.78	18.042	16.7	31.1
1994.1	1994	609.90	1995	609.40	549.00	0.10%	30	0.011	3.054	2.700	0.99	9.455	32.3	39.6
1995.1	1995	609.40	1996	608.91	819.40	0.10%	30	0.011	3.075	2.540	1.02	7.661	40.1	40.6
1996.1	1996	608.91	1997	605.90	553.50	0.50%	30	0.011	3.062	5.030	0.75	23.102	13.3	30.2
1997.1	1997	605.90	1998	604.58	369.40	0.40%	30	0.011	3.048	4.320	0.78	18.727	16.3	31.2
1998.1	1998	604.58	2087	601.12	545.10	0.60%	30	0.011	3.093	5.330	0.60	24.961	12.4	23.9
1999.1	1999	683.87	2000	681.97	354.80	0.50%	8	0.011	0.020	1.040	0.23	0.675	3.0	34.5
2000.1	2000	681.97	2001	679.37	501.20	0.50%	8	0.011	0.021	1.060	0.09	0.665	3.1	14.2
2001.1	2001	679.37	2002	676.92	486.90	0.50%	8	0.011	0.021	1.030	0.23	0.655	3.2	35.0

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2002.1	2002	676.92	1805	675.01	283.80	0.70%	8	0.011	0.021	1.120	0.28	0.757	2.8	42.3
2003.1	2003	752.12	2422	750.65	403.00	0.40%	8	0.011	0.000	0.000	0.00	0.558	0.0	0.0
2004.1	2004	745.38	2421	745.15	244.70	0.10%	8	0.011	0.000	0.000	0.00	0.283	0.0	0.0
2005.1	2005	759.05	2426	754.21	158.80	3.00%	8	0.011	0.000	0.000	0.00	1.611	0.0	0.0
2006.1	2006	755.24	2426	754.21	130.10	0.80%	12	0.011	0.023	1.100	0.08	2.421	1.0	8.4
2007.1	2007	756.84	2006	755.24	282.30	0.60%	12	0.011	0.023	1.050	0.25	2.049	1.1	24.8
2008.1	2008	759.16	2007	756.84	129.80	1.80%	12	0.011	0.000	0.000	0.00	3.638	0.0	0.0
2009.1	2009	774.98	2138	770.56	216.40	2.00%	8	0.011	0.000	0.000	0.00	1.319	0.0	0.0
2010.1	2010	776.89	2122	774.82	393.70	0.50%	8	0.011	0.000	0.000	0.15	0.669	0.0	22.2
2011.1	2011	777.75	2010	776.89	50.50	1.70%	8	0.011	0.000	0.000	0.00	1.204	0.0	0.0
2012.1	2012	783.77	2010	776.89	451.90	1.50%	8	0.011	0.000	0.000	0.38	1.139	0.0	57.3
2013.1	2013	740.75	2014	740.22	130.80	0.40%	12	0.011	0.000	0.000	0.00	1.732	0.0	0.0
2014.1	2014	740.22	2143	738.24	269.80	0.70%	15	0.011	0.114	2.010	0.35	4.227	2.7	28.2
2015.1	2015	656.42	2189	655.46	312.90	0.30%	18	0.013	0.643	2.400	0.43	3.761	17.1	28.5
2016.1	2016	657.07	2015	656.42	189.80	0.30%	8	0.015	0.000	0.000	0.11	0.396	0.0	16.4
2017.1	2017	700.75	2141	700.28	404.90	0.10%	21	0.011	0.102	0.970	0.21	4.123	2.5	11.9
2018.1	2018	707.44	2334	706.83	101.80	0.60%	8	0.011	0.004	0.620	0.02	0.714	0.5	2.6
2019.1	2019	705.40	2020	704.74	163.90	0.40%	8	0.011	0.015	1.000	0.08	0.586	2.6	11.6
2020.1	2020	704.74	1472	701.78	232.50	1.30%	8	0.011	0.025	1.080	0.08	1.041	2.4	11.4
2021.1	2021	706.20	2019	705.40	206.00	0.40%	8	0.011	0.000	0.000	0.00	0.575	0.0	0.0
2022.1	2022	710.90	1332	707.50	100.50	3.40%	8	0.011	0.015	0.880	0.05	1.698	0.9	7.7
2023.1	2023	712.65	2022	710.90	106.20	1.60%	8	0.011	0.015	0.900	0.06	1.185	1.3	8.4
2024.1	2024	713.23	2022	710.90	222.80	1.00%	6	0.011	0.000	0.000	0.00	0.438	0.0	0.0
2025.1	2025	682.06	2026	680.18	234.70	0.80%	12	0.015	0.332	2.560	0.30	1.786	18.6	30.2
2026.1	2026	680.18	33	679.85	16.80	2.00%	12	0.015	0.332	3.530	0.24	2.797	11.9	24.0
2027.1	2027	660.23	2028	660.00	56.70	0.40%	12	0.015	0.285	2.080	0.32	1.271	22.4	31.5
2028.1	2028	659.90	234	658.45	338.50	0.40%	18	0.015	0.638	2.430	0.42	3.851	16.6	28.0
2029.1	2029	660.13	2028	659.90	106.80	0.20%	18	0.015	0.350	1.630	0.36	2.731	12.8	24.3
2030.1	2030	661.49	2029	660.13	628.60	0.20%	12	0.015	0.349	1.620	0.44	0.928	37.6	44.0
2031.1	2031	662.61	2030	661.49	558.40	0.20%	12	0.011	0.347	1.980	0.43	1.219	28.5	42.9
2032.1	2032	734.54	2033	733.68	253.40	0.30%	8	0.011	0.001	0.530	0.09	0.538	0.1	13.5
2033.1	2033	733.68	2034	732.66	270.20	0.40%	8	0.011	0.001	0.530	0.11	0.567	0.1	15.9
2034.1	2034	732.66	2035	731.48	318.30	0.40%	8	0.011	0.001	0.530	0.00	0.562	0.1	0.6
2035.1	2035	731.48	2036	730.03	427.90	0.30%	8	0.011	0.005	0.680	0.03	0.537	0.9	4.2
2036.1	2036	730.03	2037	728.85	318.60	0.40%	8	0.011	0.012	0.950	0.07	0.562	2.2	10.5
2037.1	2037	728.85	2038	728.34	205.90	0.20%	12	0.011	0.012	0.890	0.06	1.354	0.9	5.8
2038.1	2038	728.34	1336	726.74	300.00	0.50%	12	0.011	0.018	0.960	0.07	1.987	0.9	6.5
2039.1	2039	725.75	2040	724.19	429.80	0.40%	8	0.011	0.000	0.000	0.00	0.556	0.0	0.0
2040.1	2040	724.19	2041	723.17	269.80	0.40%	8	0.011	0.000	0.000	0.10	0.568	0.0	15.3
2041.1	2041	723.17	2042	722.25	240.10	0.40%	8	0.011	0.000	0.000	0.00	0.571	0.0	0.0

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2042.1	2042	722.25	2043	721.35	236.50	0.40%	8	0.011	0.000	0.000	0.00	0.569	0.0	0.0
2043.1	2043	721.35	1344	720.04	207.70	0.60%	8	0.011	0.000	0.000	0.00	0.733	0.0	0.0
2044.1	2044	734.31	2033	733.68	186.80	0.30%	8	0.011	0.000	0.000	0.00	0.536	0.0	0.0
2045.1	2045	767.14	2046	765.96	65.40	1.80%	6	0.012	0.003	0.590	0.01	0.528	0.5	2.7
2046.1	2046	765.96	2047	765.21	105.20	0.70%	8	0.012	0.003	0.590	0.01	0.715	0.4	2.0
2047.1	2047	765.21	2048	761.30	132.90	2.90%	8	0.012	0.004	0.590	0.01	1.451	0.3	1.8
2048.1	2048	761.30	1694	755.39	203.50	2.90%	8	0.012	0.005	0.630	0.02	1.442	0.4	2.7
2049.1	2049	650.40	2050	649.74	115.80	0.60%	8	0.011	0.000	0.380	0.00	0.697	0.0	0.4
2050.1	2050	649.74	2051	647.37	455.10	0.50%	10	0.011	0.001	0.530	0.14	1.208	0.1	16.3
2051.1	2051	647.37	2053	641.85	461.70	1.20%	10	0.011	0.003	0.600	0.32	1.830	0.2	38.5
2052.1	2052	644.08	2053	641.85	111.30	2.00%	8	0.011	0.000	0.190	0.00	1.307	0.0	0.4
2053.1	2053	641.85	2054	640.72	92.50	1.20%	10	0.011	0.007	0.680	0.03	1.850	0.4	3.0
2054.1	2054	640.72	1905	639.17	145.10	1.10%	10	0.011	0.008	0.690	0.03	1.730	0.4	3.1
2055.1	2055	628.50	648	627.36	198.70	0.60%	8	0.011	0.017	0.980	0.07	0.699	2.4	10.5
2056.1	2056	638.15	2055	628.50	213.90	4.50%	8	0.011	0.015	0.810	0.04	1.961	0.8	5.9
2057.1	2057	642.30	2056	638.15	449.00	0.90%	8	0.011	0.008	0.710	0.26	0.887	0.9	39.0
2058.1	2058	644.86	2057	642.30	313.60	0.80%	8	0.011	0.004	0.600	0.01	0.834	0.4	2.0
2059.1	2059	654.37	2058	644.86	339.60	2.80%	8	0.011	0.001	0.520	0.00	1.545	0.0	0.5
2060.1	2060	721.26	331	710.76	319.90	3.30%	6	0.015	0.042	1.400	0.11	0.569	7.4	22.9
2061.1	2061	714.40	767	713.64	194.30	0.40%	8	0.011	0.000	0.000	0.00	0.577	0.0	0.0
2062.1	2062	752.00	1617	748.20	357.30	1.10%	10	0.012	0.029	1.190	0.37	1.582	1.8	44.6
2063.1	2063	714.67	1143	713.50	252.90	0.50%	12	0.012	0.158	1.900	0.34	1.697	9.3	33.8
2064.1	2064	698.82	2065	696.94	298.30	0.60%	12	0.011	0.191	2.420	0.21	2.160	8.8	21.2
2065.1	2065	696.94	2066	695.16	285.90	0.60%	12	0.011	0.192	2.410	0.39	2.147	8.9	39.2
2066.1	2066	695.16	1021	694.63	45.30	1.20%	12	0.011	0.193	2.900	0.18	2.943	6.5	18.3
2067.1	2067	691.92	2069	690.90	453.50	0.20%	21	0.011	0.407	2.050	0.38	5.740	7.1	21.8
2068.1	2068	692.10	2067	691.92	87.60	0.20%	21	0.011	0.405	2.070	0.32	5.486	7.4	18.3
2069.1	2069	690.90	2070	685.20	491.70	1.20%	21	0.011	0.412	3.660	0.54	13.030	3.2	30.6
2070.1	2070	685.20	2081	681.40	502.00	0.80%	21	0.011	0.416	3.170	0.24	10.530	3.9	13.9
2071.1	2071	677.90	2072	676.90	160.00	0.60%	21	0.011	0.536	3.230	0.29	9.568	5.6	16.4
2072.1	2072	676.90	2073	674.98	224.40	0.90%	21	0.011	0.537	3.340	0.28	11.194	4.8	16.0
2073.1	2073	674.98	2074	674.68	216.10	0.10%	21	0.011	0.539	1.970	0.41	4.509	12.0	23.2
2074.1	2074	674.68	2075	674.17	437.00	0.10%	21	0.011	0.545	1.810	0.43	4.134	13.2	24.8
2075.1	2075	674.17	2076	672.85	156.90	0.80%	21	0.011	0.548	3.620	0.27	11.100	4.9	15.4
2076.1	2076	672.85	2077	669.49	503.40	0.70%	21	0.011	0.551	3.330	0.29	9.888	5.6	16.4
2077.1	2077	669.49	938	668.45	385.10	0.30%	21	0.011	0.558	2.430	0.43	6.290	8.9	24.8
2078.1	2078	666.37	2079	665.73	350.70	0.20%	21	0.011	0.728	2.300	0.50	5.170	14.1	28.3
2079.1	2079	665.73	2080	665.56	45.00	0.40%	21	0.011	0.732	2.930	0.38	7.439	9.8	21.7
2080.1	2080	665.56	433	661.23	188.80	2.30%	21	0.011	0.746	5.690	0.24	18.327	4.1	13.9
2081.1	2081	681.40	1559	678.43	68.30	4.40%	21	0.011	0.417	4.520	0.16	25.242	1.7	9.1

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Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2082.1	2082	732.63	1980	727.50	283.10	1.80%	8	0.012	0.007	0.660	0.54	1.139	0.6	80.3
2083.1	2083	721.47	1143	713.50	193.90	4.10%	8	0.012	0.009	0.700	0.03	1.715	0.5	3.8
2084.1	2084	731.22	1980	727.50	301.20	1.20%	8	0.012	0.000	0.520	0.00	0.940	0.0	0.5
2085.1	2085	597.00	2090	594.75	517.00	0.40%	30	0.011	3.244	4.720	0.67	20.666	15.7	26.9
2086.1	2086	597.70	2085	597.00	435.70	0.20%	30	0.011	3.187	3.380	0.84	12.557	25.4	33.7
2087.1	2087	601.12	2088	600.68	267.10	0.20%	30	0.011	3.118	3.410	0.87	12.714	24.5	34.8
2088.1	2088	600.68	2196	600.32	300.70	0.10%	30	0.011	3.119	3.100	0.89	10.841	28.8	35.5
2089.1	2089	600.00	2086	597.70	790.30	0.30%	30	0.011	3.186	4.070	0.81	16.900	18.8	32.6
2090.1	2090	594.75	2091	593.90	628.40	0.10%	30	0.011	3.227	3.180	0.89	11.522	28.0	35.6
2091.1	2091	593.90	2092	592.83	590.60	0.20%	30	0.011	3.438	3.540	0.91	13.335	25.8	36.5
2092.1	2092	592.83	2093	591.90	217.00	0.40%	30	0.011	3.422	4.730	0.70	20.512	16.7	27.9
2093.1	2093	591.90	2094	589.53	449.60	0.50%	30	0.011	3.420	5.140	0.79	22.747	15.0	31.6
2094.1	2094	589.53	2095	589.23	378.70	0.10%	30	0.011	3.414	3.010	0.99	8.817	38.7	39.6
2095.1	2095	589.23	2096	588.30	225.10	0.40%	30	0.011	3.410	4.160	0.76	20.137	16.9	30.5
2096.1	2096	588.30	O-3	588.30	359.60	0.00%	30	0.011	3.406	2.600	1.08	0.000	Infinity	43.2
2097.1	2097	614.46	1993	612.10	624.20	0.40%	30	0.011	3.007	4.400	0.67	19.264	15.6	26.8
2098.1	2098	661.00	W-1	658.00	39.80	7.50%	12	0.011	0.046	0.670	0.19	7.474	0.6	19.2
2099.1	2099	661.49	2098	661.00	195.00	0.30%	12	0.011	0.047	0.960	0.15	1.364	3.5	15.3
2101.1	2101	703.55	2102	701.73	183.00	1.00%	8	0.011	0.001	0.530	0.00	0.920	0.1	0.6
2102.1	2102	701.73	2103	699.67	195.50	1.10%	8	0.011	0.001	0.540	0.00	0.948	0.2	0.7
2103.1	2103	699.67	1792	697.62	191.30	1.10%	8	0.011	0.002	0.550	0.01	0.956	0.2	1.0
2104.1	2104	702.92	2105	699.89	292.60	1.00%	8	0.011	0.000	0.000	0.30	0.939	0.0	45.5
2105.1	2105	699.89	2108	698.64	115.40	1.10%	8	0.011	0.000	0.000	0.00	0.961	0.0	0.0
2106.1	2106	708.65	2105	699.89	346.90	2.50%	8	0.011	0.000	0.000	0.00	1.467	0.0	0.0
2107.1	2107	697.19	1788	695.37	175.30	1.00%	8	0.011	0.011	0.770	0.04	0.940	1.1	5.5
2108.1	2108	698.64	2107	697.19	130.90	1.10%	8	0.011	0.008	0.690	0.03	0.971	0.8	3.8
2109.1	2109	707.18	240	704.75	404.20	0.60%	6	0.015	0.000	0.000	0.00	0.244	0.0	0.0
2110.1	2110	739.45	1982	738.59	300.70	0.30%	10	0.013	0.044	0.860	0.17	0.757	5.7	20.1
2111.1	2111	746.57	284	746.03	88.30	0.60%	6	0.015	0.017	0.960	0.10	0.246	6.9	19.6
2112.1	2112	743.88	1972	743.26	155.10	0.40%	8	0.013	0.001	0.520	0.00	0.494	0.1	0.5
2113.1	2113	746.78	288	744.26	146.20	1.70%	8	0.013	0.000	0.430	0.00	1.025	0.0	0.5
2114.1	2114	705.89	195	704.50	134.30	1.00%	12	0.015	0.264	2.610	0.25	2.030	13.0	25.4
2115.1	2115	750.23	2116	748.02	422.90	0.50%	6	0.013	0.000	0.000	0.00	0.262	0.0	0.0
2116.1	2116	748.02	285	747.83	108.20	0.20%	6	0.013	0.000	0.000	0.03	0.152	0.0	6.5
2117.1	2117	726.18	2063	714.67	365.40	3.20%	12	0.012	0.084	1.740	0.94	4.428	1.9	94.1
2118.1	2118	763.62	2119	762.71	109.00	0.80%	8	0.011	0.000	0.000	0.00	0.843	0.0	0.0
2119.1	2119	762.71	2120	762.20	52.70	1.00%	8	0.011	0.000	0.000	0.00	0.908	0.0	0.0
2120.1	2120	762.20	2121	759.60	335.20	0.80%	8	0.011	0.000	0.000	0.00	0.813	0.0	0.0
2121.1	2121	759.60	2008	759.16	20.60	2.10%	8	0.011	0.000	0.000	0.00	1.348	0.0	0.0
2122.1	2122	774.82	2134	766.10	356.20	2.40%	8	0.011	0.000	0.000	0.62	1.444	0.0	93.4

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2123.1	2123	756.79	1633	756.40	195.50	0.20%	10	0.012	0.017	0.790	0.09	0.685	2.4	10.9
2124.1	2124	705.59	346	698.52	663.10	1.10%	8	0.015	0.102	1.910	0.46	0.699	14.5	69.3
2125.1	2125	697.05	344	696.05	359.50	0.30%	10	0.015	0.165	1.400	0.38	0.647	25.5	45.4
2126.1	2126	685.86	458	680.85	222.00	2.30%	8	0.011	0.059	1.500	0.11	1.387	4.3	16.2
2127.1	2127	680.27	2130	676.42	526.90	0.70%	8	0.011	0.058	1.620	0.14	0.789	7.4	21.6
2128.1	2128	670.45	453	666.79	821.80	0.40%	10	0.011	0.077	1.520	0.17	1.117	6.9	20.2
2129.1	2129	672.15	2128	670.45	443.90	0.40%	8	0.011	0.056	1.260	0.17	0.571	9.8	25.0
2130.1	2130	676.42	2435	673.69	366.10	0.70%	8	0.011	0.057	1.630	0.34	0.797	7.2	50.6
2131.1	2131	687.77	2126	685.86	557.00	0.30%	8	0.011	0.012	0.930	0.15	0.541	2.3	22.9
2132.1	2132	740.22	209	738.99	332.70	0.40%	8	0.015	0.002	0.560	0.03	0.412	0.6	5.0
2133.1	2133	764.56	2008	759.16	253.30	2.10%	8	0.011	0.000	0.000	0.54	1.348	0.0	81.0
2134.1	2134	766.10	2133	764.56	253.30	0.60%	8	0.011	0.000	0.000	0.15	0.720	0.0	23.1
2135.1	2135	775.60	2122	774.82	121.60	0.60%	8	0.011	0.000	0.000	0.00	0.739	0.0	0.0
2136.1	2136	766.82	2134	766.10	123.90	0.60%	8	0.011	0.000	0.000	0.00	0.704	0.0	0.0
2137.1	2137	751.35	2423	748.76	334.10	0.80%	8	0.011	0.000	0.000	0.00	0.813	0.0	0.0
2138.1	2138	770.56	2134	766.10	217.90	2.00%	8	0.011	0.000	0.000	0.00	1.321	0.0	0.0
2139.1	2139	699.00	1017	697.90	416.30	0.30%	21	0.011	0.101	1.290	0.17	6.221	1.6	9.7
2140.1	2140	699.04	2139	699.00	492.40	0.00%	21	0.011	0.101	0.560	0.31	1.091	9.3	17.4
2141.1	2141	700.28	2140	699.04	492.70	0.30%	21	0.011	0.102	1.270	0.24	6.071	1.7	13.8
2142.1	2142	736.39	1937	734.54	251.70	0.70%	15	0.011	0.074	1.710	0.31	4.230	1.7	25.1
2143.1	2143	738.24	2142	736.39	248.10	0.70%	15	0.011	0.089	1.840	0.32	4.261	2.1	25.9
2144.1	2144	741.20	2014	740.22	447.30	0.20%	15	0.011	0.175	1.610	0.24	2.310	7.6	19.5
2145.1	2145	742.17	2144	741.20	431.50	0.20%	15	0.011	0.251	1.830	0.29	2.339	10.7	22.9
2146.1	2146	743.25	2145	742.17	490.40	0.20%	15	0.011	0.256	1.800	0.35	2.315	11.1	28.3
2147.1	2147	743.97	2146	743.25	311.20	0.20%	15	0.011	0.222	1.740	0.27	2.373	9.4	21.8
2148.1	2148	745.05	2147	743.97	484.60	0.20%	15	0.011	0.170	1.550	0.31	2.329	7.3	24.4
2149.1	2149	745.49	2148	745.05	179.30	0.20%	15	0.011	0.134	1.460	0.22	2.444	5.5	17.2
2150.1	2150	745.79	2149	745.49	161.00	0.20%	15	0.011	0.115	1.250	0.22	2.130	5.4	17.4
2151.1	2151	755.88	2150	745.79	220.60	4.60%	8	0.011	0.060	1.440	0.09	1.974	3.1	14.0
2152.1	2152	761.61	2151	755.88	285.30	2.00%	8	0.011	0.053	1.450	0.67	1.308	4.0	100.0
2153.1	2153	765.73	2152	761.61	335.00	1.20%	8	0.011	0.036	1.320	0.11	1.024	3.5	16.3
2154.1	2154	771.84	1749	771.22	154.60	0.40%	8	0.011	0.010	0.830	0.05	0.584	1.7	7.7
2155.1	2155	772.33	2154	771.84	54.10	0.90%	8	0.011	0.010	0.760	0.04	0.879	1.1	5.6
2156.1	2156	772.90	2155	772.33	141.80	0.40%	8	0.011	0.010	0.830	0.05	0.585	1.7	7.7
2157.1	2157	697.00	2159	694.53	290.20	0.90%	12	0.011	0.034	1.250	0.35	2.511	1.4	34.9
2158.1	2158	693.28	2068	692.10	126.80	0.90%	21	0.011	0.404	3.380	0.23	11.677	3.5	13.0
2159.1	2159	694.53	2158	693.28	81.50	1.50%	12	0.011	0.034	1.210	0.09	3.370	1.0	8.9
2160.1	2160	699.48	2157	697.00	296.50	0.80%	12	0.011	0.034	1.240	0.35	2.489	1.4	35.0
2161.1	2161	706.12	1150	703.60	295.80	0.90%	8	0.011	0.015	0.920	0.31	0.852	1.7	46.9
2162.1	2162	707.40	2161	706.12	156.10	0.80%	8	0.011	0.014	0.890	0.05	0.836	1.7	8.2

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2163.1	2163	773.86	2156	772.90	109.60	0.90%	8	0.011	0.010	0.760	0.04	0.864	1.1	5.5
2164.1	2164	778.29	2163	773.86	144.70	3.10%	8	0.011	0.010	0.730	0.03	1.615	0.6	4.8
2165.1	2165	731.30	1936	722.77	488.80	1.70%	15	0.011	0.061	1.470	0.57	6.518	0.9	45.9
2166.1	2166	719.74	2167	716.21	318.90	1.10%	15	0.011	0.083	1.740	0.12	5.191	1.6	9.6
2167.1	2167	716.21	2168	711.92	416.30	1.00%	15	0.011	0.083	1.780	0.13	5.009	1.7	10.2
2168.1	2168	711.92	2169	709.54	477.80	0.50%	15	0.011	0.082	1.550	0.28	3.482	2.4	22.5
2169.1	2169	709.54	2170	706.82	360.60	0.80%	15	0.011	0.090	1.850	0.33	4.285	2.1	26.8
2170.1	2170	706.82	2171	703.98	415.50	0.70%	15	0.011	0.090	1.790	0.14	4.079	2.2	11.5
2171.1	2171	703.98	2017	700.75	402.80	0.80%	15	0.011	0.090	1.880	0.14	4.418	2.0	11.0
2172.1	2172	769.00	1289	764.00	274.70	1.80%	8	0.012	0.006	0.650	0.52	1.142	0.5	77.9
2173.1	2173	777.00	1301	776.00	186.20	0.50%	8	0.012	0.000	0.000	0.00	0.620	0.0	0.0
2174.1	2174	728.00	1295	718.18	288.90	3.40%	8	0.012	0.039	1.260	0.67	1.560	2.5	100.0
2175.1	2175	627.83	2177	624.29	131.90	2.70%	8	0.011	0.026	1.060	0.07	1.512	1.7	10.7
2176.1	2176	628.88	2175	627.83	194.40	0.50%	8	0.011	0.002	0.540	0.00	0.678	0.2	0.7
2177.1	2177	624.29	661	617.24	176.00	4.00%	8	0.011	0.026	1.040	0.07	1.847	1.4	10.3
2178.1	2178	636.44	2175	627.83	276.30	3.10%	8	0.011	0.003	0.580	0.67	1.629	0.2	100.0
2179.1	2179	640.22	2178	636.44	305.70	1.20%	8	0.011	0.000	0.520	0.00	1.026	0.0	0.5
2180.1	2180	648.03	2181	626.62	473.80	4.50%	8	0.011	0.000	0.520	0.67	1.962	0.0	100.0
2181.1	2181	626.62	2183	620.30	425.90	1.50%	8	0.011	0.006	0.630	0.02	1.124	0.5	2.4
2182.1	2182	627.50	2181	626.62	156.00	0.60%	8	0.011	0.000	0.520	0.00	0.693	0.1	0.5
2183.1	2183	620.30	660	617.81	449.10	0.60%	8	0.011	0.006	0.680	0.16	0.687	0.9	24.7
2184.1	2184	620.17	655	615.96	408.90	1.00%	15	0.011	0.000	0.000	0.00	5.006	0.0	0.0
2185.1	2185	621.60	647	620.79	181.80	0.40%	8	0.011	0.001	0.520	0.00	0.616	0.1	0.5
2186.1	2186	657.16	235	657.00	52.10	0.30%	18	0.015	0.641	2.380	0.43	3.262	19.6	28.5
2187.1	2187	659.32	237	659.02	101.20	0.30%	8	0.015	0.000	0.000	0.00	0.369	0.0	0.0
2188.1	2188	657.41	2186	657.16	121.40	0.20%	18	0.015	0.641	2.030	0.48	2.670	24.0	32.0
2189.1	2189	655.46	2190	655.15	84.90	0.40%	18	0.015	0.642	2.380	0.43	3.555	18.1	28.6
2190.1	2190	655.15	2191	654.84	91.40	0.30%	18	0.015	0.642	2.330	0.44	3.427	18.7	29.1
2191.1	2191	654.84	1282	653.40	492.00	0.30%	18	0.011	0.642	2.660	0.48	4.340	14.8	31.8
2192.1	2192	652.02	710	651.84	79.20	0.20%	18	0.011	0.651	2.580	0.41	3.825	17.0	27.3
2193.1	2193	641.20	1992	639.45	588.30	0.30%	18	0.011	0.670	2.710	0.48	4.376	15.3	32.2
2194.1	2194	777.92	1581	777.02	236.10	0.40%	8	0.012	0.003	0.590	0.01	0.522	0.6	1.8
2195.1	2195	610.09	2196	600.32	162.20	6.00%	8	0.011	0.070	1.470	0.09	2.265	3.1	12.8
2196.1	2196	600.32	2089	600.00	354.70	0.10%	30	0.011	3.180	3.010	0.94	9.410	33.8	37.6
2198.1	2198	736.11	2199	728.36	291.20	2.70%	6	0.015	0.004	0.660	0.50	0.513	0.8	100.0
2199.1	2199	728.36	248	724.50	141.00	2.70%	6	0.015	0.005	0.630	0.02	0.520	0.9	3.8
2200.1	2200	695.60	1544	693.43	413.00	0.50%	12	0.011	0.058	1.350	0.14	1.973	2.9	13.9
2201.1	2201	697.76	2200	695.60	413.00	0.50%	12	0.011	0.028	0.930	0.11	1.968	1.4	11.0
2202.1	2202	710.71	1539	708.62	368.60	0.60%	8	0.011	0.010	0.830	0.20	0.695	1.5	30.0
2203.1	2203	716.12	1538	712.50	112.80	3.20%	8	0.011	0.007	0.640	0.02	1.653	0.4	2.6

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2204.1	2204	667.73	2205	667.20	5.70	9.20%	15	0.011	0.070	1.390	0.07	14.995	0.5	5.6
2205.1	2205	667.20	27	665.80	498.30	0.30%	24	0.011	0.098	1.270	0.16	9.159	1.1	8.0
2206.1	2206	761.77	293	758.48	637.90	0.50%	6	0.013	0.005	0.700	0.03	0.260	2.0	6.4
2207.1	2207	812.00	2208	808.32	163.10	2.30%	8	0.011	0.001	0.520	0.00	1.386	0.0	0.6
2208.1	2208	808.32	2209	807.50	151.10	0.50%	8	0.011	0.001	0.530	0.00	0.680	0.2	0.7
2209.1	2209	807.50	2210	806.50	116.70	0.90%	8	0.011	0.002	0.540	0.00	0.855	0.2	0.7
2210.1	2210	806.50	1584	803.68	214.80	1.30%	8	0.011	0.002	0.540	0.00	1.058	0.1	0.7
2211.1	2211	743.87	2212	742.10	127.90	1.40%	8	0.013	0.000	0.450	0.00	0.919	0.0	0.5
2212.1	2212	742.10	265	739.11	284.50	1.10%	6	0.015	0.002	0.610	0.32	0.322	0.6	63.5
2213.1	2213	715.14	2214	714.90	89.70	0.30%	8	0.011	0.017	0.830	0.10	0.478	3.5	14.4
2214.1	2214	714.90	2215	695.38	450.60	4.30%	8	0.011	0.017	0.820	0.67	1.921	0.9	100.0
2215.1	2215	695.38	2441	682.31	368.30	3.50%	8	0.011	0.020	0.960	0.67	1.739	1.2	100.0
2216.1	2216	682.41	2441	682.31	102.50	0.10%	8	0.011	0.005	0.750	0.04	0.288	1.8	6.2
2217.1	2217	695.97	2215	695.38	97.90	0.60%	8	0.011	0.004	0.640	0.02	0.717	0.5	3.4
2218.1	2218	676.39	473	675.32	286.70	0.40%	8	0.012	0.025	0.800	0.24	0.517	4.9	35.8
2219.1	2219	676.67	2218	676.39	36.20	0.80%	8	0.011	0.025	1.170	0.09	0.812	3.1	14.2
2220.1	2220	677.47	2219	676.67	158.70	0.50%	8	0.011	0.025	1.020	0.11	0.655	3.9	16.7
2221.1	2221	779.30	2222	774.16	84.40	6.10%	8	0.011	0.000	0.200	0.00	2.278	0.0	0.4
2222.1	2222	774.16	2223	766.59	294.30	2.60%	8	0.011	0.000	0.520	0.67	1.480	0.0	100.0
2223.1	2223	766.59	2224	758.10	172.70	4.90%	8	0.011	0.002	0.550	0.01	2.046	0.1	1.1
2224.1	2224	758.10	2225	757.62	145.30	0.30%	8	0.011	0.002	0.590	0.01	0.531	0.5	2.1
2225.1	2225	757.62	2228	752.20	306.80	1.80%	8	0.011	0.004	0.590	0.01	1.227	0.3	1.7
2226.1	2226	778.00	2233	772.52	140.00	3.90%	8	0.011	0.000	0.200	0.00	1.826	0.0	0.4
2227.1	2227	762.52	2225	757.62	255.80	1.90%	8	0.011	0.000	0.390	0.49	1.278	0.0	73.9
2228.1	2228	752.20	2230	750.26	176.90	1.10%	8	0.011	0.013	0.930	0.07	0.967	1.4	9.9
2229.1	2229	750.26	2231	748.87	257.00	0.50%	8	0.011	0.013	0.900	0.20	0.679	1.9	29.8
2230.1	2230	750.26	2229	750.26	86.80	0.00%	8	0.011	0.013	0.280	0.17	0.000	Infinity	26.0
2231.1	2231	748.87	2232	747.16	66.00	2.60%	8	0.011	0.013	0.840	0.05	1.486	0.9	7.1
2232.1	2232	747.16	2150	745.79	427.90	0.30%	12	0.011	0.013	0.920	0.06	1.540	0.9	6.4
2233.1	2233	772.52	2223	766.59	70.40	8.40%	8	0.011	0.001	0.520	0.00	2.678	0.0	0.6
2235.1	2235	765.98	2236	764.79	123.80	1.00%	8	0.011	0.000	0.520	0.00	0.905	0.0	0.5
2236.1	2236	764.79	2237	754.66	503.80	2.00%	8	0.011	0.001	0.530	0.00	1.309	0.1	0.7
2237.1	2237	754.66	2228	752.20	467.60	0.50%	8	0.011	0.005	0.670	0.16	0.669	0.7	24.4
2238.1	2238	763.01	2228	752.20	289.40	3.70%	8	0.011	0.000	0.200	0.67	1.784	0.0	100.0
2239.1	2239	655.93	2240	642.57	379.10	3.50%	8	0.011	0.001	0.520	0.67	1.733	0.0	100.0
2240.1	2240	642.57	2244	636.28	256.90	2.40%	8	0.011	0.003	0.600	0.64	1.444	0.2	96.6
2241.1	2241	648.08	2242	636.41	371.80	3.10%	8	0.011	0.001	0.530	0.67	1.635	0.1	100.0
2242.1	2242	636.41	105	633.04	328.70	1.00%	8	0.011	0.006	0.650	0.02	0.935	0.7	3.0
2243.1	2243	626.18	101	620.83	411.60	1.30%	8	0.011	0.008	0.670	0.02	1.052	0.8	3.4
2244.1	2244	636.28	2243	626.18	500.00	2.00%	8	0.011	0.005	0.600	0.01	1.312	0.3	1.8

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2245.1	2245	698.00	2247	696.72	245.30	0.50%	8	0.011	0.004	0.660	0.03	0.667	0.6	3.9
2246.1	2246	701.30	2245	698.00	403.80	0.80%	8	0.011	0.001	0.530	0.00	0.834	0.1	0.7
2247.1	2247	696.72	2255	695.45	295.10	0.40%	8	0.011	0.006	0.740	0.17	0.606	1.0	24.8
2248.1	2248	697.40	2247	696.72	150.10	0.50%	8	0.011	0.000	0.000	0.00	0.621	0.0	0.0
2249.1	2249	700.96	2250	698.52	286.80	0.90%	8	0.011	0.001	0.530	0.25	0.851	0.1	37.3
2250.1	2250	698.52	2255	695.45	377.20	0.80%	8	0.011	0.003	0.580	0.23	0.833	0.4	34.6
2251.1	2251	692.72	2256	691.60	341.90	0.30%	10	0.011	0.018	1.020	0.08	0.958	1.8	9.6
2252.1	2252	693.77	2251	692.72	320.20	0.30%	10	0.011	0.000	0.000	0.00	0.958	0.0	0.0
2253.1	2253	690.11	2254	688.56	489.60	0.30%	10	0.011	0.033	0.880	0.22	0.942	3.5	26.5
2254.1	2254	688.56	560	688.08	129.20	0.40%	10	0.011	0.037	0.990	0.13	1.020	3.6	16.2
2255.1	2255	695.45	2251	692.72	261.30	1.00%	8	0.011	0.013	0.840	0.32	0.943	1.4	48.2
2256.1	2256	691.60	2253	690.11	469.90	0.30%	10	0.011	0.030	0.890	0.21	0.942	3.2	25.1
2257.1	2257	690.30	2268	677.00	231.10	5.80%	8	0.011	0.001	0.530	0.00	2.214	0.0	0.7
2258.1	2258	669.27	2265	668.50	134.80	0.60%	8	0.011	0.068	1.610	0.16	0.698	9.8	24.4
2259.1	2259	695.85	2260	678.37	325.60	5.40%	8	0.011	0.001	0.530	0.00	2.138	0.0	0.6
2260.1	2260	678.37	2261	673.96	104.00	4.20%	8	0.011	0.002	0.560	0.01	1.901	0.1	1.3
2261.1	2261	673.96	2262	670.58	105.90	3.20%	8	0.011	0.003	0.570	0.01	1.649	0.2	1.3
2262.1	2262	670.58	2258	669.27	235.80	0.60%	8	0.011	0.064	1.520	0.16	0.688	9.4	24.2
2263.1	2263	673.00	2264	670.40	83.60	3.10%	8	0.011	0.001	0.520	0.00	1.627	0.0	0.5
2264.1	2264	670.40	2262	670.58	286.80	-0.10%	8	0.011	0.062	0.450	0.38	0.231	27.0	56.5
2265.1	2265	668.50	2266	667.55	171.40	0.60%	8	0.011	0.069	1.570	0.17	0.687	10.0	24.8
2266.1	2266	667.55	2267	667.40	8.50	1.80%	8	0.011	0.069	1.650	0.12	1.223	5.6	18.5
2267.1	2267	667.40	2269	664.65	477.90	0.60%	8	0.011	0.069	1.620	0.32	0.700	9.9	47.4
2268.1	2268	677.00	2258	669.27	200.30	3.90%	8	0.011	0.003	0.560	0.01	1.813	0.1	1.3
2269.1	2269	664.65	2270	656.15	494.10	1.70%	8	0.011	0.076	1.740	0.60	1.211	6.3	90.3
2270.1	2270	656.15	2271	649.76	490.20	1.30%	8	0.011	0.084	1.870	0.50	1.054	8.0	74.8
2271.1	2271	649.76	2272	649.24	126.90	0.40%	8	0.011	0.091	1.620	0.20	0.591	15.3	29.6
2272.1	2272	649.24	1839	647.53	443.50	0.40%	8	0.011	0.092	1.590	0.20	0.573	16.1	30.4
2273.1	2273	615.13	2097	614.46	178.10	0.40%	30	0.011	3.042	4.350	0.68	19.217	15.8	27.2
2274.1	2274	632.80	1989	631.59	409.00	0.30%	18	0.011	0.916	6.130	0.28	4.364	21.0	18.8
2275.1	2275	633.79	854	631.31	437.00	0.60%	24	0.011	2.122	4.670	0.55	13.016	16.3	27.5
2276.1	2276	725.78	2443	724.26	301.60	0.50%	6	0.015	0.000	0.000	0.00	0.223	0.0	0.0
2277.1	2277	734.85	161	734.74	6.80	1.60%	10	0.013	0.121	1.600	0.22	1.802	6.7	26.7
2278.1	2278	698.32	2279	696.04	219.70	1.00%	8	0.013	0.000	0.000	0.00	0.796	0.0	0.0
2279.1	2279	696.04	1426	695.49	47.00	1.20%	8	0.013	0.000	0.000	0.00	0.845	0.0	0.0
2280.1	2280	792.22	2281	790.81	262.50	0.50%	8	0.011	0.000	0.190	0.14	0.676	0.0	21.5
2281.1	2281	790.81	2282	771.15	447.80	4.40%	8	0.011	0.001	0.520	0.67	1.934	0.0	100.0
2282.1	2282	771.15	903	770.31	381.90	0.20%	8	0.011	0.003	0.650	0.09	0.433	0.8	12.8
2283.1	2283	771.55	2282	771.15	308.70	0.10%	8	0.011	0.001	0.530	0.00	0.332	0.4	0.7
2284.1	2284	791.60	2289	778.50	303.30	4.30%	8	0.011	0.000	0.250	0.00	1.918	0.0	0.4

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2285.1	2285	770.85	2286	763.90	299.30	2.30%	8	0.011	0.009	0.690	0.03	1.406	0.6	3.8
2286.1	2286	763.90	2287	757.55	284.70	2.20%	8	0.011	0.009	0.700	0.66	1.378	0.6	99.1
2287.1	2287	757.55	2288	757.13	62.50	0.70%	8	0.011	0.009	0.760	0.04	0.757	1.2	5.8
2288.1	2288	757.13	2373	754.67	425.50	0.60%	8	0.011	0.009	0.770	0.04	0.702	1.2	6.1
2289.1	2289	778.50	2283	771.55	129.90	5.30%	8	0.011	0.001	0.530	0.00	2.135	0.0	0.6
2290.1	2290	613.00	2291	610.76	57.30	3.90%	8	0.011	0.003	0.580	0.01	1.824	0.2	1.6
2291.1	2291	610.76	1431	605.90	315.00	1.50%	8	0.011	0.010	0.750	0.03	1.146	0.9	5.2
2292.1	2292	621.00	2291	610.76	413.60	2.50%	8	0.011	0.003	0.560	0.01	1.452	0.2	1.2
2293.1	2293	658.42	2294	656.25	204.10	1.10%	8	0.011	0.002	0.540	0.00	0.952	0.2	0.7
2294.1	2294	656.25	2295	655.13	203.80	0.50%	8	0.011	0.003	0.620	0.02	0.684	0.4	3.1
2295.1	2295	655.13	2296	650.77	326.60	1.30%	8	0.011	0.003	0.560	0.01	1.066	0.3	0.9
2296.1	2296	650.77	2299	648.11	308.60	0.90%	8	0.011	0.006	0.660	0.02	0.857	0.7	3.5
2297.1	2297	651.79	2296	650.77	91.90	1.10%	8	0.011	0.001	0.530	0.00	0.973	0.1	0.6
2298.1	2298	654.28	2297	651.79	96.80	2.60%	8	0.011	0.000	0.520	0.00	1.480	0.0	0.5
2299.1	2299	648.11	2303	642.03	368.70	1.60%	8	0.011	0.008	0.740	0.47	1.185	0.7	70.4
2300.1	2300	654.72	2301	653.84	62.70	1.40%	8	0.011	0.000	0.380	0.00	1.093	0.0	0.5
2301.1	2301	653.84	2302	647.64	452.10	1.40%	8	0.011	0.001	0.520	0.35	1.081	0.1	52.2
2302.1	2302	647.64	2303	642.03	299.40	1.90%	8	0.011	0.003	0.590	0.01	1.264	0.2	2.0
2303.1	2303	642.03	2304	640.87	213.50	0.50%	8	0.011	0.014	0.950	0.07	0.680	2.1	10.2
2304.1	2304	640.87	2305	639.78	197.00	0.60%	8	0.011	0.015	0.970	0.07	0.687	2.2	10.5
2305.1	2305	639.78	2306	638.92	153.60	0.60%	8	0.011	0.017	1.020	0.08	0.691	2.4	11.8
2306.1	2306	638.92	2175	627.83	224.40	4.90%	8	0.011	0.018	0.850	0.04	2.052	0.9	6.4
2307.1	2307	656.54	2308	649.67	141.10	4.90%	8	0.011	0.001	0.530	0.00	2.037	0.1	0.7
2308.1	2308	649.67	2057	642.30	191.20	3.90%	8	0.011	0.002	0.560	0.01	1.812	0.1	1.2
2309.1	2309	650.35	2310	648.44	179.90	1.10%	8	0.011	0.001	0.520	0.00	0.951	0.1	0.6
2310.1	2310	648.44	2056	638.15	321.00	3.20%	8	0.011	0.003	0.590	0.01	1.653	0.2	1.9
2311.1	2311	655.07	2310	648.44	166.10	4.00%	8	0.011	0.001	0.530	0.00	1.844	0.1	0.7
2312.1	2312	616.62	2313	615.37	330.00	0.40%	8	0.011	0.005	0.700	0.03	0.568	0.8	5.1
2313.1	2313	615.37	2314	614.04	349.40	0.40%	8	0.011	0.009	0.800	0.14	0.569	1.6	21.3
2314.1	2314	614.04	2315	612.68	358.50	0.40%	8	0.011	0.013	0.940	0.16	0.569	2.3	24.6
2315.1	2315	612.68	2316	611.57	291.00	0.40%	8	0.011	0.018	0.980	0.20	0.570	3.1	29.9
2316.1	2316	611.57	2317	606.69	353.80	1.40%	10	0.011	0.020	1.010	0.42	1.965	1.0	50.4
2317.1	2317	606.69	2318	605.08	103.80	1.60%	10	0.011	0.023	1.070	0.08	2.084	1.1	9.3
2318.1	2318	605.08	2087	601.12	433.90	0.90%	10	0.011	0.036	1.310	0.11	1.599	2.3	12.7
2319.1	2319	609.08	2320	607.58	399.80	0.40%	8	0.011	0.001	0.530	0.00	0.565	0.1	0.6
2320.1	2320	607.58	2324	606.03	415.30	0.40%	10	0.011	0.003	0.580	0.01	1.022	0.3	1.2
2321.1	2321	606.87	2322	606.83	376.80	0.00%	10	0.011	0.002	0.540	0.01	0.172	0.8	0.9
2322.1	2322	606.83	2323	606.35	189.60	0.30%	10	0.011	0.004	0.580	0.01	0.842	0.5	1.1
2323.1	2323	606.35	2324	606.03	89.80	0.40%	10	0.011	0.004	0.570	0.01	0.999	0.4	1.0
2324.1	2324	606.03	2325	605.81	65.60	0.30%	10	0.011	0.011	0.810	0.04	0.969	1.1	5.3

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2325.1	2325	605.81	2318	605.08	179.50	0.40%	10	0.011	0.011	0.760	0.03	1.067	1.0	4.2
2326.1	2326	799.69	1585	796.34	130.10	2.60%	8	0.012	0.004	0.620	0.02	1.358	0.3	2.6
2327.1	2327	805.25	2330	800.90	187.70	2.30%	8	0.011	0.001	0.520	0.00	1.405	0.0	0.6
2328.1	2328	812.50	2327	805.25	220.10	3.30%	8	0.011	0.000	0.490	0.00	1.675	0.0	0.5
2329.1	2329	812.60	2328	812.50	229.60	0.00%	8	0.011	0.000	0.000	0.00	0.193	0.0	0.0
2330.1	2330	800.90	2326	799.69	86.40	1.40%	8	0.011	0.001	0.530	0.00	1.092	0.1	0.6
2331.1	2331	701.80	2017	700.75	24.40	4.30%	12	0.011	0.012	0.740	0.03	5.648	0.2	2.8
2332.1	2332	705.98	2331	701.80	300.50	1.40%	12	0.011	0.012	0.830	0.05	3.210	0.4	4.8
2333.1	2333	705.98	2332	705.98	127.90	0.00%	12	0.011	0.004	0.080	0.15	0.000	Infinity	14.9
2334.1	2334	706.83	2333	705.98	103.10	0.80%	8	0.011	0.004	0.600	0.01	0.838	0.4	2.1
2335.1	2335	709.61	2018	707.44	413.70	0.50%	8	0.011	0.004	0.630	0.02	0.669	0.5	3.1
2336.1	2336	709.82	2335	709.61	22.20	0.90%	8	0.011	0.004	0.590	0.01	0.899	0.4	1.7
2337.1	2337	711.17	1775	710.44	125.70	0.60%	8	0.011	0.004	0.610	0.02	0.703	0.5	2.6
2338.1	2338	711.70	2337	711.17	86.10	0.60%	8	0.011	0.004	0.610	0.02	0.724	0.5	2.6
2339.1	2339	712.27	2338	711.70	96.50	0.60%	8	0.011	0.004	0.620	0.02	0.709	0.5	2.6
2340.1	2340	713.23	2339	712.27	135.30	0.70%	8	0.011	0.000	0.000	0.00	0.777	0.0	0.0
2341.1	2341	713.46	2340	713.23	26.10	0.90%	8	0.011	0.000	0.000	0.00	0.867	0.0	0.0
2342.1	2342	713.70	2341	713.46	28.40	0.80%	8	0.011	0.000	0.000	0.00	0.848	0.0	0.0
2343.1	2343	718.14	2344	713.03	201.50	2.50%	8	0.011	0.000	0.000	0.00	1.470	0.0	0.0
2344.1	2344	713.03	2339	712.27	27.70	2.70%	8	0.011	0.000	0.000	0.00	1.529	0.0	0.0
2345.1	2345	708.11	2346	707.22	264.40	0.30%	21	0.011	0.002	0.540	0.09	7.021	0.0	5.4
2346.1	2346	707.22	2347	705.65	486.20	0.30%	21	0.011	0.002	0.540	0.09	6.877	0.0	5.3
2347.1	2347	705.65	2348	704.56	326.70	0.30%	21	0.011	0.002	0.540	0.00	6.990	0.0	0.3
2348.1	2348	704.56	2349	703.28	391.40	0.30%	21	0.011	0.002	0.540	0.10	6.921	0.0	5.5
2349.1	2349	703.28	2350	702.39	230.50	0.40%	21	0.011	0.002	0.540	0.00	7.520	0.0	0.3
2350.1	2350	702.39	2351	700.78	185.90	0.90%	21	0.011	0.002	0.540	0.00	11.263	0.0	0.3
2351.1	2351	700.78	2352	699.08	200.10	0.80%	21	0.011	0.002	0.540	0.00	11.154	0.0	0.3
2352.1	2352	699.08	2353	698.34	77.70	1.00%	21	0.011	0.002	0.540	0.00	11.812	0.0	0.3
2353.1	2353	698.34	2354	693.99	531.80	0.80%	21	0.011	0.002	0.540	0.00	10.946	0.0	0.3
2354.1	2354	693.99	2355	689.74	530.70	0.80%	21	0.011	0.002	0.540	0.00	10.830	0.0	0.3
2355.1	2355	689.74	2356	685.29	546.70	0.80%	21	0.011	0.002	0.540	0.00	10.919	0.0	0.3
2356.1	2356	685.29	7	683.56	132.50	1.30%	21	0.011	0.002	0.540	0.00	13.829	0.0	0.3
2357.1	2357	712.81	2358	709.57	172.80	1.90%	8	0.011	0.000	0.000	0.00	1.264	0.0	0.0
2358.1	2358	709.57	2359	708.83	217.40	0.30%	8	0.011	0.000	0.000	0.00	0.539	0.0	0.0
2359.1	2359	708.83	2360	707.53	353.80	0.40%	8	0.011	0.008	0.790	0.14	0.560	1.5	20.7
2360.1	2360	707.53	1277	706.71	210.40	0.40%	8	0.011	0.008	0.840	0.05	0.576	1.5	8.1
2361.1	2361	665.44	2362	663.91	197.80	0.80%	8	0.012	0.000	0.000	0.00	0.744	0.0	0.0
2362.1	2362	663.91	1237	662.26	309.10	0.50%	8	0.012	0.004	0.680	0.03	0.618	0.7	4.4
2363.1	2363	650.81	419	649.70	145.10	0.80%	21	0.011	0.844	4.000	0.34	10.584	8.0	19.3
2364.1	2364	742.40	314	741.43	173.90	0.60%	6	0.013	0.024	1.000	0.12	0.271	8.8	24.3

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2365.1	2365	719.25	2367	718.23	183.10	0.60%	6	0.015	0.005	0.670	0.03	0.235	2.3	5.2
2366.1	2366	717.37	217	716.49	176.30	0.50%	6	0.015	0.012	0.910	0.06	0.222	5.5	12.7
2367.1	2367	718.23	2366	717.37	171.80	0.50%	6	0.015	0.007	0.750	0.04	0.222	3.0	8.0
2368.1	2368	702.68	2369	698.46	210.00	2.00%	8	0.011	0.002	0.540	0.01	1.308	0.1	0.8
2369.1	2369	698.46	2256	691.60	300.30	2.30%	8	0.011	0.008	0.680	0.02	1.395	0.6	3.5
2370.1	2370	701.63	2369	698.46	475.20	0.70%	8	0.011	0.003	0.560	0.18	0.754	0.4	27.4
2371.1	2371	701.24	567	687.05	127.60	11.10%	8	0.011	0.000	0.460	0.00	3.078	0.0	0.5
2372.1	2372	703.76	2370	701.63	411.30	0.50%	8	0.011	0.000	0.460	0.00	0.664	0.1	0.5
2373.1	2373	754.67	302	753.30	280.70	0.50%	8	0.011	0.009	0.790	0.18	0.645	1.4	27.2
2374.1	2374	771.26	2285	770.85	60.60	0.70%	8	0.011	0.009	0.760	0.04	0.759	1.1	5.7
2375.1	2375	772.23	2374	771.26	175.00	0.60%	8	0.011	0.006	0.730	0.04	0.687	0.9	5.5
2376.1	2376	777.06	2375	772.23	58.90	8.20%	8	0.011	0.006	0.630	0.02	2.644	0.2	2.6
2377.1	2377	778.26	2376	777.06	145.80	0.80%	8	0.011	0.006	0.650	0.02	0.837	0.7	3.1
2378.1	2378	777.95	2379	775.00	203.80	1.40%	8	0.011	0.000	0.290	0.00	1.110	0.0	0.4
2379.1	2379	775.00	2374	771.26	112.20	3.30%	8	0.011	0.001	0.530	0.00	1.685	0.1	0.6
2380.1	2380	779.36	2377	778.26	303.90	0.40%	8	0.011	0.002	0.620	0.02	0.555	0.4	3.1
2381.1	2381	780.00	2380	779.36	61.30	1.00%	8	0.011	0.002	0.540	0.01	0.944	0.2	0.8
2382.1	2382	791.76	2381	780.00	317.40	3.70%	8	0.011	0.000	0.290	0.00	1.777	0.0	0.4
2383.1	2383	786.98	2377	778.26	215.00	4.10%	8	0.011	0.001	0.530	0.00	1.859	0.0	0.6
2384.1	2384	671.03	2385	670.07	266.70	0.40%	8	0.011	0.001	0.520	0.10	0.554	0.1	14.9
2385.1	2385	670.07	2386	668.99	298.20	0.40%	8	0.011	0.002	0.630	0.02	0.556	0.4	3.3
2386.1	2386	668.99	2387	668.45	128.90	0.40%	8	0.011	0.004	0.640	0.02	0.597	0.7	3.3
2387.1	2387	668.45	2388	660.83	397.00	1.90%	8	0.011	0.004	0.670	0.57	1.279	0.3	85.6
2388.1	2388	660.83	2389	660.24	145.20	0.40%	8	0.011	0.004	0.640	0.02	0.588	0.7	3.2
2389.1	2389	660.24	2390	659.30	246.60	0.40%	8	0.011	0.004	0.620	0.02	0.570	0.7	2.6
2390.1	2390	659.30	2395	659.10	30.70	0.70%	8	0.011	0.004	0.630	0.02	0.745	0.6	2.9
2391.1	2391	655.23	2392	653.33	528.20	0.40%	8	0.011	0.004	0.610	0.01	0.554	0.8	2.2
2392.1	2392	653.33	682	652.54	311.80	0.30%	15	0.011	0.164	1.620	0.23	2.484	6.6	18.4
2393.1	2393	656.79	2391	655.23	429.20	0.40%	8	0.011	0.004	0.650	0.02	0.556	0.8	3.6
2394.1	2394	657.76	2393	656.79	255.30	0.40%	8	0.011	0.004	0.690	0.13	0.569	0.7	19.2
2395.1	2395	659.10	2394	657.76	365.20	0.40%	8	0.011	0.004	0.650	0.12	0.559	0.8	17.9
2396.1	2396	682.59	2397	682.11	141.90	0.30%	8	0.011	0.000	0.000	0.00	0.537	0.0	0.0
2397.1	2397	682.11	2398	681.91	158.10	0.10%	8	0.011	0.000	0.000	0.00	0.328	0.0	0.0
2398.1	2398	681.91	2399	681.47	143.00	0.30%	8	0.011	0.000	0.000	0.00	0.512	0.0	0.0
2399.1	2399	681.47	2400	681.03	229.70	0.20%	8	0.011	0.000	0.000	0.00	0.404	0.0	0.0
2400.1	2400	681.03	2401	680.04	261.50	0.40%	8	0.011	0.000	0.000	0.10	0.568	0.0	14.9
2401.1	2401	680.04	2403	678.79	337.00	0.40%	8	0.011	0.020	0.860	0.11	0.562	3.6	16.1
2402.1	2402	681.12	2401	680.04	286.80	0.40%	8	0.011	0.000	0.000	0.11	0.566	0.0	16.2
2403.1	2403	678.79	983	677.81	287.70	0.30%	8	0.011	0.021	1.090	0.18	0.539	3.8	27.7
2404.1	2404	708.24	242	707.55	118.20	0.60%	4	0.015	0.000	0.000	0.00	0.082	0.0	0.0

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2405.1	2405	706.17	241	705.55	102.70	0.60%	6	0.015	0.000	0.000	0.00	0.244	0.0	0.0
2406.1	2406	704.65	239	697.70	284.90	2.40%	6	0.015	0.009	0.790	0.50	0.491	1.7	100.0
2407.1	2407	718.10	2408	717.28	143.70	0.60%	6	0.011	0.000	0.000	0.00	0.324	0.0	0.0
2408.1	2408	717.28	2409	715.70	296.50	0.50%	6	0.011	0.000	0.000	0.16	0.313	0.0	31.6
2409.1	2409	715.70	2410	713.90	340.20	0.50%	6	0.011	0.000	0.000	0.00	0.312	0.0	0.0
2410.1	2410	713.90	2347	705.65	16.20	51.10%	8	0.011	0.000	0.000	0.00	6.596	0.0	0.0
2413.1	2413	781.07	2415	778.18	114.40	2.50%	8	0.011	0.000	0.000	0.00	1.467	0.0	0.0
2414.1	2414	785.87	2415	778.18	211.60	3.60%	8	0.011	0.000	0.000	0.00	1.760	0.0	0.0
2415.1	2415	778.18	2135	775.60	168.60	1.50%	8	0.011	0.000	0.000	0.00	1.142	0.0	0.0
2416.1	2416	728.09	1936	722.77	79.10	6.70%	12	0.011	0.023	0.900	0.04	7.056	0.3	4.5
2417.1	2417	730.89	2416	728.09	293.70	1.00%	12	0.011	0.023	1.080	0.37	2.657	0.9	36.7
2418.1	2418	735.11	2417	730.89	341.30	1.20%	12	0.011	0.023	1.080	0.08	3.026	0.8	8.0
2419.1	2419	738.67	2418	735.11	343.00	1.00%	12	0.011	0.023	1.100	0.08	2.772	0.8	8.5
2420.1	2420	741.92	2419	738.67	314.80	1.00%	12	0.011	0.023	1.100	0.08	2.765	0.8	8.5
2421.1	2421	745.15	2420	741.92	301.70	1.10%	12	0.011	0.023	1.100	0.08	2.816	0.8	8.4
2422.1	2422	750.65	2004	745.38	102.20	5.20%	12	0.011	0.000	0.000	0.00	6.180	0.0	0.0
2423.1	2423	748.76	2421	745.15	359.00	1.00%	12	0.011	0.023	1.080	0.34	2.729	0.9	33.8
2424.1	2424	751.59	2423	748.76	359.90	0.80%	12	0.011	0.023	1.100	0.29	2.413	1.0	28.7
2425.1	2425	753.54	2424	751.59	249.20	0.80%	12	0.011	0.023	1.040	0.28	2.407	1.0	28.4
2426.1	2426	754.21	2425	753.54	79.20	0.80%	12	0.011	0.023	1.100	0.08	2.503	0.9	8.3
2427.1	2427	760.73	2005	759.05	463.80	0.40%	8	0.011	0.000	0.000	0.09	0.556	0.0	14.0
2428.1	2428	683.66	715	676.49	208.00	3.40%	8	0.011	0.001	0.530	0.00	1.714	0.1	0.7
2429.1	2429	685.08	727	676.28	319.40	2.80%	8	0.011	0.002	0.560	0.01	1.532	0.1	1.5
2431.1	2431	778.76	2432	776.10	354.70	0.70%	8	0.011	0.000	0.250	0.19	0.799	0.0	28.9
2432.1	2432	776.10	904	768.75	42.30	17.40%	8	0.011	0.001	0.530	0.00	3.847	0.0	0.7
2434.1	2434	649.61	2242	636.41	279.70	4.70%	8	0.011	0.002	0.540	0.67	2.005	0.1	100.0
2435.1	2435	673.69	2129	672.15	424.90	0.40%	8	0.011	0.057	1.250	0.17	0.556	10.2	25.5
2436.1	2436	683.21	1266	682.44	114.40	0.70%	12	0.011	0.058	1.520	0.13	2.233	2.6	12.9
2437.1	2437	701.89	2064	698.82	501.50	0.60%	12	0.012	0.189	2.250	0.22	1.952	9.7	22.2
2438.1	2438	651.80	970	651.42	100.50	0.40%	10	0.011	0.119	1.720	0.21	1.029	11.5	25.0
2439.1	2439	727.00	1455	701.70	347.50	7.30%	8	0.011	0.000	0.000	0.00	2.491	0.0	0.0
2440.1	2440	715.00	1480	712.60	148.40	1.60%	8	0.011	0.000	0.000	0.00	1.174	0.0	0.0
2441.1	2441	682.31	2220	677.47	238.00	2.00%	8	0.011	0.025	1.090	0.08	1.316	1.9	11.7
2442.1	2442	666.41	1068	665.15	257.50	0.50%	8	0.011	0.031	1.010	0.26	0.646	4.8	38.3
2443.1	2443	724.26	172	723.21	301.50	0.30%	8	0.015	0.155	1.500	0.31	0.399	38.8	46.7
2444.1	2444	730.60	1051	724.55	362.50	1.70%	8	0.012	0.000	0.000	0.43	1.093	0.0	64.8
2445.1	2445	701.58	582	701.58	68.60	0.00%	8	0.011	0.000	0.000	0.14	0.000	(N/A)	20.7
2446.1	2446	703.20	2445	701.58	296.20	0.50%	8	0.011	0.000	0.000	0.16	0.683	0.0	24.3
2447.1	2447	704.56	2446	703.20	392.10	0.30%	8	0.011	0.000	0.000	0.10	0.544	0.0	14.6
2448.1	2448	705.62	2447	704.56	256.50	0.40%	8	0.011	0.000	0.000	0.11	0.593	0.0	15.9

Appendix 1.1

Existing System Dry Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2449.1	2449	702.90	755	702.00	296.80	0.30%	8	0.011	0.000	0.000	0.09	0.508	0.0	13.5
2450.1	2450	704.63	2449	702.90	320.90	0.50%	8	0.011	0.000	0.000	0.00	0.678	0.0	0.0
2451.1	2451	712.58	2475	708.01	474.50	1.00%	8	0.011	0.000	0.000	0.25	0.906	0.0	38.1
2452.1	2452	677.09	958	675.09	397.00	0.50%	8	0.011	0.000	0.000	0.14	0.655	0.0	21.4
2453.1	2453	687.55	2452	677.09	165.30	6.30%	8	0.011	0.000	0.000	0.00	2.322	0.0	0.0
2454.1	2454	690.40	2453	687.55	419.00	0.70%	8	0.011	0.000	0.000	0.00	0.761	0.0	0.0
2455.1	2455	698.25	2454	690.40	312.10	2.50%	8	0.011	0.000	0.000	0.00	1.464	0.0	0.0
2456.1	2456	734.86	2359	708.83	49.40	52.70%	6	0.011	0.008	0.620	0.01	3.110	0.3	2.4
2457.1	2457	737.43	2456	734.86	69.40	3.70%	6	0.011	0.008	0.680	0.02	0.825	1.0	4.8
2458.1	2458	744.96	2457	737.43	433.10	1.70%	6	0.011	0.000	0.000	0.00	0.565	0.0	0.0
2459.1	2459	746.32	2458	744.96	90.80	1.50%	6	0.011	0.000	0.000	0.00	0.525	0.0	0.0
2460.1	2460	673.54	2264	670.40	262.70	1.20%	8	0.011	0.021	0.720	0.32	1.009	2.1	48.7
2461.1	2461	674.30	2460	673.54	132.60	0.60%	8	0.011	0.007	0.730	0.03	0.699	1.0	5.1
2462.1	2462	678.53	2461	674.30	253.10	1.70%	8	0.011	0.002	0.540	0.43	1.193	0.2	64.2
2463.1	2463	684.03	2462	678.53	164.00	3.40%	8	0.011	0.001	0.530	0.00	1.690	0.1	0.6
2464.1	2464	688.86	2463	684.03	144.70	3.30%	8	0.011	0.000	0.000	0.00	1.686	0.0	0.0
2465.1	2465	682.68	2466	680.26	117.70	2.10%	8	0.011	0.000	0.000	0.00	1.323	0.0	0.0
2466.1	2466	680.26	2467	675.75	111.60	4.00%	8	0.011	0.001	0.530	0.00	1.856	0.0	0.6
2467.1	2467	675.75	2461	674.30	271.10	0.50%	8	0.011	0.005	0.660	0.17	0.675	0.8	25.3
2468.1	2468	676.45	2467	675.75	122.50	0.60%	8	0.011	0.005	0.640	0.02	0.698	0.6	3.3
2469.1	2469	677.67	2468	676.45	221.40	0.60%	8	0.011	0.003	0.630	0.02	0.685	0.5	3.3
2470.1	2470	678.42	2469	677.67	102.70	0.70%	8	0.011	0.002	0.540	0.01	0.789	0.2	0.8
2471.1	2471	679.22	2470	678.42	112.10	0.70%	8	0.011	0.002	0.550	0.01	0.780	0.2	1.2
2472.1	2472	680.18	2471	679.22	136.70	0.70%	8	0.011	0.001	0.530	0.00	0.774	0.2	0.7
2473.1	2473	684.59	2472	680.18	118.00	3.70%	8	0.011	0.000	0.340	0.00	1.784	0.0	0.4
2474.1	2474	682.66	2472	680.18	148.70	1.70%	8	0.011	0.000	0.000	0.00	1.192	0.0	0.0
2475.1	2475	708.01	2449	702.90	437.10	1.20%	8	0.011	0.000	0.000	0.00	0.998	0.0	0.0
2476.1	2476	656.02	961	655.67	58.10	0.60%	8	0.011	0.025	1.090	0.11	0.717	3.5	16.0
2477.1	2477	648.54	611	647.34	221.30	0.50%	10	0.012	0.093	1.580	0.19	1.130	8.2	22.3
2478.1	2478	778.73	2164	778.29	836.40	0.10%	8	0.013	0.010	0.480	0.09	0.179	5.3	14.2
2479.1	2479	781.50	LS_BMS	780.83	414.40	0.20%	8	0.013	0.018	0.080	0.67	0.314	5.7	100.0
3343.1	334	695.20	375	692.37	135.60	2.10%	10	0.015	0.300	3.550	0.24	1.773	16.9	28.9
CO-1	2100	657.90	W-4	657.80	12.10	0.80%	12	0.013	0.003	0.100	0.11	2.090	0.1	10.5
CO-10	MH-10	742.80	1982	738.59	1216.00	0.30%	8	0.013	0.077	1.260	0.21	0.460	16.8	31.6

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
0.1	0	673.52	2	672.16	312.80	0.40%	21	0.011	0.005	0.670	0.03	7.980	0.1	1.5
1.1	1	675.14	0	673.52	372.50	0.40%	21	0.011	0.005	0.630	0.13	7.982	0.1	7.6
2.1	2	672.16	30	671.65	86.10	0.60%	21	0.011	0.028	0.950	0.09	9.313	0.3	5.1
3.1	3	676.75	1	675.14	381.60	0.40%	21	0.011	0.005	0.630	0.13	7.861	0.1	7.6
4.1	4	679.10	3	676.75	448.80	0.50%	21	0.011	0.005	0.650	0.15	8.758	0.1	8.7
5.1	5	681.47	4	679.10	446.30	0.50%	21	0.011	0.005	0.640	0.02	8.819	0.1	1.2
6.1	6	682.93	5	681.47	274.70	0.50%	21	0.011	0.005	0.640	0.17	8.822	0.1	9.5
7.1	7	683.56	6	682.93	103.80	0.60%	21	0.011	0.005	0.650	0.02	9.426	0.1	1.2
8.1	8	689.40	7	683.56	446.50	1.30%	8	0.011	0.003	0.570	0.01	1.056	0.3	1.3
9.1	9	694.00	8	689.40	445.40	1.00%	8	0.011	0.003	0.580	0.01	0.938	0.4	1.6
10.1	10	696.31	9	694.00	349.20	0.70%	8	0.011	0.000	0.000	0.17	0.751	0.0	24.8
11.1	11	700.50	10	696.31	272.80	1.50%	8	0.011	0.000	0.000	0.42	1.144	0.0	62.8
12.1	12	653.54	899	652.26	388.60	0.30%	27	0.011	0.471	2.380	0.39	13.576	3.5	17.1
13.1	13	654.43	12	653.54	85.80	1.00%	24	0.011	0.147	2.030	0.15	17.593	0.8	7.7
14.1	14	655.55	13	654.43	316.90	0.40%	24	0.011	0.147	1.640	0.18	10.272	1.4	9.0
15.1	15	656.27	14	655.55	346.00	0.20%	24	0.011	0.147	1.360	0.20	7.882	1.9	10.2
16.1	16	656.70	15	656.27	338.70	0.10%	24	0.011	0.148	1.150	0.23	6.157	2.4	11.4
17.1	17	657.72	16	656.70	421.80	0.20%	24	0.011	0.148	1.440	0.20	8.497	1.7	9.8
18.1	18	658.65	17	657.72	394.20	0.20%	24	0.011	0.148	1.430	0.26	8.393	1.8	13.2
19.1	19	659.20	18	658.65	285.50	0.20%	24	0.011	0.100	1.130	0.23	7.583	1.3	11.6
20.1	20	659.93	19	659.20	349.70	0.20%	24	0.011	0.100	1.160	0.23	7.895	1.3	11.3
21.1	21	661.25	20	659.93	501.00	0.30%	24	0.011	0.100	1.260	0.16	8.870	1.1	8.2
22.1	22	662.00	21	661.25	476.00	0.20%	24	0.011	0.100	1.060	0.23	6.859	1.5	11.4
23.1	23	662.60	22	662.00	281.20	0.20%	24	0.011	0.100	1.170	0.23	7.982	1.3	11.7
24.1	24	663.55	23	662.60	337.80	0.30%	24	0.011	0.101	1.290	0.16	9.164	1.1	8.1
25.1	25	663.80	24	663.55	360.70	0.10%	24	0.011	0.101	0.800	0.24	4.549	2.2	12.1
26.1	26	664.50	25	663.80	334.30	0.20%	24	0.011	0.100	1.160	0.17	7.907	1.3	8.7
27.1	27	665.80	26	664.50	522.70	0.20%	24	0.011	0.100	1.240	0.17	8.617	1.2	8.3
28.1	28	667.87	2204	667.73	42.90	0.30%	15	0.011	0.072	1.260	0.16	2.819	2.5	12.4
29.1	29	669.70	2205	667.20	355.70	0.70%	21	0.011	0.028	0.990	0.26	10.145	0.3	15.1
30.1	30	671.65	29	669.70	351.80	0.60%	21	0.011	0.028	0.860	0.23	9.011	0.3	13.4
31.1	31	666.20	18	658.65	451.50	1.70%	12	0.011	0.053	1.390	0.52	3.519	1.5	51.5
32.1	32	673.90	31	666.20	506.40	1.50%	12	0.011	0.053	1.410	0.10	3.356	1.6	9.9
33.1	33	679.85	34	678.86	166.80	0.60%	12	0.011	0.947	3.950	0.48	2.096	45.2	47.8
34.1	34	678.86	35	678.05	142.10	0.60%	12	0.011	0.947	3.900	0.48	2.055	46.1	48.3
35.1	35	678.05	36	676.54	277.00	0.50%	12	0.011	0.947	3.830	0.64	2.009	47.1	64.1
36.1	36	676.54	37	675.74	230.60	0.30%	12	0.011	0.948	3.250	0.56	1.603	59.1	55.9
37.1	37	675.74	38	675.04	200.00	0.30%	12	0.011	0.947	3.270	0.56	1.610	58.8	55.6
38.1	38	675.04	39	674.46	159.70	0.40%	12	0.011	0.947	3.320	0.55	1.640	57.7	54.8
39.1	39	674.46	40	673.85	170.30	0.40%	12	0.011	0.946	3.300	0.55	1.629	58.1	55.1

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
40.1	40	673.85	41	673.38	124.90	0.40%	12	0.011	0.947	3.380	0.54	1.670	56.7	54.1
41.1	41	673.38	42	672.99	118.00	0.30%	12	0.011	0.947	3.270	0.56	1.564	60.5	55.6
42.1	42	672.99	43	672.60	117.50	0.30%	12	0.011	0.948	3.270	0.56	1.568	60.5	55.5
43.1	43	672.60	44	672.02	190.90	0.30%	12	0.011	0.949	3.130	0.58	1.500	63.3	57.6
44.1	44	672.02	45	671.63	132.10	0.30%	12	0.011	0.949	3.160	0.57	1.479	64.2	57.1
45.1	45	671.63	2031	662.61	600.40	1.50%	12	0.011	0.948	5.430	0.38	3.335	28.4	37.6
46.1	46	674.83	39	674.46	90.30	0.40%	6	0.011	0.000	0.000	0.39	0.274	0.0	78.8
47.1	47	675.32	46	674.83	78.20	0.60%	6	0.011	0.000	0.000	0.00	0.339	0.0	0.0
48.1	48	694.42	986	686.84	264.20	2.90%	8	0.011	0.002	0.540	0.67	1.563	0.1	100.0
49.1	49	667.50	985	656.99	205.40	5.10%	8	0.011	0.008	0.690	0.02	2.088	0.4	3.7
50.1	50	650.00	1422	644.14	61.20	9.60%	8	0.011	0.021	0.900	0.05	2.856	0.7	7.2
51.1	51	654.46	50	650.00	233.00	1.90%	8	0.011	0.016	0.920	0.06	1.277	1.3	8.8
52.1	52	655.00	51	654.46	109.20	0.50%	8	0.011	0.016	1.020	0.08	0.649	2.5	11.9
53.1	53	655.40	52	655.00	76.70	0.50%	8	0.011	0.016	1.010	0.08	0.667	2.4	11.6
54.1	54	666.51	53	655.40	362.20	3.10%	8	0.011	0.013	0.830	0.67	1.616	0.8	100.0
55.1	55	676.70	54	666.51	172.90	5.90%	8	0.011	0.011	0.750	0.03	2.241	0.5	4.8
56.1	56	677.21	55	676.70	102.80	0.50%	8	0.011	0.011	0.860	0.06	0.650	1.7	8.3
57.1	57	682.00	56	677.21	186.00	2.60%	8	0.011	0.000	0.000	0.00	1.481	0.0	0.0
58.1	58	677.82	56	677.21	129.70	0.50%	8	0.011	0.009	0.810	0.05	0.633	1.4	7.2
59.1	59	678.40	58	677.82	126.00	0.50%	8	0.011	0.009	0.800	0.05	0.626	1.4	7.0
60.1	60	679.20	59	678.40	115.90	0.70%	8	0.011	0.004	0.660	0.03	0.767	0.5	3.9
61.1	61	681.69	60	679.20	258.50	1.00%	8	0.011	0.000	0.430	0.25	0.906	0.0	37.8
62.1	62	702.98	59	678.40	405.80	6.10%	8	0.011	0.000	0.000	0.00	2.272	0.0	0.0
63.1	63	695.01	65	694.44	133.40	0.40%	8	0.011	0.004	0.630	0.02	0.603	0.6	3.0
64.1	64	695.53	63	695.01	120.30	0.40%	8	0.011	0.000	0.000	0.00	0.607	0.0	0.0
65.1	65	694.44	66	685.22	327.00	2.80%	8	0.011	0.005	0.650	0.02	1.550	0.3	3.3
66.1	66	685.22	67	677.24	325.00	2.50%	8	0.011	0.009	0.690	0.02	1.446	0.6	3.7
67.1	67	677.24	68	672.47	71.80	6.60%	8	0.011	0.013	0.770	0.03	2.378	0.5	5.2
68.1	68	672.47	69	669.67	164.50	1.70%	8	0.011	0.013	0.850	0.05	1.204	1.1	7.5
69.1	69	669.67	70	667.40	163.30	1.40%	8	0.011	0.013	0.800	0.04	1.088	1.2	5.8
70.1	70	667.40	71	662.40	163.70	3.10%	8	0.011	0.015	0.870	0.05	1.613	0.9	7.7
71.1	71	662.40	1420	652.06	166.60	6.20%	8	0.011	0.021	0.910	0.05	2.300	0.9	7.5
72.1	72	663.75	73	663.36	83.40	0.50%	8	0.011	0.000	0.000	0.00	0.631	0.0	0.0
73.1	73	663.36	71	662.40	245.60	0.40%	8	0.011	0.002	0.540	0.01	0.577	0.3	0.8
74.1	74	705.06	75	705.02	140.20	0.00%	8	0.011	0.000	0.000	0.00	0.156	0.0	0.0
75.1	75	705.02	76	703.27	501.80	0.30%	8	0.011	0.002	0.610	0.02	0.545	0.4	2.7
76.1	76	703.27	77	697.90	462.60	1.20%	8	0.011	0.006	0.630	0.32	0.995	0.6	47.3
77.1	77	697.90	78	685.43	350.00	3.60%	8	0.011	0.010	0.730	0.67	1.742	0.6	100.0
78.1	78	685.43	79	658.55	404.10	6.70%	8	0.011	0.014	0.790	0.04	2.380	0.6	5.6
79.1	79	658.55	80	651.67	94.70	7.30%	8	0.011	0.019	0.870	0.05	2.488	0.7	6.8

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
80.1	80	651.67	81	650.87	295.10	0.30%	27	0.011	0.645	2.460	0.44	12.317	5.2	19.4
81.1	81	650.87	1927	650.30	233.80	0.20%	27	0.011	0.698	2.440	0.38	11.681	6.0	16.9
82.1	82	663.40	81	650.87	92.60	13.50%	8	0.011	0.019	0.820	0.03	3.396	0.5	5.2
83.1	83	688.12	82	663.40	373.40	6.60%	8	0.011	0.014	0.800	0.67	2.375	0.6	100.0
84.1	84	689.87	83	688.12	500.90	0.30%	8	0.011	0.010	0.860	0.06	0.546	1.8	8.7
85.1	85	691.62	84	689.87	500.70	0.30%	8	0.011	0.005	0.710	0.03	0.546	0.9	5.1
86.1	86	693.00	85	691.62	389.10	0.40%	8	0.011	0.002	0.540	0.10	0.550	0.3	15.6
87.1	87	699.30	874	681.90	436.50	4.00%	8	0.011	0.006	0.640	0.02	1.843	0.3	2.8
88.1	88	700.95	87	699.30	390.30	0.40%	8	0.011	0.000	0.000	0.12	0.600	0.0	17.7
89.1	89	701.00	880	688.60	242.40	5.10%	8	0.011	0.000	0.000	0.00	2.088	0.0	0.0
90.1	90	705.70	91	680.30	328.80	7.70%	8	0.011	0.000	0.000	0.00	2.565	0.0	0.0
91.1	91	680.30	873	680.20	500.20	0.00%	8	0.011	0.005	0.320	0.08	0.131	3.5	11.4
92.1	92	702.44	93	686.30	440.30	3.70%	8	0.011	0.064	1.500	0.10	1.767	3.6	15.2
93.1	93	686.30	94	662.79	395.50	5.90%	8	0.011	0.064	1.460	0.67	2.250	2.9	100.0
94.4	94	662.79	862	661.88	206.30	0.40%	8	0.011	0.097	1.710	0.20	0.613	15.8	29.8
95.1	95	646.34	1256	645.68	278.90	0.20%	27	0.011	0.938	2.650	0.51	11.507	8.2	22.5
96.1	96	610.53	616	609.06	287.30	0.50%	8	0.011	0.046	1.400	0.28	0.660	7.0	42.4
97.1	97	612.22	96	610.53	158.90	1.10%	8	0.011	0.002	0.540	0.01	0.952	0.2	0.8
98.1	98	611.72	96	610.53	217.90	0.50%	8	0.011	0.042	1.220	0.14	0.682	6.2	21.1
99.1	99	613.71	98	611.72	377.00	0.50%	8	0.011	0.039	1.160	0.28	0.671	5.8	41.9
100.1	100	615.41	99	613.71	297.30	0.60%	8	0.011	0.036	1.150	0.30	0.698	5.2	45.2
101.1	101	620.83	100	615.41	323.50	1.70%	8	0.011	0.012	0.810	0.04	1.195	1.0	6.6
102.1	102	615.77	100	615.41	298.30	0.10%	8	0.011	0.020	0.580	0.14	0.321	6.4	21.2
103.1	103	616.36	102	615.77	451.40	0.10%	8	0.011	0.000	0.420	0.04	0.334	0.1	5.4
104.1	104	624.00	102	615.77	305.80	2.70%	8	0.011	0.015	0.840	0.04	1.514	1.0	6.6
105.1	105	633.04	104	624.00	309.80	2.90%	8	0.011	0.010	0.700	0.02	1.577	0.6	3.7
106.1	106	627.92	104	624.00	305.30	1.30%	8	0.011	0.001	0.530	0.00	1.046	0.1	0.7
107.1	107	639.00	105	633.04	226.20	2.60%	8	0.011	0.000	0.320	0.00	1.498	0.0	0.4
108.1	108	643.85	614	642.87	98.30	1.00%	8	0.011	0.000	0.320	0.00	0.921	0.0	0.4
109.1	109	744.16	110	735.13	447.50	2.00%	8	0.011	0.001	0.530	0.51	1.311	0.1	75.9
110.1	110	735.13	111	728.55	216.70	3.00%	8	0.011	0.005	0.600	0.01	1.608	0.3	2.0
111.1	111	728.55	112	721.77	229.60	3.00%	8	0.011	0.006	0.640	0.02	1.586	0.4	2.7
112.1	112	721.77	113	717.15	205.10	2.30%	8	0.011	0.008	0.740	0.04	1.385	0.6	5.5
113.1	113	717.15	114	715.96	218.10	0.50%	8	0.011	0.009	0.830	0.05	0.682	1.4	7.7
114.1	114	715.96	115	715.37	98.60	0.60%	8	0.011	0.011	0.830	0.05	0.714	1.5	7.4
115.1	115	715.37	116	714.67	119.40	0.60%	8	0.011	0.011	0.840	0.05	0.707	1.6	7.5
116.1	116	714.67	1650	711.15	327.40	1.10%	8	0.012	0.011	0.810	0.05	0.877	1.3	6.8
117.1	117	739.67	118	727.99	335.10	3.50%	8	0.011	0.000	0.160	0.00	1.723	0.0	0.3
118.1	118	727.99	119	720.49	289.50	2.60%	8	0.011	0.002	0.540	0.67	1.486	0.1	100.0
119.1	119	720.49	1004	709.38	330.20	3.40%	8	0.012	0.010	0.620	0.01	1.552	0.6	1.3

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
120.1	120	727.93	121	726.79	41.00	2.80%	8	0.011	0.000	0.160	0.00	1.539	0.0	0.3
121.1	121	726.79	119	720.49	344.40	1.80%	8	0.011	0.002	0.580	0.01	1.248	0.2	1.8
122.1	122	735.54	121	726.79	283.00	3.10%	8	0.011	0.000	0.320	0.67	1.623	0.0	100.0
123.1	123	673.19	2	672.16	227.70	0.50%	12	0.011	0.023	1.020	0.09	1.830	1.3	9.0
124.1	124	684.13	123	673.19	298.60	3.70%	12	0.011	0.023	0.990	0.06	5.208	0.4	6.2
125.1	125	692.09	124	684.13	239.70	3.30%	12	0.011	0.023	0.940	0.05	4.959	0.5	5.3
126.1	126	695.66	125	692.09	361.90	1.00%	12	0.011	0.000	0.000	0.26	2.703	0.0	25.5
127.1	127	697.50	126	695.66	368.20	0.50%	12	0.011	0.000	0.000	0.13	1.924	0.0	13.1
128.1	128	698.43	127	697.50	185.00	0.50%	12	0.011	0.000	0.000	0.00	1.929	0.0	0.0
129.1	129	700.76	128	698.43	446.10	0.50%	12	0.011	0.000	0.000	0.00	1.967	0.0	0.0
130.1	130	717.02	131	716.00	102.00	1.00%	6	0.011	0.000	0.000	0.00	0.429	0.0	0.0
131.1	131	716.00	132	715.52	47.90	1.00%	6	0.011	0.000	0.000	0.00	0.429	0.0	0.0
132.1	132	715.52	133	709.67	64.50	9.10%	6	0.011	0.000	0.000	0.00	1.290	0.0	0.0
133.1	133	709.67	135	706.84	214.90	1.30%	8	0.011	0.000	0.000	0.00	1.059	0.0	0.0
134.1	134	707.75	135	706.84	43.50	2.10%	6	0.011	0.000	0.000	0.00	0.620	0.0	0.0
135.1	135	706.84	129	700.76	470.60	1.30%	8	0.011	0.000	0.000	0.34	1.049	0.0	50.7
136.1	136	713.39	133	709.67	293.00	1.30%	8	0.011	0.000	0.000	0.37	1.040	0.0	55.8
137.1	137	716.11	136	713.39	99.70	2.70%	8	0.011	0.000	0.000	0.00	1.525	0.0	0.0
138.1	138	717.89	137	716.11	337.00	0.50%	8	0.011	0.000	0.000	0.00	0.671	0.0	0.0
139.1	139	719.03	138	717.89	208.00	0.50%	8	0.011	0.000	0.000	0.00	0.683	0.0	0.0
140.1	140	721.63	139	719.03	499.90	0.50%	8	0.011	0.000	0.000	0.00	0.666	0.0	0.0
141.1	141	722.22	140	721.63	49.40	1.20%	6	0.011	0.000	0.000	0.00	0.469	0.0	0.0
142.1	142	722.51	141	722.22	18.70	1.60%	6	0.011	0.000	0.000	0.00	0.534	0.0	0.0
143.1	143	723.12	142	722.51	12.20	5.00%	4	0.011	0.000	0.000	0.00	0.325	0.0	0.0
144.1	144	723.91	143	723.12	79.50	1.00%	4	0.011	0.000	0.000	0.00	0.145	0.0	0.0
145.1	145	704.04	127	697.50	262.80	2.50%	8	0.011	0.000	0.000	0.65	1.456	0.0	98.1
146.1	146	745.33	1136	740.04	499.20	1.10%	8	0.013	0.000	0.000	0.00	0.804	0.0	0.0
146.2	146	745.33	147	738.44	257.80	2.70%	8	0.011	0.001	0.520	0.67	1.509	0.0	100.0
147.1	147	738.44	1137	735.43	500.00	0.60%	8	0.013	0.002	0.540	0.01	0.606	0.3	0.8
148.1	148	738.72	147	738.44	59.70	0.50%	8	0.011	0.000	0.270	0.00	0.632	0.0	0.4
149.1	149	725.31	1138	724.06	61.50	2.00%	8	0.013	0.011	0.750	0.03	1.113	1.0	4.9
150.1	150	729.80	149	725.31	257.50	1.70%	8	0.013	0.005	0.660	0.47	1.031	0.5	71.1
151.1	151	748.88	157	745.99	555.00	0.50%	6	0.015	0.000	0.000	0.13	0.227	0.0	26.3
152.1	152	748.33	157	745.99	460.20	0.50%	6	0.015	0.000	0.000	0.13	0.224	0.0	26.0
153.1	153	746.01	159	743.41	502.90	0.50%	6	0.015	0.000	0.000	0.00	0.226	0.0	0.0
154.1	154	736.63	166	733.53	520.90	0.60%	6	0.015	0.035	0.990	0.16	0.242	14.3	32.0
155.1	155	740.50	154	736.63	649.10	0.60%	6	0.015	0.033	0.910	0.31	0.243	13.5	62.3
156.1	156	741.50	155	740.50	167.30	0.60%	6	0.015	0.030	0.900	0.15	0.243	12.4	30.9
157.1	157	745.99	158	745.23	124.20	0.60%	6	0.015	0.000	0.000	0.00	0.246	0.0	0.0
158.1	158	745.23	159	743.41	295.90	0.60%	6	0.015	0.000	0.000	0.18	0.247	0.0	36.4

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
159.1	159	743.41	553	742.47	154.10	0.60%	6	0.015	0.000	0.000	0.00	0.245	0.0	0.0
160.1	160	741.76	155	740.50	251.60	0.50%	6	0.015	0.001	0.530	0.13	0.222	0.4	26.0
161.1	161	734.74	166	733.53	305.70	0.40%	8	0.015	0.158	1.580	0.30	0.426	37.0	45.3
162.1	162	736.66	161	734.74	236.20	0.80%	6	0.015	0.005	0.290	0.10	0.283	1.7	19.1
163.1	163	740.03	162	736.66	163.60	2.10%	6	0.015	0.000	0.000	0.00	0.451	0.0	0.0
164.1	164	741.26	163	740.03	225.70	0.50%	6	0.015	0.000	0.000	0.00	0.232	0.0	0.0
165.1	165	738.68	162	736.66	386.60	0.50%	6	0.015	0.000	0.000	0.14	0.227	0.0	28.9
166.1	166	733.53	167	732.30	342.00	0.40%	8	0.015	0.188	1.620	0.34	0.406	46.3	51.0
167.1	167	732.30	168	726.49	108.70	5.30%	8	0.015	0.184	2.740	0.16	1.565	11.8	24.4
168.1	168	726.49	169	725.06	369.00	0.40%	8	0.015	0.186	1.660	0.43	0.421	44.2	65.1
169.1	169	725.06	2443	724.26	218.30	0.40%	8	0.015	0.190	1.640	0.34	0.410	46.4	51.1
170.1	170	732.20	169	725.06	233.20	3.10%	6	0.015	0.002	0.540	0.01	0.550	0.3	1.0
171.1	171	733.36	170	732.20	213.20	0.50%	6	0.015	0.000	0.000	0.00	0.232	0.0	0.0
172.1	172	723.21	173	722.34	169.30	0.50%	8	0.015	0.202	1.900	0.32	0.485	41.6	47.7
173.1	173	722.34	189	720.57	465.80	0.40%	8	0.015	0.203	1.700	0.45	0.417	48.7	67.2
174.1	174	744.50	172	723.21	576.10	3.70%	6	0.015	0.000	0.000	0.50	0.604	0.0	100.0
175.1	175	739.50	167	732.30	184.30	3.90%	6	0.015	0.000	0.000	0.00	0.621	0.0	0.0
176.1	176	735.00	171	733.36	293.30	0.60%	6	0.015	0.000	0.000	0.16	0.235	0.0	32.8
177.1	177	721.04	178	720.16	156.50	0.60%	6	0.015	0.000	0.000	0.00	0.236	0.0	0.0
178.1	178	720.16	179	718.03	405.60	0.50%	6	0.015	0.000	0.000	0.00	0.228	0.0	0.0
179.1	179	718.03	180	715.92	265.70	0.80%	6	0.015	0.000	0.000	0.21	0.280	0.0	42.2
180.1	180	715.92	190	715.74	302.60	0.10%	8	0.015	0.236	1.140	0.58	0.165	143.0	86.4
181.1	181	723.61	182	722.99	103.60	0.60%	6	0.015	0.000	0.000	0.00	0.243	0.0	0.0
182.1	182	722.99	183	722.65	47.80	0.70%	6	0.015	0.000	0.000	0.00	0.265	0.0	0.0
183.1	183	722.65	184	721.75	161.00	0.60%	6	0.015	0.000	0.000	0.00	0.235	0.0	0.0
184.1	184	721.75	186	721.48	33.80	0.80%	6	0.015	0.000	0.000	0.00	0.281	0.0	0.0
185.1	185	722.07	184	721.75	43.60	0.70%	6	0.015	0.000	0.000	0.00	0.269	0.0	0.0
186.1	186	721.48	189	720.57	162.10	0.60%	6	0.015	0.000	0.000	0.00	0.236	0.0	0.0
187.1	187	722.40	186	721.48	164.50	0.60%	6	0.015	0.000	0.000	0.00	0.235	0.0	0.0
188.1	188	723.34	187	722.40	168.90	0.60%	6	0.015	0.000	0.000	0.00	0.235	0.0	0.0
189.1	189	720.57	180	715.92	564.50	0.80%	8	0.015	0.219	2.320	0.50	0.614	35.6	75.3
190.1	190	715.74	191	714.93	194.60	0.40%	8	0.015	0.254	1.880	0.39	0.437	58.2	57.8
191.1	191	714.93	192	713.93	238.80	0.40%	8	0.015	0.289	1.950	0.41	0.438	65.9	62.2
192.1	192	713.93	193	712.60	336.10	0.40%	8	0.015	0.290	1.910	0.42	0.426	68.0	63.6
193.1	193	712.60	194	707.00	46.90	11.90%	8	0.015	0.289	3.550	0.16	2.339	12.3	24.5
194.1	194	707.00	2114	705.89	262.70	0.40%	12	0.015	0.342	2.060	0.47	1.297	26.4	47.4
195.1	195	704.50	197	691.90	277.30	4.50%	12	0.015	0.345	4.180	1.00	4.254	8.1	100.0
196.1	196	714.85	195	704.50	591.10	1.80%	10	0.015	0.001	0.530	0.47	1.624	0.1	57.0
197.1	197	691.90	230	682.00	431.70	2.30%	12	0.015	0.380	3.910	0.25	3.022	12.6	24.6
198.1	198	719.00	192	713.93	316.10	1.60%	6	0.015	0.001	0.520	0.00	0.398	0.1	0.7

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
199.1	199	709.26	194	707.00	438.70	0.50%	8	0.015	0.052	1.040	0.18	0.486	10.6	27.2
200.1	200	709.89	199	709.26	171.00	0.40%	8	0.015	0.050	0.970	0.19	0.411	12.3	28.1
201.1	201	722.90	200	709.89	472.30	2.80%	6	0.015	0.004	0.650	0.50	0.522	0.7	100.0
202.1	202	724.73	201	722.90	352.50	0.50%	6	0.015	0.000	0.000	0.13	0.227	0.0	26.1
203.1	203	729.19	190	715.74	670.20	2.00%	6	0.015	0.016	1.000	0.50	0.445	3.6	100.0
204.1	204	730.77	203	729.19	292.90	0.50%	6	0.015	0.001	0.530	0.16	0.231	0.4	32.4
205.1	205	737.31	203	729.19	142.80	5.70%	6	0.015	0.002	0.540	0.01	0.750	0.2	1.0
206.1	206	738.79	205	737.31	276.60	0.50%	6	0.015	0.000	0.000	0.15	0.230	0.0	29.6
207.1	207	723.98	201	722.90	197.00	0.50%	6	0.015	0.000	0.000	0.00	0.233	0.0	0.0
208.1	208	736.46	203	729.19	529.10	1.40%	6	0.015	0.009	0.830	0.05	0.368	2.4	10.3
209.1	209	738.99	208	736.46	506.60	0.50%	6	0.015	0.004	0.720	0.04	0.222	1.9	7.4
210.1	210	739.98	213	731.19	570.70	1.50%	6	0.015	0.017	1.040	0.48	0.390	4.3	96.1
211.1	211	740.66	210	739.98	177.30	0.40%	6	0.015	0.003	0.560	0.01	0.195	1.5	1.3
212.1	212	741.49	211	740.66	217.30	0.40%	6	0.015	0.003	0.550	0.01	0.194	1.5	1.2
213.1	213	731.19	214	723.19	497.50	1.60%	6	0.015	0.021	1.150	0.10	0.399	5.3	19.7
214.1	214	723.19	215	710.68	402.00	3.10%	6	0.015	0.023	1.110	0.09	0.554	4.2	17.1
215.1	215	710.68	200	709.89	173.70	0.50%	8	0.015	0.046	1.010	0.17	0.457	10.2	25.6
216.1	216	714.99	215	710.68	327.60	1.30%	8	0.015	0.020	1.100	0.09	0.776	2.6	13.2
217.1	217	716.49	216	714.99	300.70	0.50%	6	0.015	0.012	0.750	0.09	0.222	5.3	18.1
218.1	218	718.32	2366	717.37	189.70	0.50%	6	0.015	0.004	0.580	0.01	0.222	1.8	1.9
219.1	219	734.40	218	718.32	470.10	3.40%	6	0.015	0.001	0.540	0.50	0.581	0.2	100.0
220.1	220	723.94	221	722.83	201.10	0.60%	6	0.015	0.000	0.000	0.00	0.234	0.0	0.0
221.1	221	722.83	1975	721.50	246.80	0.50%	6	0.015	0.003	0.550	0.01	0.231	1.1	1.2
222.1	222	723.64	221	722.83	142.20	0.60%	6	0.015	0.000	0.000	0.00	0.237	0.0	0.0
223.1	223	720.15	2365	719.25	159.70	0.60%	6	0.015	0.004	0.590	0.01	0.236	1.6	2.4
224.1	224	720.98	223	720.15	145.60	0.60%	6	0.015	0.000	0.000	0.00	0.237	0.0	0.0
225.1	225	716.39	227	715.57	199.30	0.40%	8	0.015	0.004	0.580	0.01	0.434	0.9	1.6
226.1	226	717.22	225	716.39	145.10	0.60%	8	0.015	0.000	0.000	0.00	0.512	0.0	0.0
227.1	227	715.57	216	714.99	133.60	0.40%	8	0.015	0.004	0.630	0.02	0.446	0.9	2.8
228.1	228	743.30	212	741.49	622.10	0.30%	6	0.015	0.003	0.640	0.02	0.170	1.7	4.8
229.1	229	747.50	228	743.30	515.20	0.80%	6	0.015	0.001	0.530	0.00	0.284	0.3	0.8
230.1	230	682.00	231	674.50	441.50	1.70%	12	0.015	0.383	3.510	0.27	2.601	14.7	26.7
231.1	231	674.50	232	670.88	174.90	2.10%	12	0.015	0.384	3.780	0.25	2.871	13.4	25.4
232.1	232	670.88	2027	667.80	157.90	2.00%	12	0.015	0.385	3.700	0.26	2.787	13.8	25.9
233.1	233	668.26	2027	660.23	115.90	6.90%	12	0.015	0.003	0.560	0.01	5.252	0.1	0.8
234.1	234	658.45	1970	657.88	310.30	0.20%	18	0.015	1.348	2.280	0.77	2.522	53.5	51.3
235.1	235	657.00	2015	656.42	188.50	0.30%	18	0.013	1.366	3.060	0.62	3.766	36.3	41.4
236.1	236	657.17	235	657.00	37.40	0.50%	12	0.015	0.000	0.000	0.56	1.346	0.0	56.1
237.1	237	659.02	236	657.17	288.50	0.60%	12	0.015	0.000	0.000	0.19	1.598	0.0	18.5
238.1	238	659.51	2187	659.32	46.30	0.40%	8	0.015	0.000	0.000	0.00	0.434	0.0	0.0

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
239.1	239	697.70	197	691.90	207.30	2.80%	6	0.015	0.033	1.300	0.11	0.526	6.3	21.9
240.1	240	704.75	2406	704.65	204.90	0.00%	6	0.015	0.032	0.490	0.25	0.069	45.5	50.4
241.1	241	705.55	240	704.75	266.30	0.30%	6	0.015	0.000	0.000	0.08	0.172	0.0	16.0
242.1	242	707.55	241	705.55	409.40	0.50%	6	0.015	0.000	0.000	0.00	0.220	0.0	0.0
243.1	243	711.60	244	710.49	200.50	0.60%	6	0.015	0.001	0.520	0.00	0.234	0.2	0.7
244.1	244	710.49	245	709.76	123.40	0.60%	6	0.015	0.002	0.540	0.00	0.242	0.6	1.0
245.1	245	709.76	251	708.48	167.40	0.80%	8	0.015	0.017	1.030	0.08	0.592	2.8	12.1
246.1	246	711.15	245	709.76	160.40	0.90%	8	0.015	0.014	0.950	0.07	0.630	2.3	10.1
247.1	247	714.95	246	711.15	349.30	1.10%	6	0.015	0.013	0.950	0.34	0.328	3.9	68.2
248.1	248	724.50	247	714.95	326.70	2.90%	6	0.015	0.011	0.840	0.05	0.537	2.0	10.2
249.1	249	736.98	2198	736.11	152.20	0.60%	6	0.015	0.010	0.850	0.05	0.238	4.2	10.9
250.1	250	741.68	249	736.98	363.40	1.30%	6	0.015	0.001	0.520	0.34	0.357	0.2	67.9
251.1	251	708.48	260	705.68	330.80	0.80%	8	0.015	0.114	1.840	0.21	0.623	18.3	31.9
252.1	252	715.49	251	708.48	367.20	1.90%	8	0.015	0.093	2.010	0.66	0.935	9.9	98.8
253.1	253	727.00	252	715.49	333.80	3.40%	8	0.015	0.090	1.880	0.14	1.257	7.2	20.4
254.1	254	727.00	253	727.00	264.80	0.00%	8	0.015	0.088	0.600	0.41	0.000	Infinity	61.8
255.1	255	732.91	254	727.00	173.80	3.40%	8	0.015	0.051	0.670	0.25	1.248	4.1	37.2
256.1	256	733.65	255	732.91	355.20	0.20%	8	0.015	0.026	0.550	0.23	0.309	8.4	34.2
257.1	257	734.49	256	733.65	147.60	0.60%	6	0.015	0.001	0.530	0.00	0.237	0.3	0.8
258.1	258	709.25	259	705.40	275.00	1.40%	6	0.015	0.000	0.000	0.39	0.372	0.0	77.0
259.1	259	705.40	273	700.76	485.70	1.00%	6	0.015	0.003	0.550	0.26	0.307	1.0	52.7
260.1	260	705.68	272	703.10	310.90	0.80%	8	0.015	0.128	1.920	0.22	0.617	20.7	33.6
261.1	261	710.00	272	703.10	350.80	2.00%	8	0.015	0.007	0.240	0.61	0.949	0.7	91.8
262.1	262	725.97	261	710.00	354.00	4.50%	8	0.015	0.002	0.540	0.67	1.438	0.1	100.0
263.1	263	743.75	264	736.02	524.60	1.50%	6	0.015	0.001	0.520	0.00	0.382	0.1	0.7
264.1	264	736.02	256	733.65	241.40	1.00%	6	0.015	0.024	0.980	0.12	0.311	7.8	24.8
265.1	265	739.11	264	736.02	335.00	0.90%	6	0.015	0.010	0.860	0.06	0.302	3.4	11.4
266.1	266	740.73	265	739.11	146.30	1.10%	6	0.015	0.007	0.770	0.04	0.331	2.2	8.3
267.1	267	742.01	266	740.73	113.00	1.10%	6	0.015	0.006	0.720	0.04	0.334	1.8	7.1
268.1	268	748.12	267	742.01	500.70	1.20%	6	0.015	0.004	0.680	0.03	0.347	1.2	5.9
269.1	269	749.28	268	748.12	211.40	0.50%	6	0.015	0.003	0.560	0.01	0.233	1.5	1.2
270.1	270	749.60	269	749.28	43.30	0.70%	6	0.015	0.000	0.000	0.00	0.270	0.0	0.0
271.1	271	750.94	269	749.28	311.30	0.50%	6	0.015	0.002	0.540	0.00	0.230	0.6	1.0
272.1	272	703.10	273	700.76	287.50	0.80%	8	0.015	0.146	1.990	0.47	0.611	24.0	71.2
273.1	273	700.76	333	697.30	356.20	1.00%	8	0.015	0.171	2.090	0.51	0.667	25.7	76.2
274.1	274	718.31	260	705.68	366.00	3.50%	8	0.015	0.004	0.660	0.67	1.257	0.3	100.0
275.1	275	726.65	274	718.31	332.40	2.50%	8	0.015	0.002	0.540	0.01	1.072	0.2	0.8
276.1	276	742.43	267	742.01	64.00	0.70%	6	0.015	0.000	0.000	0.00	0.255	0.0	0.0
277.1	277	742.30	266	740.73	294.90	0.50%	4	0.015	0.000	0.000	0.16	0.078	0.0	47.1
278.1	278	739.78	2110	739.45	23.20	1.40%	10	0.013	0.056	1.540	0.12	1.687	3.3	14.7

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
279.1	279	742.13	278	739.78	281.70	0.80%	8	0.013	0.000	0.400	0.24	0.713	0.0	35.7
280.1	280	743.36	556	740.60	265.80	1.00%	6	0.015	0.001	0.530	0.28	0.320	0.4	56.1
281.1	281	742.20	556	740.60	243.40	0.70%	10	0.013	0.052	1.290	0.14	1.148	4.5	17.1
282.1	282	743.67	298	743.18	135.80	0.40%	6	0.015	0.024	0.710	0.16	0.189	12.9	31.5
283.1	283	745.27	282	743.67	238.90	0.70%	6	0.015	0.024	1.100	0.12	0.257	9.5	23.1
284.1	284	746.03	283	745.27	122.10	0.60%	6	0.015	0.025	0.950	0.13	0.248	9.9	25.7
285.1	285	747.83	2111	746.57	203.20	0.60%	6	0.015	0.024	1.070	0.12	0.248	9.8	23.5
286.1	286	744.24	1972	743.26	244.20	0.40%	8	0.013	0.001	0.520	0.00	0.495	0.1	0.5
287.1	287	745.00	288	744.26	156.20	0.50%	8	0.013	0.001	0.520	0.00	0.538	0.1	0.5
288.1	288	744.26	1972	743.26	249.50	0.40%	8	0.013	0.023	0.740	0.23	0.494	4.6	34.3
289.1	289	749.33	288	744.26	334.30	1.50%	8	0.013	0.020	1.020	0.07	0.962	2.1	10.9
290.1	290	754.35	291	751.78	260.50	1.00%	8	0.013	0.018	1.040	0.34	0.776	2.4	50.4
291.1	291	751.78	289	749.33	248.90	1.00%	8	0.013	0.020	1.080	0.33	0.775	2.6	49.5
292.1	292	757.41	290	754.35	309.60	1.00%	6	0.015	0.018	1.040	0.10	0.312	5.7	19.3
293.1	293	758.48	292	757.41	189.20	0.60%	6	0.015	0.014	0.940	0.07	0.236	5.8	13.3
294.1	294	759.94	297	759.03	182.10	0.50%	6	0.015	0.000	0.290	0.00	0.222	0.1	0.5
295.1	295	760.93	297	759.03	146.40	1.30%	6	0.015	0.002	0.540	0.00	0.358	0.4	1.0
296.1	296	764.31	295	760.93	252.10	1.30%	6	0.015	0.001	0.520	0.34	0.364	0.1	68.3
297.1	297	759.03	1973	758.49	331.70	0.20%	6	0.015	0.002	0.620	0.02	0.127	1.7	4.2
298.1	298	743.18	281	742.20	243.90	0.40%	8	0.013	0.025	0.840	0.13	0.495	5.1	19.0
299.1	299	749.72	285	747.83	252.00	0.70%	6	0.015	0.024	0.800	0.33	0.272	8.9	66.4
300.1	300	751.74	299	749.72	232.00	0.90%	6	0.015	0.024	1.060	0.12	0.293	8.2	23.4
301.1	301	755.36	300	751.80	712.00	0.50%	6	0.015	0.000	0.000	0.00	0.222	0.0	0.0
302.1	302	753.30	300	751.74	190.10	0.80%	6	0.015	0.010	0.880	0.06	0.285	3.6	12.1
303.1	303	754.32	302	753.30	163.20	0.60%	6	0.015	0.002	0.540	0.01	0.249	0.7	1.0
304.1	304	755.74	303	754.32	263.50	0.50%	6	0.015	0.002	0.540	0.15	0.231	0.7	29.4
305.1	305	741.91	306	739.80	421.50	0.50%	6	0.015	0.001	0.520	0.00	0.222	0.3	0.8
306.1	306	739.70	313	738.00	319.70	0.50%	6	0.015	0.003	0.580	0.01	0.229	1.3	2.3
307.1	307	750.80	306	739.70	120.60	9.20%	6	0.015	0.000	0.000	0.00	0.954	0.0	0.0
308.1	308	738.55	309	737.86	117.20	0.60%	6	0.015	0.000	0.000	0.00	0.241	0.0	0.0
309.1	309	737.86	311	733.94	484.30	0.80%	6	0.015	0.004	0.420	0.28	0.283	1.2	55.2
310.1	310	739.04	323	738.35	117.70	0.60%	6	0.015	0.000	0.000	0.00	0.241	0.0	0.0
311.1	311	733.94	329	724.10	244.60	4.00%	6	0.015	0.207	3.150	0.21	0.630	32.9	42.0
312.1	312	736.00	311	733.94	187.30	1.10%	6	0.015	0.202	2.510	0.30	0.330	61.3	60.5
313.1	313	738.00	312	736.00	57.00	3.50%	6	0.015	0.203	3.110	0.21	0.589	34.4	41.7
314.1	314	741.43	313	738.00	145.80	2.40%	6	0.015	0.199	3.220	0.24	0.482	41.2	47.5
315.1	315	742.63	314	741.43	221.20	0.50%	6	0.013	0.000	0.000	0.00	0.267	0.0	0.0
316.1	316	742.47	2364	742.40	13.90	0.50%	6	0.015	0.193	2.220	0.32	0.223	86.8	64.9
317.1	317	768.00	320	757.47	60.90	17.30%	6	0.013	0.002	0.540	0.01	1.507	0.1	1.0
318.1	318	769.36	317	768.00	257.10	0.50%	6	0.013	0.002	0.540	0.14	0.264	0.7	28.2

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
319.1	319	769.92	317	768.00	163.90	1.20%	8	0.013	0.000	0.000	0.00	0.845	0.0	0.0
320.1	320	757.47	322	757.47	183.10	0.00%	6	0.013	0.145	1.140	0.50	0.000	Infinity	100.0
321.1	321	770.16	319	769.92	227.20	0.10%	6	0.015	0.000	0.000	0.00	0.102	0.0	0.0
322.1	322	757.47	316	742.47	468.80	3.20%	6	0.013	0.146	2.230	0.50	0.649	22.5	100.0
323.1	323	738.35	309	737.86	78.50	0.60%	6	0.015	0.002	0.580	0.01	0.248	0.9	2.6
324.1	324	726.86	325	725.87	177.50	0.60%	6	0.015	0.001	0.530	0.00	0.235	0.4	0.8
325.1	325	725.87	329	724.10	200.30	0.90%	6	0.015	0.009	0.070	0.50	0.295	2.9	100.0
326.1	326	727.19	325	725.87	244.60	0.50%	6	0.015	0.002	0.550	0.01	0.231	1.0	1.1
327.1	327	727.84	326	727.19	110.80	0.60%	6	0.015	0.001	0.530	0.00	0.241	0.5	0.9
328.1	328	728.29	327	727.84	69.50	0.60%	6	0.015	0.001	0.530	0.00	0.253	0.4	0.8
329.1	329	724.10	330	721.42	711.10	0.40%	6	0.015	0.221	1.740	0.50	0.193	114.7	100.0
330.1	330	721.42	2060	721.26	12.00	1.30%	6	0.015	0.239	2.840	0.31	0.364	65.6	62.8
331.1	331	710.76	332	705.13	321.60	1.80%	6	0.015	0.246	3.190	0.29	0.416	59.1	58.4
332.1	332	705.13	333	697.30	265.70	2.90%	6	0.015	0.250	3.690	0.50	0.540	46.3	100.0
333.1	333	697.30	2125	697.05	75.00	0.30%	8	0.015	0.423	2.250	0.52	0.391	108.1	77.7
335.1	335	697.04	1971	696.03	269.00	0.40%	8	0.015	0.073	1.130	0.32	0.415	17.6	48.0
336.1	336	697.88	335	697.04	217.50	0.40%	8	0.015	0.000	0.440	0.00	0.421	0.1	0.5
337.1	337	707.55	347	706.19	308.30	0.40%	8	0.015	0.068	1.180	0.20	0.450	15.1	30.1
338.1	338	709.20	337	707.55	455.90	0.40%	8	0.015	0.068	1.090	0.31	0.407	16.6	45.8
339.1	339	729.95	338	709.20	482.00	4.30%	8	0.015	0.019	0.950	0.67	1.404	1.4	100.0
340.1	340	731.32	339	729.95	380.20	0.40%	8	0.015	0.001	0.530	0.10	0.406	0.3	15.3
341.1	341	731.91	340	731.32	144.80	0.40%	8	0.015	0.000	0.000	0.00	0.432	0.0	0.0
342.1	342	730.53	339	729.95	116.00	0.50%	6	0.015	0.000	0.000	0.00	0.222	0.0	0.0
343.1	343	737.44	312	736.00	185.30	0.80%	6	0.015	0.000	0.000	0.00	0.277	0.0	0.0
344.1	344	696.05	334	695.20	299.30	0.30%	10	0.015	0.422	1.910	0.50	0.654	64.6	60.2
345.1	345	699.80	335	697.04	531.90	0.50%	6	0.015	0.000	0.000	0.00	0.226	0.0	0.0
346.1	346	698.52	334	695.20	312.60	1.10%	8	0.015	0.387	3.040	0.37	0.698	55.4	55.0
347.1	347	706.19	2124	705.59	60.00	1.00%	8	0.015	0.294	2.740	0.32	0.677	43.4	48.0
348.1	348	710.86	347	706.19	469.50	1.00%	8	0.015	0.123	2.010	0.47	0.675	18.1	70.4
349.1	349	711.19	348	710.86	45.40	0.70%	6	0.015	0.000	0.000	0.05	0.268	0.0	9.9
350.1	350	712.18	349	711.19	177.40	0.60%	6	0.015	0.000	0.000	0.00	0.235	0.0	0.0
351.1	351	707.50	352	701.65	576.60	1.00%	6	0.015	0.000	0.000	0.27	0.317	0.0	53.2
352.1	352	701.65	346	698.52	335.60	0.90%	6	0.015	0.065	1.690	0.17	0.304	21.4	34.2
353.1	353	704.86	352	701.65	340.70	0.90%	6	0.015	0.043	1.270	0.16	0.305	14.2	31.3
354.1	354	709.90	353	704.86	577.80	0.90%	6	0.015	0.000	0.000	0.23	0.294	0.0	45.8
355.1	355	697.98	356	696.75	216.90	0.60%	6	0.015	0.005	0.590	0.01	0.237	2.0	2.0
356.1	356	696.75	357	691.45	358.80	1.50%	6	0.015	0.007	0.740	0.42	0.382	1.8	83.1
357.1	357	691.45	376	689.53	401.30	0.50%	6	0.015	0.026	0.920	0.13	0.217	11.8	27.0
358.1	358	693.13	357	691.45	321.60	0.50%	6	0.015	0.016	0.730	0.12	0.227	7.2	23.2
359.1	359	695.37	358	693.13	449.70	0.50%	6	0.015	0.015	0.830	0.22	0.222	6.6	44.5

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
360.1	360	699.80	359	695.37	361.10	1.20%	6	0.015	0.009	0.830	0.37	0.348	2.7	73.5
361.1	361	701.25	362	699.65	311.80	0.50%	6	0.015	0.000	0.000	0.00	0.225	0.0	0.0
362.1	362	699.65	355	697.98	315.30	0.50%	6	0.015	0.002	0.670	0.03	0.229	1.0	6.1
363.1	363	702.17	360	699.80	453.00	0.50%	6	0.015	0.000	0.000	0.13	0.227	0.0	26.3
364.1	364	711.75	365	706.80	574.20	0.90%	6	0.015	0.000	0.000	0.23	0.292	0.0	45.0
365.1	365	706.80	353	704.86	337.30	0.60%	6	0.015	0.020	0.750	0.13	0.238	8.3	26.1
366.1	366	714.02	365	706.80	183.30	3.90%	6	0.015	0.001	0.530	0.00	0.624	0.2	0.9
367.1	367	715.47	366	714.02	270.30	0.50%	6	0.015	0.000	0.000	0.15	0.230	0.0	29.0
368.1	368	713.41	1298	713.02	85.40	0.50%	8	0.015	0.055	1.070	0.19	0.457	12.1	27.9
369.1	369	714.27	374	713.84	93.60	0.50%	8	0.015	0.054	1.060	0.18	0.459	11.7	27.6
370.1	370	716.36	369	714.27	114.60	1.80%	8	0.015	0.035	1.330	0.11	0.914	3.9	16.8
371.1	371	718.97	370	716.36	149.00	1.80%	8	0.015	0.035	1.340	0.11	0.896	3.9	17.0
372.1	372	722.61	373	719.66	515.00	0.60%	8	0.015	0.010	0.850	0.07	0.512	2.0	10.1
373.1	373	719.66	371	718.97	124.70	0.60%	8	0.015	0.029	0.840	0.14	0.504	5.7	20.7
374.1	374	713.84	554	713.61	50.60	0.50%	8	0.015	0.054	1.060	0.18	0.456	11.8	27.6
375.1	375	692.37	376	689.53	411.30	0.70%	10	0.015	0.876	3.180	0.61	1.020	85.9	72.9
376.1	376	689.53	378	685.91	132.20	2.70%	12	0.015	0.911	4.960	0.39	3.302	27.6	39.1
377.1	377	695.23	376	689.53	453.20	1.30%	6	0.015	0.002	0.540	0.32	0.353	0.5	64.4
378.1	378	685.91	379	684.27	204.40	0.80%	12	0.015	0.948	3.510	0.52	1.788	53.0	52.5
379.1	379	684.27	2025	682.06	275.60	0.80%	12	0.015	0.948	3.510	0.75	1.787	53.0	74.6
380.1	380	671.70	381	670.19	413.50	0.40%	8	0.015	0.000	0.000	0.00	0.409	0.0	0.0
381.1	381	670.19	233	668.26	539.10	0.40%	8	0.015	0.002	0.540	0.01	0.405	0.4	0.8
382.1	382	649.00	384	648.35	129.30	0.50%	8	0.012	0.109	1.770	0.21	0.600	18.2	31.8
383.1	383	655.60	382	649.00	122.70	5.40%	8	0.012	0.029	1.100	0.08	1.962	1.5	11.3
384.1	384	648.35	385	647.46	178.50	0.50%	8	0.012	0.110	1.770	0.21	0.597	18.4	32.0
385.1	385	647.46	LS_TP1	647.41	15.80	0.30%	8	0.012	0.111	1.620	0.23	0.493	22.6	34.4
386.1	386	658.90	383	655.60	405.70	0.80%	8	0.012	0.025	1.190	0.10	0.763	3.3	14.9
387.1	387	663.30	386	658.90	489.50	0.90%	8	0.012	0.021	1.090	0.33	0.802	2.6	49.6
388.1	388	665.59	387	663.30	254.70	0.90%	8	0.012	0.000	0.000	0.23	0.802	0.0	34.4
389.1	389	655.50	382	649.00	340.70	1.90%	8	0.012	0.038	1.320	0.10	1.169	3.3	15.7
390.1	390	656.21	389	655.50	141.20	0.50%	8	0.012	0.001	0.530	0.00	0.600	0.2	0.7
391.1	391	657.40	389	655.50	380.70	0.50%	8	0.012	0.002	0.540	0.14	0.598	0.2	21.1
392.1	392	659.27	389	655.50	289.80	1.30%	8	0.012	0.031	1.270	0.48	0.965	3.2	72.5
393.1	393	662.46	392	659.27	290.10	1.10%	8	0.012	0.006	0.670	0.34	0.887	0.7	51.4
394.1	394	664.54	393	662.46	174.60	1.20%	8	0.012	0.002	0.540	0.01	0.924	0.2	0.8
395.1	395	661.39	392	659.27	265.50	0.80%	8	0.012	0.021	1.120	0.30	0.756	2.8	45.5
396.1	396	662.20	395	661.39	150.30	0.50%	8	0.012	0.020	1.000	0.10	0.621	3.2	14.3
397.1	397	663.70	396	662.20	114.50	1.30%	8	0.012	0.020	0.980	0.07	0.968	2.1	9.8
398.1	398	664.86	397	663.70	219.00	0.50%	8	0.012	0.001	0.530	0.00	0.616	0.1	0.6
399.1	399	665.34	398	664.86	96.50	0.50%	8	0.012	0.000	0.510	0.00	0.597	0.1	0.5

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
400.1	400	664.64	397	663.70	312.80	0.30%	8	0.012	0.002	0.640	0.03	0.464	0.5	3.8
401.1	401	665.22	397	663.70	284.20	0.50%	8	0.012	0.012	0.920	0.22	0.619	2.0	32.5
402.1	402	666.70	401	665.22	298.80	0.50%	8	0.012	0.001	0.530	0.00	0.596	0.2	0.7
403.1	403	666.69	401	665.22	296.60	0.50%	8	0.012	0.008	0.830	0.20	0.596	1.4	30.0
404.1	404	667.92	403	666.69	245.50	0.50%	8	0.012	0.004	0.640	0.02	0.599	0.7	3.2
405.1	405	668.98	404	667.92	104.70	1.00%	8	0.012	0.003	0.580	0.01	0.851	0.4	1.6
406.1	406	670.70	405	668.98	349.20	0.50%	8	0.012	0.000	0.380	0.13	0.594	0.0	18.9
407.1	407	669.70	403	666.69	442.10	0.70%	8	0.012	0.000	0.380	0.00	0.698	0.0	0.4
408.1	408	666.50	387	663.30	292.70	1.10%	8	0.012	0.019	1.010	0.39	0.885	2.1	58.9
409.1	409	668.64	408	666.50	193.80	1.10%	8	0.012	0.005	0.620	0.02	0.889	0.5	2.6
410.1	410	671.08	409	668.64	154.80	1.60%	8	0.012	0.004	0.600	0.01	1.062	0.4	1.9
411.1	411	671.25	410	671.08	223.60	0.10%	8	0.012	0.003	0.640	0.02	0.233	1.1	3.7
412.1	412	672.50	411	671.25	256.10	0.50%	8	0.012	0.000	0.000	0.13	0.591	0.0	18.8
413.1	413	674.03	408	666.50	503.00	1.50%	8	0.012	0.008	0.690	0.02	1.035	0.8	3.7
414.1	414	676.37	413	674.03	232.50	1.00%	8	0.012	0.006	0.670	0.02	0.849	0.7	3.6
415.1	415	678.92	414	676.37	179.90	1.40%	8	0.012	0.005	0.610	0.02	1.007	0.5	2.3
416.1	416	683.72	415	678.92	550.80	0.90%	8	0.012	0.000	0.510	0.22	0.790	0.0	33.2
417.1	417	646.15	1929	646.07	179.70	0.00%	18	0.011	1.865	2.900	0.82	1.693	110.2	54.9
418.1	418	648.71	417	646.15	221.00	1.20%	21	0.011	1.720	5.080	0.47	13.025	13.2	27.0
419.1	419	649.70	418	648.71	197.30	0.50%	21	0.011	1.720	4.260	0.54	8.572	20.1	30.6
420.1	420	652.80	419	649.70	294.00	1.10%	6	0.012	0.007	0.760	0.35	0.403	1.8	70.4
421.1	421	655.48	420	652.80	363.40	0.70%	6	0.012	0.004	0.660	0.22	0.337	1.2	43.5
422.1	422	657.91	421	655.48	369.30	0.70%	6	0.012	0.001	0.530	0.18	0.319	0.4	35.6
423.1	423	647.98	417	646.15	261.50	0.70%	8	0.012	0.143	2.010	0.42	0.708	20.2	62.8
424.1	424	649.88	423	647.98	381.90	0.50%	8	0.012	0.140	1.940	0.37	0.597	23.5	56.0
425.1	425	651.91	424	649.88	396.00	0.50%	8	0.012	0.138	1.950	0.38	0.606	22.8	56.9
426.1	426	658.00	425	651.91	218.20	2.80%	6	0.012	0.000	0.000	0.00	0.656	0.0	0.0
427.1	427	653.12	861	652.16	194.40	0.50%	8	0.012	0.136	1.920	0.23	0.595	22.9	35.2
428.1	428	652.29	2363	650.81	177.40	0.80%	21	0.011	1.712	5.110	0.47	11.055	15.5	26.8
429.1	429	653.63	428	652.29	159.80	0.80%	21	0.011	1.662	5.080	0.46	11.081	15.0	26.3
430.1	430	656.17	429	653.63	487.60	0.50%	21	0.011	1.662	4.280	0.66	8.735	19.0	37.8
431.1	431	657.77	430	656.17	299.70	0.50%	21	0.011	1.662	4.320	0.52	8.842	18.8	29.6
432.1	432	660.27	431	657.77	459.00	0.50%	21	0.011	1.658	4.350	0.65	8.931	18.6	37.3
433.1	433	661.23	432	660.27	172.20	0.60%	21	0.011	1.655	4.380	0.51	9.037	18.3	29.2
434.1	434	653.28	428	652.29	147.10	0.70%	8	0.012	0.050	1.240	0.07	0.694	7.2	10.6
435.1	435	654.70	434	653.28	213.70	0.70%	8	0.012	0.049	1.350	0.14	0.690	7.0	21.6
436.1	436	656.20	435	654.70	300.90	0.50%	8	0.012	0.017	1.040	0.08	0.597	2.9	12.0
437.1	437	656.70	436	656.20	73.00	0.70%	6	0.012	0.010	0.890	0.06	0.325	3.2	12.5
438.1	438	659.14	437	656.70	426.20	0.60%	6	0.012	0.006	0.750	0.04	0.297	2.2	8.2
439.1	439	660.34	438	659.14	247.20	0.50%	6	0.012	0.005	0.630	0.02	0.274	1.7	3.8

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
440.1	440	661.45	439	660.34	216.30	0.50%	6	0.012	0.003	0.600	0.02	0.281	1.0	3.1
441.1	441	664.03	440	661.45	309.20	0.80%	6	0.012	0.000	0.410	0.00	0.359	0.1	0.6
442.1	442	658.35	436	656.20	173.00	1.20%	6	0.012	0.006	0.710	0.03	0.438	1.5	6.2
443.1	443	662.00	442	658.35	549.50	0.70%	6	0.012	0.002	0.540	0.17	0.320	0.6	34.2
444.1	444	659.20	442	658.35	220.50	0.40%	6	0.012	0.000	0.270	0.00	0.244	0.1	0.5
445.1	445	656.58	435	654.70	174.40	1.10%	8	0.012	0.031	1.270	0.11	0.879	3.5	15.9
446.1	446	658.32	445	656.58	348.00	0.50%	8	0.012	0.027	0.910	0.25	0.598	4.5	37.6
447.1	447	660.65	446	658.32	480.00	0.50%	8	0.012	0.023	0.900	0.24	0.590	4.0	36.6
448.1	448	663.00	447	660.65	382.30	0.60%	8	0.012	0.020	1.090	0.26	0.663	3.0	38.8
449.1	449	665.31	448	663.00	412.20	0.60%	8	0.012	0.015	0.970	0.07	0.633	2.4	10.8
450.1	450	665.31	449	665.31	103.90	0.00%	8	0.012	0.015	0.280	0.19	0.000	Infinity	28.3
451.1	451	666.45	450	665.31	100.10	1.10%	6	0.012	0.002	0.540	0.00	0.419	0.3	1.0
452.1	452	667.17	451	666.45	146.10	0.50%	6	0.012	0.000	0.000	0.00	0.276	0.0	0.0
453.1	453	666.79	2078	666.37	332.70	0.10%	21	0.011	1.648	2.740	0.72	4.300	38.3	41.0
454.1	454	671.98	455	671.17	140.30	0.60%	8	0.012	0.000	0.000	0.00	0.643	0.0	0.0
455.1	455	671.17	456	668.59	435.90	0.60%	8	0.012	0.003	0.620	0.02	0.651	0.5	2.8
456.1	456	668.59	457	667.14	242.60	0.60%	8	0.012	0.007	0.740	0.04	0.654	1.1	5.4
457.1	457	667.14	450	665.31	199.50	0.90%	8	0.012	0.012	0.610	0.09	0.810	1.5	14.1
458.1	458	680.85	2127	680.27	80.00	0.70%	8	0.011	0.044	1.400	0.13	0.786	5.6	19.6
459.1	459	661.85	460	660.69	292.30	0.40%	8	0.012	0.084	1.450	0.32	0.533	15.8	47.8
460.1	460	660.69	464	660.30	202.30	0.20%	8	0.012	0.094	1.180	0.26	0.372	25.4	38.5
461.1	461	663.41	460	660.69	544.10	0.50%	8	0.012	0.001	0.530	0.00	0.598	0.2	0.7
462.1	462	659.86	465	658.77	219.00	0.50%	8	0.012	0.101	1.720	0.20	0.597	16.9	30.7
463.1	463	662.10	462	659.86	515.10	0.40%	8	0.012	0.001	0.530	0.00	0.558	0.2	0.7
464.1	464	660.30	462	659.86	85.90	0.50%	8	0.012	0.095	1.680	0.20	0.605	15.6	29.8
465.1	465	658.77	466	658.27	99.30	0.50%	8	0.012	0.101	1.710	0.21	0.600	16.8	30.8
466.1	466	658.27	467	656.89	343.50	0.40%	8	0.012	0.102	1.580	0.22	0.536	19.1	33.0
467.1	467	656.89	1202	656.13	196.80	0.40%	8	0.012	0.105	1.590	0.22	0.526	20.0	33.4
468.1	468	662.83	459	661.85	242.80	0.40%	8	0.012	0.058	1.280	0.17	0.538	10.8	25.5
469.1	469	671.89	1223	665.37	634.70	1.00%	8	0.012	0.001	0.530	0.00	0.858	0.2	0.7
470.1	470	666.83	468	662.83	409.20	1.00%	8	0.012	0.035	1.320	0.12	0.837	4.2	17.4
471.1	471	669.96	470	666.83	214.10	1.50%	8	0.012	0.033	1.230	0.10	1.023	3.2	14.3
472.1	472	672.82	471	669.96	238.40	1.20%	8	0.012	0.032	1.240	0.10	0.927	3.4	14.8
473.1	473	675.32	472	672.82	451.60	0.60%	8	0.012	0.025	1.000	0.25	0.630	4.0	37.7
474.1	474	680.41	473	675.32	510.90	1.00%	8	0.012	0.002	0.540	0.01	0.845	0.2	0.8
475.1	475	719.96	476	716.53	666.30	0.50%	6	0.015	0.001	0.520	0.14	0.226	0.3	27.2
476.1	476	716.53	369	714.27	435.00	0.50%	6	0.015	0.016	0.810	0.11	0.227	7.1	21.2
477.1	477	723.81	371	718.97	275.60	1.80%	6	0.015	0.005	0.690	0.50	0.417	1.1	100.0
478.1	478	732.32	477	723.81	485.60	1.80%	6	0.015	0.003	0.640	0.50	0.416	0.8	99.2
479.1	479	736.56	478	732.32	469.60	0.90%	6	0.015	0.002	0.540	0.24	0.299	0.5	48.1

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
480.1	480	742.67	479	736.56	402.50	1.50%	6	0.015	0.000	0.320	0.00	0.387	0.1	0.5
481.1	481	725.78	482	724.45	266.00	0.50%	8	0.015	0.009	0.720	0.20	0.479	1.9	30.4
482.1	482	724.45	372	722.61	368.70	0.50%	8	0.015	0.009	0.820	0.18	0.478	1.9	27.2
483.1	483	726.74	481	725.78	171.70	0.60%	6	0.015	0.004	0.640	0.02	0.235	1.9	4.2
484.1	484	728.60	483	726.74	372.40	0.50%	6	0.015	0.000	0.520	0.14	0.222	0.2	27.3
485.1	485	729.49	486	726.86	506.90	0.50%	6	0.015	0.000	0.520	0.00	0.226	0.2	0.7
486.1	486	726.86	481	725.78	195.30	0.60%	8	0.015	0.005	0.600	0.01	0.503	0.9	1.9
487.1	487	761.54	488	760.16	376.80	0.40%	8	0.012	0.001	0.530	0.10	0.512	0.2	15.4
488.1	488	760.16	489	759.42	187.90	0.40%	8	0.012	0.005	0.680	0.03	0.531	1.0	4.1
489.1	489	759.42	490	758.65	198.20	0.40%	8	0.012	0.008	0.730	0.04	0.527	1.4	5.3
490.1	490	758.65	491	757.46	321.60	0.40%	8	0.012	0.010	0.850	0.07	0.515	1.9	9.8
491.1	491	757.46	494	756.75	179.60	0.40%	8	0.012	0.012	0.910	0.06	0.532	2.3	9.5
492.1	492	758.13	491	757.46	166.70	0.40%	8	0.012	0.001	0.530	0.00	0.536	0.2	0.7
493.1	493	758.63	492	758.13	117.40	0.40%	8	0.012	0.000	0.500	0.00	0.552	0.1	0.5
494.1	494	756.75	495	756.08	166.80	0.40%	8	0.012	0.015	0.870	0.09	0.536	2.8	12.8
495.1	495	756.08	496	755.49	143.20	0.40%	8	0.012	0.030	0.880	0.14	0.543	5.6	20.9
496.1	496	755.49	497	754.63	223.00	0.40%	8	0.012	0.032	0.900	0.14	0.525	6.0	21.2
497.1	497	754.63	498	753.55	286.90	0.40%	8	0.012	0.035	0.900	0.26	0.519	6.7	38.9
498.1	498	753.55	524	753.19	127.90	0.30%	12	0.012	0.041	0.870	0.15	1.323	3.1	14.9
499.1	499	753.94	498	753.55	143.60	0.30%	12	0.012	0.001	0.530	0.00	1.300	0.1	0.5
500.1	500	754.30	499	753.94	131.60	0.30%	12	0.012	0.000	0.140	0.00	1.305	0.0	0.2
501.1	501	757.05	495	756.08	255.90	0.40%	8	0.012	0.012	0.870	0.17	0.521	2.2	25.5
502.1	502	757.55	501	757.05	146.90	0.30%	8	0.012	0.010	0.870	0.06	0.494	2.1	8.6
503.1	503	758.58	502	757.55	273.20	0.40%	8	0.012	0.006	0.790	0.15	0.520	1.2	22.6
504.1	504	759.38	503	758.58	205.40	0.40%	8	0.012	0.005	0.640	0.02	0.528	0.9	3.0
505.1	505	759.78	504	759.38	88.40	0.50%	8	0.012	0.004	0.660	0.03	0.569	0.8	3.8
506.1	506	760.54	505	759.78	193.60	0.40%	8	0.012	0.000	0.500	0.00	0.530	0.1	0.5
507.1	507	761.43	505	759.78	456.70	0.40%	8	0.012	0.000	0.000	0.09	0.509	0.0	13.7
508.1	508	759.47	509	759.17	59.10	0.50%	6	0.012	0.002	0.590	0.02	0.280	0.7	3.1
509.1	509	759.17	510	758.76	89.90	0.50%	8	0.012	0.002	0.590	0.01	0.571	0.4	2.2
510.1	510	758.76	512	756.78	551.70	0.40%	8	0.012	0.007	0.760	0.13	0.507	1.3	19.8
511.1	511	759.06	510	758.76	57.60	0.50%	8	0.012	0.004	0.650	0.02	0.611	0.6	3.7
512.1	512	756.78	513	755.64	306.90	0.40%	8	0.012	0.010	0.870	0.07	0.516	2.0	9.9
513.1	513	755.64	518	754.64	294.60	0.30%	8	0.012	0.014	0.960	0.17	0.493	2.8	25.5
514.1	514	756.17	513	755.64	127.00	0.40%	8	0.012	0.001	0.520	0.00	0.547	0.1	0.6
515.1	515	757.48	516	756.60	230.50	0.40%	8	0.012	0.000	0.330	0.00	0.523	0.0	0.4
516.1	516	756.60	517	755.66	245.70	0.40%	8	0.012	0.026	0.900	0.12	0.523	5.0	18.7
517.1	517	755.66	518	754.64	299.70	0.30%	8	0.012	0.028	0.760	0.14	0.494	5.6	21.7
518.1	518	754.64	519	753.52	299.70	0.40%	8	0.012	0.046	1.060	0.17	0.517	9.0	24.8
519.1	519	753.52	521	753.01	150.30	0.30%	8	0.012	0.054	1.120	0.18	0.493	10.9	26.4

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
520.1	520	755.07	519	753.52	425.70	0.40%	8	0.012	0.001	0.520	0.00	0.511	0.1	0.6
521.1	521	753.01	522	752.26	191.70	0.40%	8	0.012	0.054	1.180	0.17	0.529	10.3	25.8
522.1	522	752.26	2062	752.00	81.30	0.30%	12	0.012	0.113	1.470	0.21	1.411	8.0	20.9
523.1	523	752.73	522	752.26	186.10	0.30%	12	0.012	0.050	0.940	0.16	1.254	4.0	16.2
524.1	524	753.19	523	752.73	181.40	0.30%	12	0.012	0.042	0.860	0.15	1.256	3.4	15.3
526.1	526	757.98	516	756.60	377.40	0.40%	8	0.012	0.022	0.850	0.21	0.512	4.2	31.7
527.1	527	764.56	528	758.33	63.10	9.90%	8	0.012	0.017	0.840	0.04	2.659	0.6	6.4
528.1	528	758.33	526	757.98	74.40	0.50%	8	0.012	0.021	0.930	0.10	0.580	3.6	15.7
529.1	529	778.00	530	768.40	206.60	4.60%	8	0.012	0.001	0.520	0.00	1.824	0.0	0.5
530.1	530	768.40	531	765.40	66.40	4.50%	8	0.012	0.003	0.580	0.01	1.799	0.2	1.6
531.1	531	765.40	532	762.80	145.10	1.80%	8	0.012	0.003	0.620	0.02	1.133	0.3	2.7
532.1	532	762.80	533	760.84	371.30	0.50%	8	0.012	0.006	0.720	0.17	0.615	1.0	26.2
533.1	533	760.84	541	757.16	332.50	1.10%	8	0.012	0.022	1.100	0.08	0.890	2.5	12.7
534.1	534	776.58	533	760.84	259.80	6.10%	8	0.012	0.001	0.530	0.67	2.082	0.1	100.0
535.1	535	780.86	534	776.58	108.30	4.00%	8	0.012	0.000	0.500	0.00	1.682	0.0	0.5
536.1	536	784.00	537	778.00	125.40	4.80%	8	0.012	0.001	0.520	0.00	1.851	0.0	0.6
537.1	537	778.00	538	775.00	129.50	2.30%	8	0.012	0.003	0.590	0.01	1.288	0.2	2.0
538.1	538	775.00	539	768.65	289.80	2.20%	8	0.012	0.004	0.580	0.64	1.252	0.3	96.7
539.1	539	768.65	533	760.84	320.40	2.40%	8	0.012	0.007	0.650	0.02	1.321	0.5	3.0
540.1	540	758.97	541	757.16	185.60	1.00%	8	0.012	0.001	0.530	0.00	0.835	0.1	0.6
541.1	541	757.16	548	743.98	466.30	2.80%	8	0.012	0.027	1.120	0.67	1.422	1.9	100.0
542.1	542	749.50	543	748.45	82.10	1.30%	8	0.012	0.001	0.530	0.00	0.957	0.1	0.7
543.1	543	748.45	544	747.79	133.40	0.50%	8	0.012	0.002	0.550	0.01	0.595	0.3	1.2
544.1	544	747.79	545	742.52	208.20	2.50%	8	0.012	0.003	0.580	0.01	1.346	0.2	1.6
545.1	545	742.52	552	738.40	189.90	2.20%	8	0.012	0.004	0.670	0.03	1.246	0.3	4.0
546.1	546	738.08	551	735.42	78.90	3.40%	8	0.012	0.034	1.190	0.09	1.553	2.2	12.9
547.1	547	742.22	546	738.08	97.60	4.20%	8	0.012	0.033	1.160	0.08	1.743	1.9	12.2
548.1	548	743.98	547	742.22	98.00	1.80%	8	0.012	0.032	1.240	0.10	1.134	2.8	14.8
549.1	549	728.76	1588	727.30	303.50	0.50%	10	0.012	0.065	1.410	0.16	1.064	6.1	18.9
550.1	550	730.90	1587	729.99	34.60	2.60%	8	0.012	0.045	1.350	0.10	1.371	3.3	15.0
551.1	551	735.42	550	730.90	354.70	1.30%	8	0.012	0.041	1.390	0.44	0.955	4.2	65.7
552.1	552	738.40	551	735.42	163.70	1.80%	8	0.012	0.005	0.670	0.03	1.142	0.5	3.8
553.1	553	742.47	1139	741.73	120.90	0.60%	6	0.015	0.030	0.890	0.16	0.246	12.2	31.0
554.1	554	713.61	368	713.41	43.20	0.50%	8	0.015	0.054	1.080	0.18	0.460	11.8	27.4
555.1	555	716.96	554	713.61	129.00	2.60%	6	0.015	0.000	0.470	0.00	0.507	0.1	0.6
556.1	556	740.60	278	739.78	104.90	0.80%	10	0.013	0.054	1.390	0.14	1.252	4.3	16.7
557.1	557	697.38	359	695.37	390.50	0.50%	6	0.015	0.003	0.580	0.16	0.226	1.2	31.0
558.1	558	698.73	557	697.38	271.90	0.50%	6	0.015	0.001	0.530	0.14	0.222	0.4	27.8
559.1	559	718.63	2367	718.23	59.60	0.70%	6	0.015	0.000	0.000	0.00	0.258	0.0	0.0
560.1	560	688.08	567	687.05	314.50	0.30%	10	0.011	0.033	0.860	0.14	0.958	3.4	16.4

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
561.1	561	701.29	562	692.37	424.00	2.10%	8	0.011	0.000	0.000	0.00	1.339	0.0	0.0
562.1	562	692.37	568	674.85	398.50	4.40%	8	0.011	0.002	0.560	0.01	1.935	0.1	1.3
563.1	563	695.35	566	693.50	504.50	0.40%	8	0.011	0.001	0.530	0.00	0.559	0.2	0.7
564.1	564	703.55	565	700.89	516.40	0.50%	8	0.011	0.001	0.530	0.00	0.662	0.2	0.7
565.1	565	700.89	566	693.50	290.20	2.50%	8	0.011	0.003	0.610	0.67	1.473	0.2	100.0
566.1	566	693.50	560	688.08	290.80	1.90%	8	0.011	0.007	0.670	0.57	1.260	0.5	84.8
567.1	567	687.05	570	686.18	260.60	0.30%	10	0.011	0.034	0.890	0.22	0.967	3.5	26.9
568.1	568	674.85	572	673.17	348.00	0.50%	12	0.011	0.008	0.760	0.16	1.891	0.4	15.8
569.1	569	695.94	574	687.92	396.20	2.00%	8	0.011	0.002	0.560	0.58	1.313	0.2	87.3
570.1	570	686.18	571	685.27	273.70	0.30%	10	0.011	0.035	0.910	0.23	0.965	3.7	27.7
571.1	571	685.27	572	673.17	399.10	3.00%	10	0.011	0.037	1.210	0.09	2.914	1.3	10.3
572.1	572	673.17	575	672.20	292.50	0.30%	12	0.011	0.048	1.050	0.24	1.567	3.0	24.2
573.1	573	685.55	585	676.19	249.20	3.80%	8	0.011	0.001	0.530	0.67	1.789	0.1	100.0
574.1	574	687.92	575	672.20	400.80	3.90%	8	0.011	0.004	0.600	0.01	1.828	0.2	2.0
575.1	575	672.20	576	671.12	324.30	0.30%	12	0.011	0.055	1.130	0.15	1.570	3.5	15.2
576.1	576	671.12	577	670.17	290.00	0.30%	12	0.011	0.058	1.160	0.25	1.557	3.7	25.1
577.1	577	670.17	583	668.60	375.70	0.40%	12	0.011	0.098	1.610	0.29	1.759	5.6	28.9
578.1	578	684.24	577	670.17	453.50	3.10%	8	0.011	0.025	1.050	0.67	1.626	1.6	100.0
579.1	579	685.77	578	684.24	287.80	0.50%	8	0.011	0.022	1.060	0.25	0.673	3.3	37.8
580.1	580	692.25	579	685.77	239.20	2.70%	8	0.011	0.021	0.990	0.06	1.519	1.4	9.7
581.1	581	697.07	580	692.25	376.30	1.30%	8	0.011	0.019	0.940	0.40	1.045	1.8	60.4
582.1	582	701.58	569	695.94	404.00	1.40%	8	0.011	0.000	0.460	0.00	1.091	0.0	0.5
583.1	583	668.60	584	667.30	296.90	0.40%	12	0.011	0.110	1.720	0.31	1.801	6.1	31.4
584.1	584	667.30	679	662.00	310.40	1.70%	12	0.011	0.111	2.020	0.13	3.556	3.1	13.3
585.1	585	676.19	568	674.85	247.80	0.50%	8	0.011	0.002	0.560	0.14	0.679	0.3	21.4
586.1	586	651.40	587	649.80	285.00	0.60%	8	0.011	0.057	1.480	0.31	0.692	8.3	46.8
587.1	587	649.80	606	648.89	162.90	0.60%	10	0.011	0.073	1.560	0.16	1.251	5.8	19.0
588.1	588	654.12	586	651.40	396.40	0.70%	8	0.011	0.054	1.530	0.34	0.765	7.0	50.5
589.1	589	655.35	588	654.12	233.00	0.50%	8	0.011	0.050	1.310	0.15	0.671	7.5	22.5
590.1	590	656.64	589	655.35	239.00	0.50%	8	0.011	0.048	1.300	0.15	0.678	7.0	22.0
591.1	591	658.24	590	656.64	303.10	0.50%	8	0.011	0.045	1.280	0.14	0.671	6.7	21.3
592.1	592	659.77	591	658.24	284.90	0.50%	8	0.011	0.026	1.060	0.26	0.676	3.8	39.3
593.1	593	661.30	592	659.77	284.10	0.50%	8	0.011	0.004	0.640	0.17	0.677	0.6	26.1
594.1	594	662.78	593	661.30	257.00	0.60%	8	0.011	0.002	0.540	0.15	0.700	0.3	23.0
595.1	595	662.68	594	662.78	257.00	0.00%	8	0.011	0.000	0.000	0.21	0.182	0.1	31.7
596.1	596	673.56	597	668.10	258.60	2.10%	8	0.011	0.000	0.320	0.55	1.341	0.0	82.3
597.1	597	668.10	592	659.77	257.30	3.20%	8	0.011	0.002	0.560	0.67	1.661	0.1	100.0
598.1	598	663.04	592	659.77	285.50	1.10%	8	0.011	0.015	0.880	0.38	0.988	1.5	57.0
599.1	599	668.76	598	663.04	277.70	2.10%	8	0.011	0.007	0.670	0.59	1.325	0.5	89.1
600.1	600	673.58	599	668.76	235.80	2.00%	8	0.011	0.000	0.210	0.00	1.320	0.0	0.4

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
601.1	601	671.23	602	662.49	479.20	1.80%	8	0.011	0.003	0.570	0.49	1.246	0.3	74.1
602.1	602	662.49	603	658.97	338.00	1.00%	8	0.011	0.005	0.620	0.02	0.942	0.6	2.4
603.1	603	658.97	587	649.80	437.00	2.10%	8	0.011	0.007	0.720	0.03	1.337	0.5	5.0
604.1	604	662.00	605	658.00	391.70	1.00%	8	0.011	0.001	0.530	0.29	0.933	0.1	43.5
605.1	605	658.00	587	649.80	288.40	2.80%	8	0.011	0.004	0.620	0.67	1.556	0.3	100.0
606.1	606	648.89	2477	648.54	67.60	0.50%	10	0.011	0.073	1.550	0.16	1.204	6.0	19.0
607.1	607	658.23	588	654.12	322.90	1.30%	8	0.011	0.000	0.420	0.00	1.041	0.0	0.5
608.1	608	654.27	610	653.64	105.50	0.60%	8	0.011	0.000	0.000	0.00	0.713	0.0	0.0
609.1	609	654.23	610	653.64	146.40	0.40%	8	0.011	0.001	0.530	0.00	0.586	0.2	0.7
610.1	610	653.64	611	647.34	173.30	3.60%	8	0.011	0.004	0.580	0.01	1.760	0.2	1.6
611.1	611	647.34	612	645.22	321.30	0.70%	10	0.011	0.127	2.050	0.19	1.359	9.4	23.2
612.1	612	645.22	613	644.19	267.50	0.40%	10	0.011	0.114	1.700	0.31	1.039	11.0	36.9
613.1	613	644.19	614	642.87	243.90	0.50%	10	0.011	0.130	1.930	0.20	1.231	10.5	24.5
614.1	614	642.87	615	626.15	420.10	4.00%	10	0.011	0.143	2.240	0.13	3.338	4.3	15.3
615.1	615	626.15	616	609.06	499.40	3.40%	10	0.011	0.151	2.330	0.13	3.096	4.9	15.8
616.1	616	609.06	617	606.98	366.20	0.60%	12	0.011	0.232	2.500	0.39	2.051	11.3	38.7
617.1	617	606.98	618	606.12	152.80	0.60%	15	0.011	0.223	2.370	0.22	3.701	6.0	17.6
618.1	618	606.12	632	605.11	181.30	0.60%	15	0.011	0.233	2.370	0.23	3.683	6.3	18.1
619.1	619	607.40	618	606.12	121.30	1.10%	8	0.011	0.002	0.540	0.01	0.948	0.2	0.8
620.1	620	608.50	619	607.40	196.30	0.60%	8	0.011	0.000	0.420	0.00	0.691	0.0	0.5
621.1	621	608.25	622	605.68	493.70	0.50%	8	0.011	0.000	0.520	0.15	0.666	0.1	21.9
622.1	622	605.68	625	603.33	449.10	0.50%	8	0.011	0.004	0.640	0.15	0.668	0.6	22.8
623.1	623	608.00	629	600.64	205.00	3.60%	8	0.011	0.002	0.540	0.01	1.749	0.1	0.8
624.1	624	604.55	629	600.64	282.50	1.40%	8	0.011	0.001	0.530	0.40	1.086	0.1	59.3
625.1	625	603.33	626	602.58	129.60	0.60%	8	0.011	0.007	0.710	0.03	0.702	1.0	4.8
626.1	626	602.58	627	601.22	250.00	0.50%	8	0.011	0.007	0.730	0.17	0.681	1.0	25.6
627.1	627	601.22	628	599.04	269.80	0.80%	8	0.011	0.009	0.040	0.67	0.830	1.0	100.0
628.1	628	599.04	640	597.56	348.10	0.40%	18	0.011	0.268	0.230	1.50	5.232	5.1	100.0
629.1	629	600.64	628	599.04	299.70	0.50%	18	0.011	0.259	0.230	1.50	5.862	4.4	100.0
630.1	630	602.24	629	600.64	299.00	0.50%	18	0.011	0.251	2.430	0.22	5.869	4.3	14.6
631.1	631	611.50	630	602.24	379.50	2.40%	8	0.011	0.000	0.420	0.66	1.442	0.0	99.7
632.1	632	605.11	633	603.99	204.20	0.50%	15	0.011	0.235	2.360	0.23	3.654	6.4	18.3
633.1	633	603.99	630	602.24	299.60	0.60%	15	0.011	0.244	2.510	0.23	3.771	6.5	18.0
634.1	634	613.00	636	611.55	268.40	0.50%	8	0.011	0.050	1.360	0.29	0.678	7.3	43.6
635.1	635	614.35	634	613.00	250.30	0.50%	8	0.011	0.048	1.340	0.28	0.678	7.1	41.8
636.1	636	611.55	638	609.84	322.60	0.50%	8	0.011	0.054	1.410	0.15	0.672	8.1	22.7
637.1	637	613.00	636	611.55	123.50	1.20%	8	0.011	0.002	0.540	0.00	1.000	0.2	0.7
638.1	638	609.84	640	597.56	168.70	7.30%	8	0.011	0.058	1.360	0.08	2.490	2.3	12.3
639.1	639	610.52	638	609.84	115.60	0.60%	8	0.011	0.001	0.540	0.00	0.708	0.2	0.7
640.1	640	597.56	641	596.65	200.50	0.50%	18	0.011	0.328	0.290	1.50	5.405	6.1	100.0

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
641.1	641	596.65	2091	593.90	286.60	1.00%	18	0.011	0.328	0.290	1.50	7.859	4.2	100.0
642.1	642	615.06	635	614.35	336.60	0.20%	8	0.011	0.000	0.210	0.00	0.424	0.0	0.4
643.1	643	615.44	644	611.33	268.10	1.50%	8	0.011	0.000	0.320	0.41	1.143	0.0	62.1
644.1	644	611.33	633	603.99	321.60	2.30%	8	0.011	0.002	0.590	0.01	1.394	0.2	2.1
645.1	645	611.49	618	606.12	339.70	1.60%	8	0.011	0.006	0.650	0.02	1.160	0.5	3.1
646.1	646	617.88	645	611.49	251.50	2.50%	8	0.011	0.004	0.630	0.66	1.471	0.3	98.7
647.1	647	620.79	646	617.88	280.60	1.00%	8	0.011	0.002	0.540	0.30	0.940	0.2	44.4
648.1	648	627.36	649	624.45	224.10	1.30%	8	0.011	0.023	1.020	0.07	1.052	2.2	10.3
649.1	649	624.45	653	621.44	165.20	1.80%	8	0.011	0.025	1.100	0.08	1.246	2.0	12.2
650.1	650	634.98	648	627.36	294.00	2.60%	8	0.011	0.002	0.540	0.67	1.486	0.1	100.0
651.1	651	635.99	650	634.98	203.60	0.50%	8	0.011	0.000	0.320	0.00	0.650	0.0	0.4
652.1	652	616.49	616	609.06	286.90	2.60%	8	0.011	0.029	1.150	0.67	1.485	2.0	100.0
653.1	653	621.44	652	616.49	179.50	2.80%	8	0.011	0.028	1.110	0.08	1.533	1.8	11.8
654.1	654	624.96	653	621.44	138.30	2.50%	8	0.011	0.001	0.530	0.00	1.472	0.1	0.7
655.1	655	615.96	656	613.60	226.10	1.00%	15	0.011	0.000	0.000	0.00	5.041	0.0	0.0
656.1	656	613.60	657	610.74	265.70	1.10%	15	0.011	0.000	0.000	0.29	5.119	0.0	22.9
657.1	657	610.74	658	608.25	238.00	1.00%	15	0.011	0.000	0.000	0.00	5.046	0.0	0.0
658.1	658	608.25	659	607.66	98.40	0.60%	15	0.011	0.000	0.000	0.00	3.820	0.0	0.0
659.1	659	607.66	617	606.98	165.10	0.40%	15	0.011	0.000	0.000	0.00	3.166	0.0	0.0
660.1	660	617.81	661	617.24	109.50	0.50%	8	0.011	0.010	0.830	0.05	0.666	1.5	7.6
661.1	661	617.24	635	614.35	296.70	1.00%	8	0.011	0.041	1.420	0.41	0.911	4.5	61.4
662.1	662	618.22	661	617.24	167.90	0.60%	8	0.011	0.001	0.520	0.00	0.705	0.1	0.5
663.1	663	619.13	662	618.22	162.80	0.60%	8	0.011	0.000	0.210	0.00	0.690	0.0	0.4
664.1	664	622.20	665	615.16	274.50	2.60%	10	0.012	0.030	1.130	0.78	2.457	1.2	93.9
665.1	665	615.16	666	609.06	299.50	2.00%	10	0.011	0.037	1.230	0.09	2.388	1.5	10.7
666.1	666	609.06	667	607.30	159.90	1.10%	10	0.011	0.039	1.340	0.11	1.755	2.2	12.8
667.1	667	607.30	2085	597.00	172.20	6.00%	10	0.011	0.084	1.620	0.09	4.093	2.1	11.3
668.1	668	619.09	665	615.16	382.90	1.00%	8	0.011	0.002	0.550	0.29	0.935	0.3	43.2
669.1	669	608.80	667	607.30	281.50	0.50%	10	0.012	0.042	1.110	0.29	1.120	3.7	34.3
670.1	670	611.31	669	608.80	483.20	0.50%	10	0.012	0.038	1.050	0.27	1.106	3.4	32.6
671.1	671	621.91	670	611.31	297.20	3.60%	10	0.011	0.036	1.180	0.83	3.161	1.1	100.0
672.1	672	622.04	668	619.09	286.20	1.00%	8	0.011	0.000	0.420	0.30	0.937	0.0	44.7
673.1	673	623.28	671	621.91	255.30	0.50%	10	0.011	0.034	1.080	0.26	1.226	2.8	30.9
674.1	674	632.99	673	623.28	293.50	3.30%	10	0.011	0.032	1.140	0.83	3.044	1.0	100.0
675.1	675	633.86	674	632.99	162.20	0.50%	10	0.011	0.030	0.970	0.12	1.226	2.4	14.2
676.1	676	639.02	674	632.99	239.30	2.50%	8	0.011	0.000	0.110	0.00	1.465	0.0	0.3
677.1	677	635.70	678	634.57	233.90	0.50%	8	0.012	0.009	0.790	0.04	0.588	1.5	6.6
678.1	678	634.57	664	622.20	342.00	3.60%	8	0.011	0.009	0.720	0.03	1.755	0.5	4.5
679.1	679	662.00	681	653.53	195.80	4.30%	12	0.011	0.111	1.900	0.11	5.661	2.0	10.9
680.1	680	657.56	681	653.53	56.30	7.20%	6	0.011	0.000	0.000	0.00	1.147	0.0	0.0

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
681.1	681	653.53	2392	653.33	93.70	0.20%	15	0.011	0.111	1.320	0.20	2.279	4.9	16.3
682.1	682	652.54	687	651.89	257.20	0.30%	15	0.011	0.136	1.500	0.28	2.480	5.5	22.3
683.1	683	654.81	682	652.54	280.90	0.80%	8	0.011	0.019	1.020	0.30	0.830	2.2	45.4
684.1	684	656.07	683	654.81	221.50	0.60%	8	0.011	0.017	1.010	0.07	0.696	2.5	11.2
685.1	685	656.46	684	656.07	93.90	0.40%	8	0.011	0.000	0.000	0.00	0.595	0.0	0.0
686.1	686	670.50	687	651.89	350.30	5.30%	8	0.011	0.001	0.530	0.67	2.127	0.1	100.0
687.1	687	651.89	688	651.18	281.50	0.30%	15	0.011	0.139	1.510	0.29	2.478	5.6	23.0
688.1	688	651.18	699	650.24	382.40	0.20%	15	0.011	0.143	1.520	0.29	2.446	5.8	23.0
689.1	689	667.63	688	651.18	322.10	5.10%	8	0.011	0.001	0.530	0.00	2.086	0.1	0.7
690.1	690	671.61	689	667.63	302.30	1.30%	8	0.011	0.000	0.000	0.00	1.059	0.0	0.0
691.1	691	668.35	692	660.28	403.10	2.00%	8	0.011	0.000	0.300	0.00	1.306	0.0	0.4
692.1	692	660.28	694	647.40	309.00	4.20%	8	0.011	0.004	0.590	0.01	1.884	0.2	1.9
693.1	693	664.17	692	660.28	193.80	2.00%	8	0.011	0.001	0.530	0.00	1.308	0.1	0.7
694.1	694	647.40	1430	635.30	166.80	7.30%	15	0.011	0.155	2.200	0.10	13.287	1.2	8.1
695.1	695	648.37	694	647.40	401.40	0.20%	15	0.011	0.151	1.540	0.23	2.425	6.2	18.1
697.1	697	648.93	695	648.37	226.50	0.20%	15	0.011	0.150	1.550	0.22	2.453	6.1	17.9
698.1	698	649.80	697	648.93	336.70	0.30%	15	0.011	0.149	1.570	0.22	2.508	5.9	17.7
699.1	699	650.24	698	649.80	158.80	0.30%	15	0.011	0.146	1.590	0.22	2.597	5.6	17.2
700.1	700	666.01	698	649.80	279.00	5.80%	8	0.011	0.001	0.530	0.67	2.225	0.0	100.0
701.1	701	681.32	706	666.65	291.60	5.00%	8	0.011	0.000	0.000	0.67	2.070	0.0	100.0
702.1	702	670.12	706	666.65	142.90	2.40%	8	0.011	0.003	0.560	0.01	1.438	0.2	1.2
703.1	703	670.74	702	670.12	31.80	1.90%	8	0.011	0.003	0.590	0.01	1.288	0.2	2.0
704.1	704	674.47	703	670.74	195.10	1.90%	8	0.011	0.003	0.590	0.01	1.276	0.2	2.1
705.1	705	677.35	704	674.47	274.50	1.00%	8	0.011	0.001	0.520	0.29	0.945	0.0	43.7
706.1	706	666.65	707	661.90	143.70	3.30%	8	0.011	0.004	0.590	0.01	1.678	0.2	1.8
707.1	707	661.90	708	655.95	166.50	3.60%	8	0.011	0.010	0.710	0.03	1.745	0.6	4.1
708.1	708	655.95	709	654.89	164.30	0.60%	8	0.011	0.010	0.790	0.04	0.741	1.3	6.5
709.1	709	654.89	710	651.84	499.00	0.60%	8	0.011	0.010	0.820	0.07	0.722	1.4	10.2
710.1	710	651.84	2193	641.20	352.80	3.00%	18	0.011	1.382	5.970	1.14	13.933	9.9	76.3
711.1	711	669.76	707	661.90	110.80	7.10%	8	0.011	0.005	0.610	0.01	2.458	0.2	2.2
712.1	712	679.63	711	669.76	221.80	4.40%	8	0.011	0.001	0.520	0.00	1.947	0.0	0.5
713.1	713	684.14	712	679.63	98.70	4.60%	8	0.011	0.000	0.000	0.00	1.973	0.0	0.0
714.1	714	671.22	711	669.76	172.60	0.80%	8	0.011	0.003	0.570	0.01	0.849	0.3	1.5
715.1	715	676.49	714	671.22	205.90	2.60%	8	0.011	0.002	0.540	0.01	1.477	0.1	0.8
716.1	716	686.74	2428	683.66	103.70	3.00%	8	0.011	0.001	0.530	0.00	1.591	0.1	0.6
717.1	717	677.05	715	676.49	78.10	0.70%	8	0.011	0.000	0.000	0.00	0.782	0.0	0.0
718.1	718	675.22	723	675.25	249.10	0.00%	8	0.011	0.000	0.000	0.19	0.101	0.0	28.4
719.1	719	677.57	720	670.58	504.40	1.40%	8	0.011	0.000	0.460	0.00	1.087	0.0	0.5
720.1	720	670.58	721	664.53	281.50	2.10%	8	0.011	0.003	0.600	0.62	1.353	0.2	93.2
721.1	721	664.53	724	662.82	142.90	1.20%	8	0.011	0.016	0.870	0.05	1.010	1.6	7.5

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
722.1	722	664.87	721	664.53	17.20	2.00%	8	0.011	0.002	0.540	0.00	1.297	0.1	0.7
723.1	723	675.25	722	664.87	267.20	3.90%	8	0.011	0.002	0.540	0.67	1.819	0.1	100.0
724.1	724	662.82	725	662.82	38.40	0.00%	8	0.011	0.016	0.400	0.16	0.000	Infinity	23.3
725.1	725	662.82	684	656.07	142.10	4.80%	8	0.011	0.016	0.830	0.04	2.012	0.8	6.3
726.1	726	667.84	721	664.53	294.50	1.10%	8	0.011	0.008	0.700	0.36	0.978	0.9	53.8
727.1	727	676.28	726	667.84	277.60	3.00%	8	0.011	0.001	0.530	0.67	1.609	0.1	100.0
728.1	728	672.68	726	667.84	288.90	1.70%	8	0.011	0.005	0.620	0.50	1.195	0.4	75.1
729.1	729	674.86	728	672.68	65.00	3.40%	8	0.011	0.003	0.560	0.01	1.690	0.2	1.3
730.1	730	679.37	729	674.86	465.90	1.00%	8	0.011	0.003	0.550	0.26	0.908	0.3	38.4
731.1	731	681.89	730	679.37	259.60	1.00%	8	0.011	0.001	0.530	0.26	0.909	0.2	38.5
732.1	732	684.52	733	683.34	70.90	1.70%	8	0.011	0.000	0.460	0.00	1.191	0.0	0.5
733.1	733	683.34	731	681.89	164.70	0.90%	8	0.011	0.001	0.530	0.00	0.866	0.1	0.6
734.1	734	682.21	735	676.92	278.90	1.90%	8	0.011	0.000	0.000	0.53	1.271	0.0	79.3
735.1	735	676.92	736	661.72	297.50	5.10%	8	0.011	0.001	0.530	0.67	2.086	0.1	100.0
736.1	736	661.72	737	660.18	113.70	1.40%	8	0.011	0.003	0.550	0.01	1.074	0.2	1.0
737.1	737	660.18	739	639.16	309.10	6.80%	8	0.011	0.004	0.620	0.02	2.407	0.2	2.5
738.1	738	660.63	737	660.18	77.90	0.60%	8	0.011	0.001	0.530	0.00	0.702	0.2	0.7
739.1	739	639.16	1990	637.51	452.70	0.40%	18	0.011	1.395	3.620	0.65	4.844	28.8	43.2
740.1	740	663.05	741	661.92	196.30	0.60%	8	0.011	0.000	0.000	0.00	0.700	0.0	0.0
741.1	741	661.92	742	660.61	168.20	0.80%	8	0.011	0.001	0.530	0.00	0.815	0.1	0.7
742.1	742	660.61	745	659.50	191.80	0.60%	8	0.011	0.005	0.670	0.02	0.702	0.8	3.7
743.1	743	663.21	742	660.61	150.40	1.70%	8	0.011	0.003	0.640	0.02	1.213	0.3	3.5
744.1	744	664.58	743	663.21	227.40	0.60%	8	0.011	0.003	0.580	0.01	0.716	0.4	1.8
745.1	745	659.50	747	658.45	173.20	0.60%	8	0.011	0.006	0.690	0.03	0.719	0.8	4.2
746.1	746	665.17	744	664.58	176.00	0.30%	8	0.011	0.001	0.530	0.00	0.534	0.3	0.7
747.1	747	658.45	752	657.12	294.30	0.50%	8	0.011	0.007	0.760	0.17	0.621	1.1	26.1
748.1	748	667.11	746	665.17	225.40	0.90%	8	0.011	0.000	0.300	0.00	0.856	0.0	0.4
749.1	749	668.81	751	668.19	91.60	0.70%	8	0.011	0.000	0.300	0.00	0.759	0.0	0.4
750.1	750	672.30	751	668.19	82.20	5.00%	8	0.011	0.000	0.000	0.00	2.064	0.0	0.0
751.1	751	668.19	752	657.12	281.20	3.90%	8	0.011	0.001	0.530	0.67	1.831	0.1	100.0
752.1	752	657.12	753	654.86	363.60	0.60%	8	0.011	0.010	0.790	0.20	0.728	1.3	30.7
753.1	753	654.86	754	635.46	160.70	12.10%	8	0.011	0.012	0.720	0.02	3.207	0.4	3.7
754.1	754	635.46	1430	635.30	134.70	0.10%	18	0.011	1.413	2.920	0.66	2.766	51.1	44.0
755.1	755	702.00	764	700.75	293.20	0.40%	8	0.011	0.006	0.710	0.16	0.603	0.9	23.8
756.1	756	711.10	755	702.00	350.30	2.60%	8	0.011	0.004	0.580	0.66	1.488	0.2	99.0
757.1	757	715.39	756	711.10	359.10	1.20%	8	0.011	0.002	0.540	0.31	1.009	0.2	46.7
758.1	758	716.81	757	715.39	254.60	0.60%	8	0.011	0.001	0.520	0.15	0.689	0.1	21.8
759.1	759	718.80	760	716.79	377.50	0.50%	8	0.011	0.000	0.000	0.14	0.674	0.0	21.5
760.1	760	716.79	767	713.64	380.40	0.80%	8	0.011	0.001	0.530	0.23	0.840	0.1	34.4
761.1	761	717.08	762	714.04	301.00	1.00%	8	0.011	0.001	0.520	0.00	0.928	0.1	0.5

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
762.1	762	714.04	763	707.04	362.40	1.90%	8	0.011	0.002	0.560	0.51	1.283	0.2	76.4
763.1	763	707.04	764	700.75	327.90	1.90%	8	0.011	0.004	0.580	0.01	1.278	0.3	1.4
764.1	764	700.75	581	697.07	289.60	1.30%	8	0.011	0.012	0.780	0.41	1.041	1.1	60.8
765.1	765	701.77	581	697.07	385.70	1.20%	8	0.011	0.005	0.610	0.35	1.019	0.5	52.5
766.1	766	707.61	765	701.77	386.50	1.50%	8	0.011	0.004	0.630	0.44	1.135	0.3	65.5
767.1	767	713.64	766	707.61	387.10	1.60%	8	0.011	0.003	0.610	0.45	1.152	0.2	67.3
768.1	768	700.63	578	684.24	457.60	3.60%	8	0.011	0.001	0.520	0.67	1.747	0.0	100.0
769.1	769	670.11	770	666.48	159.80	2.30%	8	0.012	0.002	0.560	0.01	1.275	0.2	1.4
770.1	770	666.48	771	662.54	468.30	0.80%	8	0.012	0.004	0.610	0.24	0.776	0.5	35.3
771.1	771	662.54	772	657.74	479.60	1.00%	8	0.012	0.008	0.710	0.30	0.846	0.9	44.6
772.1	772	657.74	773	650.65	415.70	1.70%	8	0.012	0.012	0.760	0.03	1.105	1.0	5.0
773.1	773	650.65	382	649.00	329.60	0.50%	8	0.012	0.041	1.100	0.15	0.599	6.8	22.0
774.1	774	652.00	773	650.65	289.20	0.50%	8	0.012	0.025	0.850	0.26	0.578	4.3	38.9
775.1	775	656.99	774	652.00	414.30	1.20%	8	0.012	0.008	0.690	0.03	0.929	0.8	4.0
776.1	776	661.79	775	656.99	479.70	1.00%	8	0.012	0.004	0.610	0.28	0.846	0.5	42.3
777.1	777	667.76	776	661.79	401.70	1.50%	8	0.012	0.001	0.530	0.00	1.031	0.1	0.7
778.1	778	666.43	779	659.49	456.40	1.50%	8	0.012	0.002	0.540	0.39	1.043	0.2	58.6
779.1	779	659.49	780	656.45	418.60	0.70%	8	0.012	0.005	0.650	0.02	0.721	0.7	3.5
780.1	780	656.45	781	653.55	400.10	0.70%	8	0.012	0.009	0.760	0.04	0.720	1.2	5.8
781.1	781	653.55	774	652.00	291.00	0.50%	8	0.012	0.013	0.950	0.22	0.618	2.1	33.7
782.1	782	685.50	783	684.50	93.40	1.10%	8	0.011	0.000	0.000	0.00	0.955	0.0	0.0
783.1	783	684.50	784	682.72	120.70	1.50%	8	0.011	0.001	0.530	0.00	1.121	0.1	0.7
784.1	784	682.72	786	680.74	102.70	1.90%	8	0.011	0.001	0.530	0.00	1.282	0.1	0.7
785.1	785	686.12	798	681.59	297.20	1.50%	8	0.011	0.001	0.530	0.46	1.139	0.1	68.6
786.1	786	680.74	787	678.24	123.50	2.00%	8	0.011	0.002	0.540	0.01	1.313	0.1	0.8
787.1	787	678.24	788	675.64	264.90	1.00%	8	0.011	0.002	0.540	0.27	0.914	0.2	39.8
788.1	788	675.64	789	675.08	115.10	0.50%	8	0.011	0.004	0.650	0.02	0.644	0.7	3.5
789.1	789	675.08	790	673.67	123.20	1.10%	8	0.011	0.006	0.630	0.02	0.987	0.6	2.6
790.1	790	673.67	791	671.84	122.70	1.50%	8	0.011	0.006	0.670	0.03	1.127	0.5	3.8
791.1	791	671.84	808	669.86	397.10	0.50%	8	0.011	0.034	1.060	0.27	0.652	5.2	41.1
792.1	792	672.30	791	671.84	99.70	0.50%	8	0.011	0.027	0.960	0.12	0.627	4.2	18.0
793.1	793	672.79	792	672.30	110.50	0.40%	8	0.011	0.026	0.950	0.12	0.615	4.3	18.0
794.1	794	676.00	793	672.79	76.50	4.20%	8	0.011	0.006	0.640	0.02	1.891	0.3	2.9
795.1	795	677.88	794	676.00	115.80	1.60%	8	0.011	0.006	0.690	0.03	1.176	0.5	4.3
796.1	796	679.43	795	677.88	103.40	1.50%	8	0.011	0.005	0.660	0.02	1.130	0.5	3.5
797.1	797	680.44	796	679.43	102.00	1.00%	8	0.011	0.005	0.620	0.02	0.918	0.5	2.4
798.1	798	681.59	797	680.44	114.70	1.00%	8	0.011	0.005	0.620	0.02	0.924	0.5	2.5
799.1	799	678.23	800	677.58	130.00	0.50%	8	0.011	0.005	0.650	0.02	0.653	0.7	3.5
800.1	800	677.58	801	677.08	99.80	0.50%	8	0.011	0.005	0.660	0.02	0.653	0.7	3.6
801.1	801	677.08	802	674.91	338.30	0.60%	8	0.011	0.007	0.710	0.03	0.739	0.9	4.9

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
802.1	802	674.91	803	673.20	81.20	2.10%	8	0.011	0.009	0.760	0.04	1.340	0.7	5.8
803.1	803	673.20	793	672.79	128.10	0.30%	8	0.011	0.020	0.880	0.10	0.522	3.8	15.5
804.1	804	677.19	805	676.49	151.40	0.50%	8	0.011	0.000	0.380	0.00	0.628	0.0	0.4
805.1	805	676.49	803	673.20	279.70	1.20%	8	0.011	0.008	0.690	0.35	1.001	0.8	53.2
806.1	806	679.99	805	676.49	456.60	0.80%	8	0.011	0.004	0.610	0.21	0.808	0.5	31.7
807.1	807	683.94	806	679.99	384.30	1.00%	8	0.011	0.001	0.530	0.29	0.936	0.1	43.0
808.1	808	669.86	809	665.97	369.20	1.10%	8	0.011	0.037	1.350	0.39	0.947	3.9	58.5
809.1	809	665.97	810	664.38	91.50	1.70%	8	0.011	0.040	1.320	0.10	1.217	3.3	15.3
810.1	810	664.38	811	663.27	110.70	1.00%	8	0.011	0.041	1.400	0.12	0.924	4.4	17.6
811.1	811	663.27	812	660.55	274.80	1.00%	8	0.011	0.041	1.420	0.39	0.918	4.5	58.8
812.1	812	660.55	814	659.95	121.10	0.50%	8	0.011	0.045	1.230	0.15	0.650	6.9	21.8
813.1	813	663.79	812	660.55	162.40	2.00%	8	0.011	0.002	0.540	0.00	1.304	0.1	0.7
814.1	814	659.95	815	659.09	169.50	0.50%	8	0.011	0.045	1.240	0.15	0.658	6.9	21.8
815.1	815	659.09	817	657.69	282.40	0.50%	8	0.011	0.048	1.280	0.29	0.650	7.4	43.2
816.1	816	664.15	815	659.09	253.30	2.00%	8	0.011	0.000	0.380	0.51	1.304	0.0	76.4
817.1	817	657.69	818	657.00	91.50	0.80%	8	0.011	0.051	1.540	0.14	0.801	6.4	20.5
818.1	818	657.00	838	648.61	307.60	2.70%	8	0.011	0.051	1.400	0.10	1.524	3.4	15.2
819.1	819	661.87	817	657.69	209.30	2.00%	8	0.011	0.002	0.540	0.00	1.304	0.1	0.7
820.1	820	675.41	821	671.56	125.40	3.10%	8	0.011	0.000	0.000	0.00	1.617	0.0	0.0
821.1	821	671.56	849	671.02	109.70	0.50%	8	0.011	0.001	0.530	0.00	0.648	0.2	0.7
822.1	822	668.36	823	665.51	123.20	2.30%	8	0.011	0.000	0.000	0.00	1.404	0.0	0.0
823.1	823	665.51	824	662.97	121.50	2.10%	8	0.011	0.001	0.530	0.00	1.335	0.1	0.7
824.1	824	662.97	827	661.80	142.50	0.80%	8	0.011	0.004	0.600	0.01	0.836	0.4	2.1
825.1	825	663.72	824	662.97	197.40	0.40%	8	0.011	0.000	0.000	0.00	0.569	0.0	0.0
826.1	826	664.09	825	663.72	80.60	0.50%	8	0.011	0.000	0.000	0.00	0.625	0.0	0.0
827.1	827	661.80	828	661.14	171.50	0.40%	8	0.011	0.005	0.650	0.02	0.573	0.8	3.4
828.1	828	661.14	829	660.12	279.40	0.40%	8	0.011	0.006	0.760	0.14	0.558	1.1	21.7
829.1	829	660.12	830	658.99	309.60	0.40%	8	0.011	0.009	0.840	0.05	0.558	1.6	8.1
830.1	830	658.99	831	658.14	226.10	0.40%	8	0.011	0.011	0.850	0.05	0.566	2.0	7.9
831.1	831	658.14	832	657.46	176.30	0.40%	8	0.011	0.013	0.940	0.07	0.573	2.3	10.1
832.1	832	657.46	833	656.81	166.30	0.40%	8	0.011	0.015	0.980	0.07	0.577	2.6	10.9
833.1	833	656.81	834	656.04	204.20	0.40%	8	0.011	0.017	1.050	0.08	0.567	3.0	12.4
834.1	834	656.04	835	655.26	204.70	0.40%	8	0.011	0.019	1.050	0.09	0.570	3.2	13.1
835.1	835	655.26	836	654.79	113.30	0.40%	8	0.011	0.037	1.050	0.14	0.594	6.2	21.4
836.1	836	654.79	837	654.26	132.10	0.40%	8	0.011	0.038	1.050	0.14	0.585	6.4	21.6
837.1	837	654.26	838	648.61	399.20	1.40%	8	0.011	0.039	1.330	0.11	1.098	3.5	15.9
838.1	838	648.61	839	647.00	67.10	2.40%	8	0.011	0.094	1.860	0.13	1.430	6.6	19.1
839.1	839	647.00	840	636.26	33.90	31.60%	8	0.011	0.094	1.600	0.07	5.192	1.8	11.2
840.1	840	636.26	2275	633.79	735.40	0.30%	24	0.011	3.331	4.380	0.80	10.014	33.3	40.1
841.1	841	660.67	835	655.26	154.30	3.50%	8	0.011	0.016	0.900	0.05	1.728	0.9	8.2

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
842.1	842	661.76	841	660.67	244.90	0.40%	8	0.011	0.014	0.950	0.07	0.616	2.3	10.1
843.1	843	662.37	842	661.76	131.40	0.50%	8	0.011	0.013	0.930	0.07	0.629	2.1	9.8
844.1	844	666.07	843	662.37	400.40	0.90%	8	0.011	0.010	0.750	0.04	0.887	1.1	5.4
845.1	845	666.64	844	666.07	115.40	0.50%	8	0.011	0.009	0.810	0.05	0.649	1.4	7.3
846.1	846	667.16	845	666.64	106.10	0.50%	8	0.011	0.009	0.800	0.05	0.646	1.4	7.0
847.1	847	668.81	846	667.16	387.10	0.40%	8	0.011	0.006	0.700	0.15	0.603	0.9	22.3
848.1	848	669.67	847	668.81	188.10	0.50%	8	0.011	0.004	0.630	0.02	0.624	0.6	3.0
849.1	849	671.02	848	669.67	313.20	0.40%	8	0.011	0.002	0.540	0.00	0.606	0.3	0.7
850.1	850	657.16	851	655.60	106.80	1.50%	8	0.011	0.000	0.000	0.00	1.116	0.0	0.0
851.1	851	655.60	852	649.96	430.20	1.30%	8	0.011	0.006	0.630	0.02	1.057	0.6	2.6
852.1	852	649.96	853	646.25	312.70	1.20%	8	0.011	0.020	1.000	0.07	1.005	2.0	10.3
853.1	853	646.25	854	631.31	229.40	6.50%	8	0.011	0.023	0.970	0.06	2.356	1.0	8.6
854.1	854	631.31	1984	631.31	266.20	0.00%	24	0.011	3.488	2.980	1.12	0.000	Infinity	56.1
855.1	855	659.81	859	658.62	143.00	0.80%	8	0.011	0.000	0.510	0.00	0.842	0.0	0.5
856.1	856	659.80	857	656.37	359.30	1.00%	8	0.011	0.003	0.560	0.25	0.902	0.3	38.0
857.1	857	656.37	858	653.48	444.60	0.70%	8	0.011	0.006	0.670	0.03	0.744	0.8	3.8
858.1	858	653.48	852	649.96	252.50	1.40%	8	0.011	0.009	0.700	0.38	1.090	0.9	56.6
859.1	859	658.62	851	655.60	359.80	0.80%	8	0.011	0.002	0.540	0.22	0.846	0.2	33.1
860.1	860	665.00	433	661.23	221.90	1.70%	6	0.012	0.000	0.000	0.00	0.512	0.0	0.0
861.1	861	652.16	425	651.91	58.30	0.40%	8	0.012	0.136	1.830	0.24	0.554	24.5	36.3
862.1	862	661.88	875	647.93	155.20	9.00%	8	0.011	0.100	1.740	0.09	2.767	3.6	14.1
863.1	863	709.69	92	702.44	394.30	1.80%	8	0.011	0.127	2.230	0.67	1.252	10.2	100.0
864.1	864	709.95	865	704.17	292.50	2.00%	8	0.011	0.006	0.620	0.59	1.298	0.4	89.1
865.1	865	704.17	868	696.51	310.70	2.50%	8	0.011	0.010	0.730	0.03	1.449	0.7	4.4
866.1	866	707.14	867	705.78	327.40	0.40%	8	0.011	0.004	0.650	0.03	0.595	0.6	3.8
867.1	867	705.78	868	696.51	199.30	4.70%	8	0.011	0.007	0.660	0.02	1.990	0.4	3.3
868.1	868	696.51	872	678.90	301.10	5.80%	8	0.011	0.018	0.890	0.05	2.232	0.8	7.6
869.1	869	676.61	LS_KT	668.00	14.00	61.30%	8	0.011	0.060	1.270	0.06	7.229	0.8	9.3
870.1	870	677.22	869	676.61	108.90	0.60%	8	0.011	0.060	1.480	0.16	0.691	8.6	23.4
871.1	871	678.15	870	677.22	206.50	0.50%	8	0.011	0.051	1.280	0.15	0.619	8.2	23.2
872.1	872	678.90	871	678.15	164.30	0.50%	8	0.011	0.048	1.260	0.15	0.624	7.7	22.6
873.1	873	680.20	872	678.90	299.40	0.40%	8	0.011	0.026	0.890	0.13	0.608	4.3	18.8
874.1	874	681.90	873	680.20	298.30	0.60%	8	0.011	0.014	0.960	0.07	0.697	2.1	10.4
875.1	875	647.93	876	647.21	503.50	0.10%	27	0.011	0.871	2.180	0.48	8.945	9.7	21.3
876.1	876	647.21	95	646.34	511.00	0.20%	27	0.011	0.878	2.310	0.46	9.760	9.0	20.5
877.1	877	696.10	878	679.51	310.10	5.30%	8	0.011	0.000	0.000	0.00	2.135	0.0	0.0
878.1	878	679.51	879	666.00	313.50	4.30%	8	0.011	0.004	0.600	0.01	1.916	0.2	2.1
879.1	879	666.00	881	664.90	305.20	0.40%	8	0.011	0.009	0.850	0.06	0.554	1.6	8.3
880.1	880	688.60	881	664.90	440.70	5.40%	8	0.011	0.003	0.570	0.01	2.141	0.1	1.5
881.1	881	664.90	886	664.49	99.50	0.40%	8	0.011	0.018	1.000	0.09	0.593	3.0	13.3

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
882.1	882	666.00	886	664.49	129.20	1.20%	8	0.011	0.000	0.000	0.00	0.998	0.0	0.0
883.1	883	702.50	884	688.25	410.40	3.50%	8	0.011	0.000	0.000	0.00	1.720	0.0	0.0
884.1	884	688.25	885	666.90	411.50	5.20%	8	0.011	0.000	0.000	0.00	2.102	0.0	0.0
885.1	885	666.90	862	661.88	122.10	4.10%	8	0.011	0.004	0.590	0.01	1.871	0.2	1.8
886.1	886	664.49	1257	649.42	148.40	10.20%	8	0.011	0.018	0.850	0.04	2.941	0.6	6.4
887.1	887	705.39	888	704.90	78.40	0.60%	8	0.011	0.000	0.000	0.00	0.730	0.0	0.0
888.1	888	704.90	889	690.90	398.90	3.50%	8	0.011	0.002	0.540	0.01	1.729	0.1	0.8
889.1	889	690.90	890	683.00	216.20	3.70%	8	0.011	0.006	0.620	0.02	1.764	0.3	2.4
890.1	890	683.00	902	678.62	68.70	6.40%	8	0.011	0.008	0.680	0.02	2.330	0.3	3.5
891.1	891	705.45	892	703.45	131.00	1.50%	8	0.011	0.000	0.000	0.00	1.140	0.0	0.0
892.1	892	703.45	893	696.82	449.20	1.50%	8	0.011	0.002	0.540	0.37	1.121	0.2	56.0
893.1	893	696.82	894	690.90	91.70	6.50%	8	0.011	0.006	0.640	0.02	2.345	0.3	2.8
894.1	894	690.90	895	690.90	79.60	0.00%	8	0.011	0.007	0.180	0.16	0.000	Infinity	23.7
895.1	895	690.90	896	675.32	298.90	5.20%	8	0.011	0.007	0.680	0.02	2.107	0.4	3.5
896.1	896	675.32	897	659.25	309.70	5.20%	8	0.011	0.010	0.740	0.03	2.103	0.5	4.8
897.1	897	659.25	898	652.15	103.20	6.90%	8	0.011	0.014	0.790	0.04	2.421	0.6	5.5
898.1	898	652.15	80	651.67	188.00	0.30%	27	0.011	0.597	2.350	0.35	11.954	5.0	15.5
899.1	899	652.26	898	652.15	280.90	0.00%	27	0.011	0.539	1.410	0.48	4.681	11.5	21.1
900.1	900	654.09	899	652.26	98.10	1.90%	8	0.011	0.014	0.880	0.05	1.260	1.1	8.0
901.1	901	672.58	900	654.09	400.30	4.60%	8	0.011	0.010	0.710	0.03	1.984	0.5	4.1
902.1	902	678.62	901	672.58	182.30	3.30%	8	0.011	0.008	0.670	0.02	1.680	0.5	3.2
903.1	903	770.31	904	768.75	291.00	0.50%	8	0.011	0.023	1.120	0.25	0.676	3.4	38.0
904.1	904	768.75	905	767.62	206.50	0.50%	8	0.011	0.029	0.980	0.13	0.683	4.2	18.8
905.1	905	767.62	906	766.63	178.90	0.60%	8	0.011	0.030	1.020	0.13	0.687	4.4	18.9
906.1	906	766.63	907	766.40	76.60	0.30%	8	0.011	0.036	0.920	0.15	0.506	7.2	23.0
907.1	907	766.40	908	765.22	165.70	0.70%	8	0.011	0.037	1.270	0.12	0.779	4.7	18.6
908.1	908	765.22	909	763.94	237.30	0.50%	8	0.011	0.057	1.410	0.16	0.678	8.4	23.4
909.1	909	763.94	910	762.50	258.70	0.60%	8	0.011	0.067	1.760	0.29	0.689	9.7	43.8
910.1	910	762.50	1117	762.45	277.70	0.00%	8	0.011	0.076	0.690	0.33	0.124	61.2	49.9
911.1	911	770.93	912	769.77	210.30	0.60%	8	0.011	0.002	0.620	0.02	0.686	0.3	3.0
912.1	912	769.77	913	768.46	244.10	0.50%	8	0.011	0.004	0.640	0.02	0.676	0.5	3.3
913.1	913	768.46	910	762.50	131.30	4.50%	8	0.011	0.006	0.630	0.02	1.966	0.3	2.7
914.1	914	766.09	909	763.94	216.10	1.00%	8	0.011	0.007	0.670	0.02	0.921	0.7	3.5
915.1	915	768.26	914	766.09	416.20	0.50%	8	0.011	0.002	0.540	0.01	0.666	0.2	0.8
916.1	916	769.16	915	768.26	162.80	0.60%	8	0.011	0.000	0.500	0.00	0.686	0.1	0.5
917.1	917	771.28	908	765.22	154.50	3.90%	8	0.011	0.001	0.530	0.00	1.828	0.1	0.7
918.1	918	774.57	920	772.34	207.90	1.10%	8	0.011	0.001	0.530	0.00	0.956	0.1	0.7
919.1	919	774.63	920	772.34	218.30	1.00%	8	0.011	0.001	0.530	0.00	0.945	0.1	0.6
920.1	920	772.34	921	771.61	190.90	0.40%	8	0.011	0.005	0.650	0.02	0.571	0.9	3.3
921.1	921	771.61	922	771.18	65.80	0.70%	8	0.011	0.008	0.750	0.04	0.746	1.1	5.5

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
922.1	922	771.18	923	769.88	241.60	0.50%	8	0.011	0.008	0.760	0.04	0.677	1.2	6.0
923.1	923	769.88	926	768.39	276.80	0.50%	8	0.011	0.010	0.830	0.20	0.677	1.5	29.8
924.1	924	772.09	925	771.24	150.80	0.60%	8	0.011	0.001	0.520	0.00	0.693	0.1	0.6
925.1	925	771.24	926	768.39	150.90	1.90%	8	0.011	0.002	0.540	0.01	1.269	0.1	0.8
926.1	926	768.39	927	767.70	121.10	0.60%	8	0.011	0.016	0.970	0.07	0.697	2.2	10.5
927.1	927	767.70	908	765.22	103.30	2.40%	8	0.011	0.016	0.900	0.06	1.430	1.1	8.3
928.1	928	777.02	929	773.15	198.60	1.90%	8	0.011	0.001	0.530	0.00	1.288	0.1	0.6
929.1	929	773.15	906	766.63	227.90	2.90%	8	0.011	0.003	0.570	0.01	1.561	0.2	1.4
930.1	930	785.07	931	783.83	153.10	0.80%	8	0.011	0.001	0.530	0.00	0.831	0.1	0.6
931.1	931	783.83	903	770.31	313.20	4.30%	8	0.011	0.006	0.650	0.02	1.918	0.3	3.2
932.1	932	785.98	933	785.52	70.50	0.70%	8	0.011	0.002	0.560	0.01	0.745	0.3	1.3
933.1	933	785.52	934	784.53	177.90	0.60%	8	0.011	0.003	0.630	0.02	0.689	0.4	3.1
934.1	934	784.53	931	783.83	119.70	0.60%	8	0.011	0.004	0.630	0.02	0.706	0.6	2.9
935.1	935	781.37	936	780.71	112.70	0.60%	8	0.011	0.001	0.530	0.00	0.707	0.2	0.7
936.1	936	780.71	937	780.12	98.40	0.60%	8	0.011	0.002	0.560	0.01	0.715	0.3	1.4
937.1	937	780.12	1101	779.00	106.50	1.10%	8	0.011	0.003	0.560	0.01	0.946	0.3	1.3
938.1	938	668.45	453	666.79	103.30	1.60%	21	0.011	1.587	6.100	0.39	15.340	10.3	22.4
939.1	939	670.03	938	668.45	151.30	1.00%	10	0.012	0.041	1.380	0.11	1.568	2.6	13.6
940.1	940	670.28	939	670.03	60.60	0.40%	10	0.012	0.041	1.010	0.14	0.985	4.1	17.2
941.1	941	671.08	940	670.28	281.10	0.30%	10	0.012	0.034	0.790	0.23	0.818	4.2	27.6
942.1	942	671.88	941	671.08	279.70	0.30%	10	0.012	0.028	0.740	0.21	0.820	3.3	25.8
943.1	943	673.41	942	671.88	143.80	1.10%	10	0.012	0.022	1.080	0.08	1.582	1.4	9.8
944.1	944	675.05	943	673.41	169.90	1.00%	10	0.012	0.021	1.060	0.08	1.507	1.4	9.5
945.1	945	676.33	944	675.05	474.20	0.30%	10	0.012	0.017	0.850	0.16	0.797	2.2	19.3
946.1	946	673.09	940	670.28	473.40	0.60%	8	0.012	0.001	0.530	0.16	0.652	0.2	24.1
947.1	947	674.19	941	671.08	473.00	0.70%	8	0.012	0.001	0.530	0.18	0.686	0.2	26.6
948.1	948	673.16	942	671.88	474.00	0.30%	8	0.012	0.001	0.530	0.08	0.440	0.3	11.3
949.1	949	678.23	957	676.66	343.00	0.50%	8	0.012	0.004	0.590	0.01	0.572	0.6	1.9
950.1	950	679.33	949	678.23	261.30	0.40%	8	0.012	0.001	0.540	0.11	0.549	0.3	17.2
951.1	951	679.75	954	678.72	86.20	1.20%	8	0.012	0.007	0.670	0.02	0.925	0.7	3.5
952.1	952	684.55	951	679.75	427.40	1.10%	8	0.012	0.002	0.560	0.01	0.897	0.3	1.1
953.1	953	679.54	954	678.72	134.10	0.60%	8	0.012	0.001	0.530	0.00	0.662	0.2	0.7
954.1	954	678.72	955	678.08	95.10	0.70%	10	0.012	0.009	0.810	0.05	1.259	0.7	5.8
955.1	955	678.08	956	676.99	203.40	0.50%	10	0.012	0.009	0.710	0.03	1.123	0.8	3.4
956.1	956	676.99	957	676.66	90.50	0.40%	10	0.012	0.011	0.810	0.05	0.926	1.1	5.4
957.1	957	676.66	945	676.33	92.90	0.40%	10	0.012	0.017	1.010	0.08	0.914	1.9	9.2
958.1	958	675.09	959	673.65	285.60	0.50%	8	0.011	0.000	0.000	0.14	0.655	0.0	21.6
959.1	959	673.65	960	670.45	229.60	1.40%	8	0.011	0.000	0.000	0.00	1.090	0.0	0.0
960.1	960	670.45	938	668.45	233.60	0.90%	8	0.011	0.035	1.320	0.12	0.854	4.0	17.3
961.1	961	655.67	963	654.37	330.30	0.40%	8	0.011	0.032	0.930	0.14	0.579	5.5	20.8

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
962.1	962	655.50	963	654.37	261.50	0.40%	8	0.011	0.003	0.550	0.12	0.607	0.4	17.8
963.1	963	654.37	2438	651.80	333.20	0.80%	8	0.011	0.038	1.300	0.12	0.811	4.7	18.6
964.1	964	649.45	965	644.91	161.50	2.80%	8	0.011	0.002	0.550	0.01	1.547	0.1	0.9
965.1	965	644.91	968	629.71	378.50	4.00%	10	0.011	0.129	2.090	0.83	3.354	3.8	100.0
966.1	966	625.59	LS_SRP1	623.99	60.90	2.60%	10	0.011	0.132	2.190	0.13	2.712	4.9	16.1
967.1	967	627.75	966	625.59	209.60	1.00%	10	0.011	0.132	2.370	0.17	1.699	7.8	20.3
968.1	968	629.71	967	627.75	183.00	1.10%	10	0.011	0.133	2.360	0.17	1.732	7.6	20.1
969.1	969	650.05	965	644.91	365.50	1.40%	10	0.011	0.124	2.220	0.52	1.985	6.3	62.3
970.1	970	651.42	969	650.05	426.20	0.30%	10	0.011	0.117	1.610	0.22	0.949	12.3	25.9
971.1	971	653.80	2438	651.80	277.90	0.70%	10	0.011	0.075	1.750	0.35	1.420	5.3	41.9
972.1	972	654.67	971	653.80	287.60	0.30%	10	0.011	0.074	1.290	0.27	0.920	8.0	32.3
973.1	973	657.65	972	654.67	405.10	0.70%	8	0.011	0.006	0.230	0.11	0.792	0.7	16.3
974.1	974	659.31	973	657.65	265.70	0.60%	8	0.011	0.003	0.610	0.18	0.730	0.5	27.5
975.1	975	655.06	972	654.67	57.10	0.70%	8	0.011	0.000	0.000	0.00	0.763	0.0	0.0
976.1	976	666.53	977	660.40	219.40	2.80%	8	0.011	0.004	0.590	0.01	1.543	0.3	1.7
977.1	977	660.40	978	656.27	400.10	1.00%	8	0.011	0.006	0.640	0.02	0.938	0.6	2.9
978.1	978	656.27	972	654.67	304.20	0.50%	10	0.011	0.057	1.410	0.14	1.214	4.7	17.1
979.1	979	659.07	978	656.27	361.00	0.80%	10	0.011	0.045	1.420	0.32	1.474	3.0	38.5
980.1	980	723.85	981	721.47	445.50	0.50%	10	0.011	0.348	2.240	0.38	1.223	28.4	45.4
981.1	981	721.47	1843	711.94	93.80	10.20%	10	0.011	0.513	5.330	0.17	5.334	9.6	20.6
982.1	982	688.02	983	677.81	500.00	2.00%	10	0.011	0.258	3.460	0.19	2.392	10.8	23.1
983.1	983	677.81	984	663.14	267.60	5.50%	10	0.011	0.325	3.910	0.83	3.918	8.3	100.0
984.1	984	663.14	12	653.54	356.40	2.70%	12	0.011	0.380	4.430	0.88	4.466	8.5	88.4
985.1	985	656.99	1421	656.57	94.40	0.40%	8	0.011	0.011	0.860	0.06	0.616	1.8	8.4
986.1	986	686.84	49	667.50	486.60	4.00%	8	0.011	0.004	0.590	0.67	1.840	0.2	100.0
987.1	987	700.92	48	694.42	266.70	2.40%	8	0.011	0.000	0.000	0.65	1.441	0.0	97.5
988.1	988	684.34	996	675.76	98.90	8.70%	8	0.011	0.007	0.640	0.02	2.718	0.2	2.7
989.1	989	709.12	988	684.34	351.00	7.10%	8	0.011	0.003	0.560	0.67	2.452	0.1	100.0
990.1	990	709.12	989	709.12	240.20	0.00%	8	0.011	0.000	0.000	0.18	0.000	Infinity	26.3
991.1	991	718.80	63	695.01	357.70	6.60%	8	0.011	0.000	0.000	0.67	2.380	0.0	100.0
992.1	992	711.30	993	700.28	494.10	2.20%	8	0.011	0.000	0.290	0.61	1.378	0.0	92.2
993.1	993	700.28	994	693.77	124.70	5.20%	8	0.011	0.005	0.620	0.02	2.109	0.2	2.5
994.1	994	693.77	995	686.80	126.40	5.50%	8	0.011	0.007	0.660	0.02	2.168	0.3	3.1
995.1	995	686.80	996	675.76	170.70	6.50%	8	0.011	0.007	0.660	0.02	2.347	0.3	3.2
996.1	996	675.76	1421	656.57	319.30	6.00%	8	0.011	0.016	0.850	0.05	2.263	0.7	6.9
997.1	997	700.49	1017	697.90	490.60	0.50%	10	0.012	0.163	2.090	0.37	1.115	14.6	44.5
998.1	998	702.05	997	700.49	431.00	0.40%	10	0.012	0.163	1.830	0.25	0.923	17.6	29.9
999.1	999	703.85	998	702.05	481.30	0.40%	10	0.012	0.144	1.780	0.33	0.938	15.3	40.0
1000.1	1000	704.51	999	703.85	172.40	0.40%	10	0.012	0.144	1.820	0.23	0.949	15.2	27.6
1001.1	1001	705.64	1000	704.51	156.10	0.70%	8	0.012	0.138	2.290	0.21	0.720	19.1	31.2

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1002.1	1002	706.92	1001	705.64	201.80	0.60%	8	0.012	0.136	2.180	0.21	0.674	20.1	32.0
1003.1	1003	708.11	1002	706.92	218.10	0.50%	8	0.012	0.110	1.850	0.21	0.625	17.6	30.9
1004.1	1004	709.38	1003	708.11	192.30	0.70%	8	0.012	0.110	1.980	0.20	0.688	15.9	29.4
1005.1	1005	716.31	1004	709.38	462.80	1.50%	8	0.012	0.083	1.830	0.52	1.035	8.0	78.5
1006.1	1006	728.58	1005	716.31	265.60	4.60%	8	0.012	0.087	1.730	0.67	1.818	4.8	100.0
1007.1	1007	733.88	1006	728.58	250.90	2.10%	8	0.012	0.085	1.830	0.66	1.230	6.9	99.6
1008.1	1008	736.09	1007	733.88	163.70	1.40%	8	0.012	0.085	1.890	0.15	0.983	8.6	22.2
1009.1	1009	738.36	1008	736.09	258.10	0.90%	8	0.012	0.084	1.930	0.39	0.794	10.6	58.8
1010.1	1010	741.59	1009	738.36	455.20	0.70%	8	0.012	0.075	1.700	0.35	0.713	10.6	52.0
1011.1	1011	743.20	1010	741.59	298.00	0.50%	8	0.012	0.075	1.540	0.18	0.622	12.0	26.7
1012.1	1012	744.20	1011	743.20	192.10	0.50%	8	0.012	0.075	1.520	0.18	0.611	12.2	27.0
1013.1	1013	746.20	1012	744.20	433.70	0.50%	8	0.012	0.074	1.450	0.18	0.575	12.9	27.7
1014.1	1014	746.79	1013	746.20	145.30	0.40%	8	0.012	0.074	1.390	0.19	0.539	13.7	28.5
1015.1	1015	747.97	1014	746.79	328.70	0.40%	8	0.012	0.073	1.310	0.20	0.507	14.4	29.6
1016.1	1016	748.65	1015	747.97	91.60	0.70%	8	0.012	0.073	1.700	0.16	0.729	10.0	24.4
1017.1	1017	697.90	1018	697.09	406.60	0.20%	21	0.011	0.383	1.920	0.32	5.402	7.1	18.6
1018.1	1018	697.09	1019	695.99	415.00	0.30%	21	0.011	0.395	2.150	0.31	6.231	6.3	17.5
1019.1	1019	695.99	1020	694.90	415.00	0.30%	21	0.011	0.407	2.170	0.31	6.203	6.6	17.8
1020.1	1020	694.90	2158	693.28	409.70	0.40%	21	0.011	0.420	2.530	0.29	7.610	5.5	16.4
1021.1	1021	694.63	2158	693.28	41.90	3.20%	12	0.011	0.774	6.880	0.27	4.886	15.8	27.3
1022.1	1022	691.19	1025	689.55	313.00	0.50%	8	0.011	0.011	0.840	0.05	0.668	1.6	7.7
1023.1	1023	692.49	1022	691.19	245.00	0.50%	8	0.011	0.000	0.000	0.00	0.672	0.0	0.0
1024.1	1024	693.13	1025	689.55	146.10	2.40%	8	0.011	0.000	0.000	0.00	1.445	0.0	0.0
1025.1	1025	689.55	1031	683.52	300.00	2.00%	8	0.011	0.015	0.880	0.05	1.309	1.2	7.9
1026.1	1026	679.20	1033	673.36	232.10	2.50%	8	0.011	0.000	0.000	0.00	1.464	0.0	0.0
1027.1	1027	680.53	2442	666.41	398.20	3.50%	8	0.011	0.021	0.980	0.06	1.738	1.2	9.4
1028.1	1028	675.57	1034	667.19	261.80	3.20%	8	0.011	0.000	0.000	0.67	1.651	0.0	100.0
1029.1	1029	676.28	1032	668.75	242.80	3.10%	8	0.011	0.000	0.000	0.00	1.625	0.0	0.0
1030.1	1030	682.61	1027	680.53	398.20	0.50%	8	0.011	0.018	1.070	0.08	0.667	2.7	12.7
1031.1	1031	683.52	1030	682.61	167.50	0.50%	8	0.011	0.017	1.040	0.08	0.680	2.5	12.3
1032.1	1032	668.75	1034	667.19	299.10	0.50%	8	0.011	0.010	0.820	0.05	0.667	1.5	7.3
1033.1	1033	673.36	1032	668.75	300.00	1.50%	8	0.011	0.005	0.620	0.02	1.144	0.4	2.4
1034.1	1034	667.19	1041	664.97	236.40	0.90%	8	0.011	0.013	0.820	0.05	0.894	1.4	6.8
1035.1	1035	681.55	1033	673.36	300.80	2.70%	8	0.011	0.000	0.000	0.00	1.523	0.0	0.0
1036.1	1036	687.12	1037	680.39	399.80	1.70%	8	0.011	0.000	0.000	0.00	1.198	0.0	0.0
1037.1	1037	680.39	1039	674.27	397.00	1.50%	8	0.011	0.002	0.540	0.44	1.146	0.2	66.3
1038.1	1038	675.60	1032	668.75	301.80	2.30%	8	0.011	0.000	0.000	0.00	1.391	0.0	0.0
1039.1	1039	674.27	1041	664.97	140.80	6.60%	8	0.011	0.004	0.600	0.01	2.372	0.2	2.0
1040.1	1040	678.06	1039	674.27	150.30	2.50%	8	0.011	0.000	0.000	0.00	1.466	0.0	0.0
1041.1	1041	664.97	1072	658.52	324.20	2.00%	8	0.011	0.020	0.990	0.07	1.302	1.5	10.2

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1042.1	1042	739.84	1043	733.20	267.90	2.50%	8	0.012	0.007	0.660	0.67	1.332	0.5	100.0
1043.1	1043	733.20	1044	731.44	230.40	0.80%	8	0.012	0.010	0.790	0.04	0.740	1.4	6.4
1044.1	1044	731.44	1051	724.55	520.70	1.30%	8	0.012	0.013	0.830	0.05	0.973	1.3	6.8
1045.1	1045	746.17	1046	733.72	460.40	2.70%	8	0.012	0.000	0.320	0.67	1.391	0.0	100.0
1046.1	1046	733.72	1048	727.47	276.70	2.30%	8	0.012	0.004	0.580	0.64	1.272	0.3	95.3
1047.1	1047	743.51	1048	727.47	392.80	4.10%	8	0.012	0.001	0.530	0.67	1.710	0.1	100.0
1048.1	1048	727.47	1058	726.23	251.30	0.50%	8	0.012	0.004	0.650	0.15	0.594	0.6	22.4
1048.2	1048	727.47	1049	723.49	262.10	1.50%	8	0.012	0.006	0.580	0.41	1.043	0.6	60.8
1049.1	1049	723.49	1050	719.98	267.70	1.30%	8	0.012	0.007	0.600	0.36	0.969	0.7	54.1
1050.1	1050	719.98	1054	719.30	129.20	0.50%	8	0.012	0.033	1.010	0.13	0.614	5.4	20.2
1051.1	1051	724.55	1050	719.98	269.10	1.70%	8	0.012	0.022	1.020	0.53	1.103	2.0	79.0
1052.1	1052	730.13	1051	724.55	361.90	1.50%	8	0.012	0.000	0.330	0.40	1.051	0.0	60.2
1053.1	1053	718.97	1181	717.39	148.10	1.10%	8	0.012	0.034	1.320	0.11	0.874	3.9	17.0
1054.1	1054	719.30	1053	718.97	64.80	0.50%	8	0.012	0.034	1.000	0.14	0.604	5.6	20.6
1055.1	1055	720.03	1061	716.37	388.50	0.90%	8	0.012	0.004	0.600	0.28	0.821	0.4	41.4
1056.1	1056	727.57	1055	720.03	224.60	3.40%	8	0.012	0.000	0.160	0.00	1.550	0.0	0.3
1057.1	1057	721.00	1055	720.03	174.90	0.60%	8	0.012	0.001	0.530	0.00	0.630	0.2	0.7
1058.1	1058	726.23	1059	724.55	295.90	0.60%	8	0.012	0.014	0.960	0.24	0.638	2.2	35.9
1059.1	1059	724.55	1060	724.29	32.70	0.80%	8	0.012	0.016	0.960	0.07	0.755	2.1	10.1
1060.1	1060	724.29	1005	716.31	401.40	2.00%	8	0.012	0.000	0.000	0.00	1.193	0.0	0.0
1060.2	1060	724.29	1061	716.37	320.40	2.50%	8	0.012	0.016	0.750	0.03	1.330	1.2	4.0
1061.1	1061	716.37	1062	712.13	414.80	1.00%	8	0.012	0.021	0.910	0.05	0.855	2.4	7.4
1062.1	1062	712.13	1002	706.92	251.70	2.10%	8	0.012	0.024	0.980	0.58	1.217	1.9	87.1
1063.1	1063	721.02	1064	718.90	130.70	1.60%	8	0.012	0.000	0.160	0.00	1.077	0.0	0.3
1064.1	1064	718.90	1065	715.12	245.80	1.50%	8	0.012	0.001	0.530	0.00	1.049	0.1	0.7
1065.1	1065	715.12	1000	704.51	280.10	3.80%	8	0.012	0.003	0.580	0.67	1.647	0.2	100.0
1066.1	1066	684.52	1067	682.45	217.70	1.00%	8	0.011	0.004	0.610	0.02	0.900	0.5	2.3
1067.1	1067	682.45	2442	666.41	140.90	11.40%	8	0.011	0.007	0.630	0.02	3.114	0.2	2.3
1068.1	1068	665.15	979	659.07	308.60	2.00%	8	0.011	0.035	1.260	0.10	1.296	2.7	14.6
1069.1	1069	665.73	1068	665.15	149.10	0.40%	8	0.011	0.001	0.530	0.00	0.576	0.2	0.7
1070.1	1070	675.77	1071	669.14	324.60	2.00%	8	0.011	0.003	0.600	0.02	1.319	0.2	2.3
1071.1	1071	669.14	979	659.07	396.90	2.50%	8	0.011	0.005	0.620	0.67	1.470	0.4	100.0
1072.1	1072	658.52	2476	656.02	309.10	0.80%	8	0.011	0.025	1.180	0.10	0.830	3.0	14.6
1073.1	1073	674.98	1072	658.52	379.00	4.30%	8	0.011	0.001	0.530	0.67	1.923	0.1	100.0
1074.1	1074	672.40	1075	668.01	488.10	0.90%	8	0.011	0.000	0.000	0.24	0.875	0.0	36.6
1075.1	1075	668.01	961	655.67	410.50	3.00%	8	0.011	0.003	0.560	0.01	1.600	0.2	1.3
1076.1	1076	671.00	1075	668.01	91.70	3.30%	8	0.011	0.000	0.000	0.00	1.667	0.0	0.0
1077.1	1077	667.50	1078	656.03	272.70	4.20%	8	0.011	0.001	0.530	0.67	1.893	0.1	100.0
1078.1	1078	656.03	969	650.05	263.60	2.30%	8	0.011	0.003	0.610	0.62	1.390	0.2	92.3
1079.1	1079	779.00	1080	775.00	171.40	2.30%	8	0.011	0.000	0.000	0.00	1.410	0.0	0.0

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1080.1	1080	775.00	1081	773.40	291.50	0.50%	8	0.011	0.007	0.700	0.19	0.684	1.0	28.5
1081.1	1081	773.40	1086	772.00	206.00	0.70%	8	0.011	0.013	0.870	0.05	0.761	1.7	8.0
1082.1	1082	764.00	1087	762.40	227.60	0.70%	8	0.011	0.019	1.020	0.07	0.774	2.4	11.2
1083.1	1083	766.00	1082	764.00	167.00	1.20%	8	0.011	0.019	0.940	0.06	1.010	1.9	8.9
1084.1	1084	767.00	1083	766.00	62.30	1.60%	8	0.011	0.016	0.920	0.06	1.169	1.4	8.7
1085.1	1085	769.00	1084	767.00	153.20	1.30%	8	0.011	0.016	0.870	0.05	1.055	1.5	7.4
1086.1	1086	772.00	1085	769.00	193.40	1.60%	8	0.011	0.016	0.900	0.06	1.150	1.4	8.5
1087.1	1087	762.40	1088	758.00	216.30	2.00%	8	0.011	0.021	1.010	0.07	1.316	1.6	10.4
1088.1	1088	758.00	1089	756.40	282.50	0.60%	8	0.011	0.022	1.130	0.25	0.695	3.2	38.1
1089.1	1089	756.40	1090	754.40	130.10	1.50%	8	0.011	0.162	2.660	0.18	1.145	14.1	27.2
1090.1	1090	754.40	1091	752.40	120.30	1.70%	8	0.011	0.163	2.650	0.18	1.190	13.7	26.7
1091.1	1091	752.40	1092	745.73	195.90	3.40%	12	0.011	0.172	2.500	0.13	5.022	3.4	13.3
1092.1	1092	745.73	1094	743.88	179.20	1.00%	12	0.011	0.292	3.360	0.23	2.765	10.5	22.7
1093.1	1093	748.00	1092	745.73	249.90	0.90%	8	0.011	0.118	2.320	0.41	0.880	13.4	61.1
1094.1	1094	743.88	1132	739.22	466.90	1.00%	12	0.011	0.293	3.320	0.49	2.719	10.8	48.9
1095.1	1095	761.00	1096	757.00	277.60	1.40%	8	0.011	0.000	0.000	0.40	1.108	0.0	60.0
1096.1	1096	757.00	1091	752.40	450.40	1.00%	8	0.011	0.004	0.570	0.26	0.933	0.4	39.7
1097.1	1097	779.00	1099	777.90	74.10	1.50%	8	0.011	0.000	0.000	0.00	1.125	0.0	0.0
1098.1	1098	780.00	1099	777.90	176.70	1.20%	8	0.011	0.002	0.540	0.01	1.006	0.2	0.8
1099.1	1099	777.90	1100	776.69	223.30	0.50%	8	0.011	0.004	0.650	0.02	0.679	0.6	3.5
1100.1	1100	776.69	1103	776.11	96.00	0.60%	8	0.011	0.009	0.770	0.04	0.718	1.2	6.0
1101.1	1101	779.00	1100	776.69	160.40	1.40%	8	0.011	0.003	0.570	0.01	1.108	0.3	1.3
1102.1	1102	779.00	1105	774.00	164.50	3.00%	8	0.011	0.000	0.500	0.00	1.609	0.0	0.5
1103.1	1103	776.11	1104	774.80	242.60	0.50%	8	0.011	0.009	0.830	0.05	0.678	1.4	7.7
1104.1	1104	774.80	1105	774.00	132.40	0.60%	8	0.011	0.011	0.850	0.05	0.717	1.5	8.1
1105.1	1105	774.00	1106	772.31	312.50	0.50%	8	0.011	0.013	0.900	0.06	0.679	1.9	9.0
1106.1	1106	772.31	1108	771.60	122.50	0.60%	8	0.011	0.020	1.080	0.09	0.703	2.8	12.9
1107.1	1107	775.00	1106	772.31	168.20	1.60%	8	0.011	0.003	0.610	0.02	1.167	0.2	2.8
1108.1	1108	771.60	1109	770.63	171.80	0.60%	8	0.011	0.020	1.000	0.10	0.694	2.9	14.3
1109.1	1109	770.63	1110	769.57	192.00	0.60%	8	0.011	0.023	0.960	0.11	0.686	3.4	16.4
1110.1	1110	769.57	1111	763.90	301.30	1.90%	8	0.011	0.024	1.100	0.08	1.266	1.9	12.4
1111.1	1111	763.90	1112	763.21	119.10	0.60%	8	0.011	0.027	0.980	0.12	0.703	3.8	17.9
1112.1	1112	763.21	1113	761.80	255.50	0.60%	8	0.011	0.029	1.110	0.22	0.686	4.3	32.5
1113.1	1113	761.80	1114	761.00	92.90	0.90%	8	0.011	0.112	2.260	0.18	0.857	13.1	26.8
1114.1	1114	761.00	1120	759.00	386.00	0.50%	8	0.011	0.113	1.920	0.35	0.664	17.0	52.1
1115.1	1115	772.00	1112	763.21	85.00	10.30%	8	0.011	0.001	0.530	0.00	2.968	0.0	0.6
1116.1	1116	762.20	1113	761.80	144.70	0.30%	8	0.011	0.082	1.340	0.21	0.485	16.8	31.5
1117.1	1117	762.45	1116	762.20	187.30	0.10%	8	0.011	0.079	1.040	0.25	0.337	23.5	37.2
1118.1	1118	770.00	1119	768.90	420.70	0.30%	8	0.011	0.001	0.530	0.00	0.472	0.2	0.7
1119.1	1119	768.90	1120	759.00	362.00	2.70%	8	0.011	0.008	0.420	0.67	1.526	0.5	100.0

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1120.1	1120	759.00	1121	757.90	137.90	0.80%	8	0.011	0.133	2.390	0.20	0.824	16.1	29.4
1121.1	1121	757.90	1089	756.40	265.90	0.60%	8	0.011	0.135	2.140	0.37	0.693	19.5	54.8
1122.1	1122	764.85	1087	762.40	87.70	2.80%	8	0.011	0.001	0.520	0.00	1.543	0.0	0.5
1123.1	1123	770.06	1083	766.00	225.00	1.80%	8	0.011	0.000	0.500	0.00	1.240	0.0	0.5
1124.1	1124	780.00	1125	778.90	130.10	0.80%	8	0.011	0.000	0.500	0.00	0.849	0.0	0.5
1125.1	1125	778.90	1126	776.48	196.20	1.20%	8	0.011	0.001	0.530	0.00	1.025	0.1	0.7
1126.1	1126	776.48	1081	773.40	60.60	5.10%	8	0.011	0.003	0.580	0.01	2.080	0.2	1.7
1127.1	1127	780.00	1128	779.00	165.60	0.60%	8	0.011	0.001	0.530	0.00	0.717	0.1	0.7
1128.1	1128	779.00	1080	775.00	313.10	1.30%	8	0.011	0.003	0.560	0.01	1.043	0.3	0.9
1129.1	1129	727.76	1135	723.65	400.40	1.00%	12	0.012	0.297	3.170	0.24	2.527	11.8	24.0
1130.1	1130	729.83	1129	727.76	197.90	1.00%	12	0.011	0.296	3.390	0.23	2.783	10.6	22.8
1131.1	1131	734.44	1130	729.83	452.10	1.00%	12	0.011	0.296	3.350	0.49	2.748	10.8	48.6
1132.1	1132	739.22	1131	734.44	456.20	1.00%	12	0.011	0.294	3.380	0.49	2.785	10.6	49.3
1133.1	1133	716.32	2063	714.67	13.20	12.50%	12	0.012	0.298	3.460	0.13	8.830	3.4	12.9
1134.1	1134	719.64	1133	716.32	302.70	1.10%	12	0.012	0.298	3.240	0.24	2.612	11.4	23.7
1135.1	1135	723.65	1134	719.64	398.30	1.00%	12	0.012	0.298	3.150	0.24	2.503	11.9	24.1
1136.1	1136	740.04	150	729.80	480.90	2.10%	8	0.013	0.002	0.570	0.58	1.140	0.2	86.8
1137.1	1137	735.43	149	725.31	478.10	2.10%	8	0.013	0.004	0.580	0.57	1.136	0.3	85.8
1138.1	1138	724.06	LS_BM	712.50	116.10	10.00%	8	0.013	0.012	0.850	0.05	2.464	0.5	7.7
1139.1	1139	741.73	156	741.50	36.70	0.60%	8	0.013	0.030	0.940	0.13	0.618	4.8	19.6
1140.1	1140	772.17	1142	771.51	112.00	0.60%	6	0.013	0.000	0.000	0.00	0.278	0.0	0.0
1141.1	1141	770.64	321	770.16	94.30	0.50%	6	0.013	0.000	0.000	0.00	0.259	0.0	0.0
1142.1	1142	771.51	1141	770.64	155.00	0.60%	6	0.013	0.000	0.000	0.00	0.272	0.0	0.0
1143.1	1143	713.50	1144	712.56	280.30	0.30%	12	0.012	0.695	2.750	0.59	1.445	48.1	59.2
1144.1	1144	712.56	1145	711.01	169.80	0.90%	12	0.012	0.697	3.980	0.38	2.384	29.2	37.7
1145.1	1145	711.01	1146	707.80	409.90	0.80%	12	0.012	0.699	3.770	0.39	2.207	31.7	39.3
1146.1	1146	707.80	1147	706.48	215.30	0.60%	12	0.012	0.701	3.450	0.42	1.953	35.9	42.1
1147.1	1147	706.48	1148	705.50	201.10	0.50%	12	0.012	0.702	3.170	0.45	1.741	40.3	45.0
1148.1	1148	705.50	1149	704.49	191.20	0.50%	12	0.012	0.702	3.270	0.44	1.813	38.7	44.0
1149.1	1149	704.49	2437	701.89	299.50	0.90%	12	0.012	0.703	3.920	0.38	2.324	30.3	38.4
1150.1	1150	703.60	2160	699.48	499.30	0.80%	12	0.011	0.132	2.310	0.17	2.472	5.3	17.0
1151.1	1151	707.94	2162	707.40	108.90	0.50%	8	0.012	0.059	1.340	0.17	0.596	10.0	25.0
1152.1	1152	708.73	1151	707.94	138.40	0.60%	8	0.012	0.059	1.410	0.16	0.639	9.2	24.1
1153.1	1153	710.40	1152	708.73	318.60	0.50%	8	0.012	0.016	1.020	0.08	0.613	2.5	11.9
1154.1	1154	711.01	1153	710.40	96.40	0.60%	8	0.012	0.015	0.960	0.07	0.673	2.2	10.3
1155.1	1155	711.69	1154	711.01	120.70	0.60%	8	0.012	0.001	0.530	0.00	0.635	0.2	0.7
1156.1	1156	710.29	1152	708.73	291.50	0.50%	8	0.012	0.038	1.090	0.30	0.619	6.2	44.7
1157.1	1157	711.63	1156	710.29	247.70	0.50%	8	0.012	0.027	0.940	0.26	0.622	4.3	38.4
1158.1	1158	712.72	1157	711.63	198.20	0.50%	8	0.012	0.011	0.860	0.05	0.627	1.8	8.0
1159.1	1159	713.89	1158	712.72	213.50	0.50%	8	0.012	0.009	0.810	0.05	0.626	1.5	7.2

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1160.1	1160	715.08	1159	713.89	212.50	0.60%	8	0.012	0.006	0.720	0.03	0.633	1.0	5.1
1161.1	1161	714.77	1162	713.80	174.40	0.60%	8	0.012	0.002	0.560	0.01	0.631	0.3	1.4
1162.1	1162	713.80	1157	711.63	414.60	0.50%	8	0.012	0.010	0.880	0.06	0.612	1.6	9.0
1163.1	1163	720.73	1162	713.80	283.80	2.40%	8	0.012	0.004	0.580	0.67	1.322	0.3	100.0
1164.1	1164	728.51	1163	720.73	128.60	6.00%	8	0.012	0.004	0.590	0.01	2.081	0.2	1.9
1165.1	1165	727.63	1166	722.83	235.50	2.00%	8	0.012	0.001	0.520	0.00	1.208	0.0	0.5
1166.1	1166	722.83	1160	715.08	335.90	2.30%	8	0.012	0.003	0.560	0.01	1.285	0.3	1.0
1167.1	1167	733.42	1164	728.51	480.80	1.00%	8	0.012	0.001	0.520	0.28	0.855	0.1	41.5
1168.1	1168	704.20	1150	703.60	163.60	0.40%	12	0.012	0.070	1.260	0.17	1.511	4.6	16.6
1169.1	1169	704.98	1168	704.20	224.90	0.30%	12	0.012	0.070	1.250	0.17	1.469	4.7	16.7
1170.1	1170	707.60	1169	704.98	128.30	2.00%	8	0.012	0.001	0.520	0.00	1.209	0.1	0.6
1171.1	1171	706.45	1169	704.98	463.20	0.30%	12	0.012	0.062	1.120	0.25	1.405	4.4	24.8
1172.1	1172	707.66	1171	706.45	370.40	0.30%	12	0.012	0.059	1.100	0.25	1.426	4.1	24.8
1173.1	1173	709.15	1172	707.66	290.90	0.50%	8	0.012	0.055	1.300	0.31	0.606	9.0	46.5
1174.1	1174	715.80	1173	709.15	95.50	7.00%	8	0.012	0.001	0.520	0.00	2.232	0.0	0.5
1175.1	1175	712.51	1154	711.01	281.60	0.50%	8	0.012	0.011	0.890	0.21	0.618	1.7	31.6
1176.1	1176	717.50	1175	712.51	112.10	4.50%	8	0.012	0.001	0.520	0.00	1.785	0.0	0.5
1177.1	1177	729.50	1184	718.50	326.20	3.40%	8	0.012	0.001	0.530	0.00	1.554	0.1	0.6
1178.1	1178	728.50	1179	713.25	378.70	4.00%	8	0.012	0.001	0.520	0.67	1.698	0.0	100.0
1179.1	1179	713.25	1156	710.29	570.90	0.50%	8	0.012	0.004	0.740	0.18	0.609	0.7	26.4
1180.1	1180	716.73	1183	710.96	572.40	1.00%	8	0.012	0.038	1.380	0.38	0.850	4.5	57.4
1181.1	1181	717.39	1180	716.73	110.20	0.60%	8	0.012	0.034	1.070	0.13	0.655	5.2	19.9
1182.1	1182	714.69	1183	710.96	192.50	1.90%	8	0.012	0.004	0.650	0.02	1.178	0.3	3.6
1183.1	1183	710.96	1173	709.15	427.50	0.40%	8	0.012	0.049	1.160	0.16	0.551	8.9	24.3
1184.1	1184	718.50	1175	712.51	211.90	2.80%	8	0.012	0.008	0.740	0.04	1.422	0.5	5.4
1185.1	1185	708.78	1172	707.66	203.00	0.60%	8	0.012	0.000	0.170	0.00	0.628	0.0	0.3
1186.1	1186	711.21	1192	708.89	463.30	0.50%	8	0.012	0.002	0.600	0.14	0.599	0.4	21.7
1187.1	1187	713.00	1186	711.21	278.10	0.60%	8	0.012	0.000	0.320	0.18	0.679	0.0	27.3
1188.1	1188	724.00	1184	718.50	214.10	2.60%	8	0.012	0.003	0.590	0.01	1.356	0.2	1.9
1189.1	1189	729.00	1188	724.00	302.80	1.70%	8	0.012	0.001	0.520	0.00	1.087	0.0	0.5
1190.1	1190	731.00	1180	716.73	366.10	3.90%	8	0.012	0.001	0.530	0.67	1.670	0.0	100.0
1191.1	1191	706.58	998	702.05	176.70	2.60%	8	0.012	0.019	0.960	0.06	1.355	1.4	9.5
1192.1	1192	708.89	1191	706.58	444.60	0.50%	8	0.012	0.005	0.690	0.03	0.610	0.9	4.6
1193.1	1193	710.54	1194	708.63	124.70	1.50%	8	0.012	0.002	0.540	0.00	1.047	0.1	0.7
1194.1	1194	708.63	1191	706.58	234.70	0.90%	8	0.012	0.009	0.760	0.04	0.791	1.2	5.7
1195.1	1195	717.00	1196	712.60	221.10	2.00%	8	0.012	0.000	0.320	0.00	1.194	0.0	0.4
1196.1	1196	712.60	1197	710.07	300.10	0.80%	8	0.012	0.002	0.570	0.01	0.777	0.3	1.5
1197.1	1197	710.07	1194	708.63	267.20	0.50%	8	0.012	0.006	0.720	0.18	0.621	0.9	26.7
1198.1	1198	713.41	1183	710.96	468.10	0.50%	8	0.012	0.000	0.500	0.14	0.612	0.1	20.9
1199.1	1199	711.02	1197	710.07	330.00	0.30%	8	0.012	0.000	0.320	0.00	0.454	0.1	0.4

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1200.1	1200	653.26	427	653.12	10.70	1.30%	8	0.012	0.136	2.470	0.18	0.968	14.1	27.4
1201.1	1201	654.78	1200	653.26	400.10	0.40%	8	0.012	0.107	1.590	0.23	0.522	20.6	34.0
1202.1	1202	656.13	1201	654.78	340.10	0.40%	8	0.012	0.107	1.600	0.22	0.533	20.1	33.7
1203.1	1203	677.12	1204	674.45	267.20	1.00%	8	0.012	0.001	0.530	0.27	0.846	0.1	40.7
1204.1	1204	674.45	1205	673.54	91.00	1.00%	8	0.012	0.003	0.570	0.01	0.846	0.3	1.4
1205.1	1205	673.54	1206	668.23	409.30	1.30%	8	0.012	0.004	0.600	0.01	0.964	0.4	1.9
1206.1	1206	668.23	1222	667.01	232.80	0.50%	8	0.012	0.013	0.920	0.06	0.612	2.1	9.6
1207.1	1207	675.84	1208	672.68	395.00	0.80%	8	0.012	0.000	0.000	0.23	0.757	0.0	33.9
1208.1	1208	672.68	1206	668.23	323.20	1.40%	8	0.012	0.003	0.550	0.01	0.993	0.3	0.9
1209.1	1209	672.99	1217	671.03	307.40	0.60%	8	0.012	0.002	0.540	0.00	0.676	0.2	0.7
1210.1	1210	672.29	1211	671.91	63.80	0.60%	8	0.012	0.000	0.250	0.00	0.653	0.0	0.4
1211.1	1211	671.91	1212	671.27	106.10	0.60%	8	0.012	0.000	0.510	0.00	0.657	0.1	0.5
1212.1	1212	671.27	1213	669.22	409.40	0.50%	8	0.012	0.002	0.570	0.01	0.599	0.4	1.6
1213.1	1213	669.22	1214	667.17	409.60	0.50%	8	0.012	0.006	0.700	0.03	0.599	0.9	4.7
1214.1	1214	667.17	1215	663.07	422.40	1.00%	8	0.012	0.009	0.730	0.03	0.834	1.0	5.0
1215.1	1215	663.07	459	661.85	127.70	1.00%	8	0.012	0.025	1.160	0.09	0.827	3.0	13.9
1216.1	1216	664.24	1215	663.07	292.30	0.40%	8	0.012	0.012	0.860	0.19	0.535	2.3	28.8
1217.1	1217	671.03	1218	669.71	352.40	0.40%	8	0.012	0.003	0.620	0.11	0.518	0.6	17.1
1218.1	1218	669.71	1219	666.44	420.10	0.80%	8	0.012	0.006	0.670	0.03	0.747	0.8	3.8
1219.1	1219	666.44	1216	664.24	299.60	0.70%	8	0.012	0.011	0.850	0.05	0.725	1.5	7.9
1220.1	1220	667.25	1219	666.44	181.90	0.40%	8	0.012	0.002	0.540	0.00	0.565	0.3	0.7
1221.1	1221	667.23	448	663.00	356.40	1.20%	8	0.012	0.000	0.380	0.31	0.922	0.0	45.8
1222.1	1222	667.01	1223	665.37	329.50	0.50%	8	0.012	0.014	0.950	0.08	0.597	2.4	11.8
1223.1	1223	665.37	468	662.83	304.40	0.80%	8	0.012	0.020	1.090	0.09	0.773	2.6	13.0
1224.1	1224	673.90	1225	666.24	195.30	3.90%	8	0.012	0.001	0.530	0.00	1.676	0.1	0.7
1225.1	1225	666.24	1226	660.52	338.40	1.70%	8	0.012	0.003	0.550	0.01	1.100	0.3	0.9
1226.1	1226	660.52	1227	659.30	71.00	1.70%	8	0.012	0.006	0.620	0.01	1.109	0.5	2.2
1227.1	1227	659.30	1228	658.07	308.50	0.40%	8	0.012	0.014	0.840	0.08	0.534	2.6	12.5
1228.1	1228	658.07	1229	656.87	299.60	0.40%	8	0.012	0.021	0.800	0.12	0.536	4.0	17.5
1229.1	1229	656.87	1230	656.35	130.40	0.40%	8	0.012	0.029	0.840	0.14	0.534	5.4	20.7
1230.1	1230	656.35	1235	655.23	283.00	0.40%	8	0.012	0.029	0.820	0.25	0.532	5.5	38.1
1231.1	1231	669.31	1233	665.18	243.70	1.70%	8	0.012	0.002	0.540	0.01	1.102	0.2	0.8
1232.1	1232	670.69	1234	664.24	293.60	2.20%	8	0.012	0.002	0.580	0.66	1.254	0.2	98.6
1233.1	1233	665.18	1228	658.07	325.00	2.20%	8	0.012	0.003	0.570	0.01	1.251	0.3	1.2
1234.1	1234	664.24	1229	656.87	275.30	2.70%	8	0.012	0.004	0.610	0.67	1.384	0.3	100.0
1235.1	1235	655.23	1200	653.26	512.50	0.40%	8	0.012	0.029	0.830	0.14	0.525	5.6	21.3
1236.1	1236	664.77	2362	663.91	185.40	0.50%	8	0.012	0.002	0.540	0.00	0.576	0.3	0.7
1237.1	1237	662.26	1238	661.93	84.40	0.40%	8	0.012	0.006	0.740	0.04	0.529	1.2	5.7
1238.1	1238	661.93	1227	659.30	289.90	0.90%	8	0.012	0.008	0.730	0.30	0.806	1.0	44.6
1239.1	1239	672.23	583	668.60	353.90	1.00%	8	0.011	0.008	0.700	0.29	0.935	0.9	43.1

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1240.1	1240	673.58	1239	672.23	257.10	0.50%	8	0.011	0.007	0.730	0.17	0.669	1.0	25.4
1241.1	1241	675.84	1240	673.58	293.30	0.80%	8	0.011	0.006	0.660	0.25	0.810	0.7	37.5
1242.1	1242	692.62	1241	675.84	400.20	4.20%	8	0.011	0.004	0.600	0.01	1.890	0.2	1.9
1243.1	1243	699.84	1242	692.62	399.20	1.80%	8	0.011	0.002	0.540	0.01	1.241	0.1	0.8
1244.1	1244	707.02	1243	699.84	285.50	2.50%	8	0.011	0.001	0.520	0.67	1.464	0.0	100.0
1245.1	1245	684.97	577	670.17	293.90	5.00%	8	0.011	0.011	0.750	0.67	2.071	0.5	100.0
1246.1	1246	687.69	1245	684.97	306.40	0.90%	8	0.011	0.005	0.640	0.02	0.870	0.6	2.9
1247.1	1247	693.60	1246	687.69	139.90	4.20%	8	0.011	0.000	0.000	0.00	1.897	0.0	0.0
1248.1	1248	706.00	1249	696.92	314.60	2.90%	8	0.011	0.001	0.520	0.00	1.568	0.0	0.5
1249.1	1249	696.92	1246	687.69	476.10	1.90%	8	0.011	0.002	0.590	0.53	1.285	0.2	79.0
1250.1	1250	703.25	1251	690.27	449.90	2.90%	8	0.011	0.001	0.520	0.67	1.568	0.0	100.0
1251.1	1251	690.27	1245	684.97	435.60	1.20%	8	0.011	0.003	0.560	0.01	1.018	0.3	1.2
1252.1	1252	620.60	LS_SRP1	620.54	26.70	0.20%	27	0.011	0.980	2.820	0.43	11.205	8.7	19.3
1253.1	1253	621.00	1252	620.60	159.20	0.30%	27	0.011	0.978	2.770	0.44	11.859	8.2	19.5
1254.1	1254	630.59	1253	621.00	578.10	1.70%	27	0.011	0.970	5.100	0.72	30.467	3.2	32.1
1255.1	1255	645.21	1254	630.59	705.70	2.10%	27	0.011	0.958	5.730	0.26	34.047	2.8	11.6
1256.1	1256	645.68	1255	645.21	182.60	0.30%	27	0.011	0.948	2.750	0.43	12.001	7.9	19.2
1257.1	1257	649.42	875	647.93	387.30	0.40%	27	0.011	0.769	2.950	0.46	14.671	5.2	20.5
1258.1	1258	688.89	2131	687.77	300.00	0.40%	8	0.011	0.009	0.850	0.05	0.564	1.6	8.2
1259.1	1259	691.09	1258	688.89	300.60	0.70%	8	0.011	0.009	0.770	0.04	0.790	1.2	6.1
1260.1	1260	697.45	1259	691.09	417.30	1.50%	8	0.011	0.000	0.000	0.00	1.140	0.0	0.0
1261.1	1261	701.12	1260	697.45	238.30	1.50%	8	0.011	0.000	0.000	0.00	1.146	0.0	0.0
1262.1	1262	678.74	32	673.90	49.80	9.70%	12	0.011	0.053	1.230	0.06	8.484	0.6	6.4
1263.1	1263	678.98	1262	678.74	34.70	0.70%	12	0.011	0.053	1.490	0.12	2.264	2.3	12.2
1264.1	1264	680.32	1263	678.98	309.00	0.40%	12	0.011	0.053	1.260	0.14	1.792	3.0	13.7
1265.1	1265	680.74	1264	680.32	76.00	0.60%	12	0.011	0.053	1.360	0.13	2.023	2.6	13.0
1266.1	1266	682.44	1265	680.74	411.40	0.40%	12	0.011	0.053	1.240	0.14	1.749	3.0	13.9
1267.1	1267	684.63	2436	683.21	304.50	0.50%	12	0.011	0.046	1.180	0.13	1.858	2.5	12.9
1268.1	1268	686.66	1267	684.63	373.80	0.50%	12	0.011	0.046	1.230	0.27	2.005	2.3	27.1
1269.1	1269	689.15	1268	686.66	345.90	0.70%	12	0.011	0.046	1.370	0.12	2.309	2.0	11.7
1270.1	1270	692.32	1269	689.15	437.60	0.70%	12	0.011	0.046	1.360	0.12	2.316	2.0	11.7
1271.1	1271	694.39	1270	692.32	394.80	0.50%	12	0.011	0.046	1.210	0.27	1.970	2.3	27.5
1272.1	1272	696.58	1271	694.39	297.40	0.70%	12	0.011	0.046	1.380	0.34	2.335	1.9	33.6
1273.1	1273	699.83	1272	696.58	314.50	1.00%	12	0.011	0.046	1.380	0.11	2.766	1.6	10.6
1274.1	1274	701.86	1273	699.83	387.60	0.50%	12	0.011	0.046	1.210	0.27	1.969	2.3	27.2
1275.1	1275	703.79	1274	701.86	365.30	0.50%	12	0.011	0.046	1.210	0.27	1.978	2.3	26.5
1276.1	1276	704.33	1275	703.79	89.10	0.60%	12	0.011	0.046	1.270	0.12	2.119	2.1	12.3
1277.1	1277	706.71	1276	704.33	459.70	0.50%	12	0.011	0.046	1.210	0.26	1.958	2.3	26.0
1280.1	1280	673.62	1281	663.95	370.60	2.60%	8	0.011	0.001	0.530	0.67	1.491	0.1	100.0
1281.1	1281	663.95	1282	653.40	122.40	8.60%	8	0.011	0.004	0.580	0.01	2.710	0.1	1.6

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1282.1	1282	653.40	2192	652.02	467.00	0.30%	18	0.011	1.370	3.340	0.66	4.361	31.4	43.9
1283.1	1283	719.48	LS_BM	712.50	34.70	20.10%	8	0.013	0.001	0.530	0.00	3.500	0.0	0.7
1284.1	1284	721.00	1283	719.48	265.00	0.60%	8	0.013	0.001	0.530	0.16	0.592	0.2	23.5
1285.1	1285	723.71	1284	721.00	521.20	0.50%	8	0.013	0.000	0.000	0.00	0.563	0.0	0.0
1286.1	1286	776.00	1287	773.00	169.90	1.80%	8	0.012	0.001	0.530	0.00	1.124	0.1	0.7
1287.1	1287	773.00	1288	771.00	320.90	0.60%	8	0.012	0.002	0.580	0.01	0.668	0.3	2.0
1288.1	1288	771.00	1289	764.00	392.90	1.80%	8	0.012	0.003	0.610	0.52	1.129	0.3	77.6
1289.1	1289	764.00	1290	758.00	308.40	1.90%	8	0.012	0.016	0.930	0.06	1.180	1.4	9.1
1290.1	1290	758.00	1291	749.00	288.00	3.10%	8	0.012	0.018	0.900	0.67	1.496	1.2	100.0
1291.1	1291	749.00	1292	742.00	462.70	1.50%	8	0.012	0.020	0.970	0.45	1.041	1.9	68.0
1292.1	1292	742.00	1293	734.00	396.60	2.00%	8	0.012	0.021	1.030	0.64	1.202	1.8	96.6
1293.1	1293	734.00	1294	733.03	36.50	2.70%	8	0.012	0.037	1.260	0.09	1.379	2.7	14.1
1294.1	1294	733.03	2174	728.00	291.80	1.70%	8	0.012	0.038	1.330	0.61	1.111	3.5	91.6
1295.1	1295	718.18	1296	716.68	289.40	0.50%	8	0.012	0.055	1.310	0.31	0.609	9.0	46.7
1296.1	1296	716.68	1297	715.23	288.80	0.50%	8	0.012	0.061	1.350	0.31	0.600	10.1	47.0
1297.1	1297	715.23	1298	713.02	256.30	0.90%	8	0.012	0.063	1.680	0.37	0.786	8.0	55.5
1298.1	1298	713.02	348	710.86	452.60	0.50%	8	0.015	0.118	1.520	0.37	0.468	25.3	55.7
1299.1	1299	735.00	1294	733.03	131.00	1.50%	8	0.012	0.000	0.440	0.00	1.038	0.0	0.5
1300.1	1300	780.00	1301	776.00	137.40	2.90%	8	0.012	0.001	0.530	0.00	1.444	0.1	0.7
1301.1	1301	776.00	1302	772.00	446.10	0.90%	8	0.012	0.002	0.560	0.01	0.801	0.3	1.3
1302.1	1302	772.00	2172	769.00	274.70	1.10%	8	0.012	0.008	0.730	0.33	0.884	0.9	49.9
1303.1	1303	775.00	1288	771.00	230.30	1.70%	8	0.012	0.000	0.290	0.00	1.115	0.0	0.4
1304.1	1304	740.00	1305	732.00	297.40	2.70%	8	0.012	0.001	0.530	0.67	1.388	0.1	100.0
1305.1	1305	732.00	2174	728.00	301.90	1.30%	8	0.012	0.002	0.550	0.01	0.974	0.2	0.8
1306.1	1306	739.33	1308	728.00	500.20	2.30%	8	0.012	0.001	0.530	0.00	1.273	0.1	0.7
1307.1	1307	740.73	1306	739.33	57.80	2.40%	8	0.012	0.000	0.290	0.00	1.317	0.0	0.4
1308.1	1308	728.00	1296	716.68	325.00	3.50%	8	0.012	0.003	0.550	0.01	1.579	0.2	0.9
1309.1	1309	742.00	1310	733.78	432.10	1.90%	8	0.012	0.000	0.290	0.00	1.167	0.0	0.4
1310.1	1310	733.78	1311	721.86	270.50	4.40%	8	0.012	0.003	0.570	0.67	1.776	0.2	100.0
1311.1	1311	721.86	1314	720.49	253.50	0.50%	8	0.012	0.007	0.760	0.18	0.622	1.1	26.6
1312.1	1312	727.95	1311	721.86	290.20	2.10%	8	0.012	0.002	0.540	0.61	1.226	0.2	92.2
1313.1	1313	729.44	1312	727.95	278.20	0.50%	8	0.012	0.001	0.530	0.15	0.619	0.1	23.0
1314.1	1314	720.49	1295	718.18	370.20	0.60%	8	0.012	0.008	0.760	0.20	0.668	1.2	30.6
1315.1	1315	719.77	1297	715.23	282.40	1.60%	8	0.012	0.000	0.440	0.46	1.073	0.0	68.6
1316.1	1316	738.58	1317	738.00	15.90	3.70%	8	0.012	0.004	0.590	0.01	1.618	0.3	1.9
1317.1	1317	738.00	1293	734.00	289.70	1.40%	8	0.012	0.014	0.850	0.45	0.994	1.4	67.2
1318.1	1318	744.00	1317	738.00	275.50	2.20%	8	0.012	0.009	0.740	0.63	1.249	0.7	94.9
1319.1	1319	754.00	1318	744.00	288.80	3.50%	8	0.012	0.005	0.650	0.67	1.574	0.3	100.0
1320.1	1320	754.50	1319	754.00	288.10	0.20%	8	0.012	0.003	0.690	0.08	0.352	0.9	12.4
1321.1	1321	766.50	1320	754.50	412.40	2.90%	8	0.012	0.001	0.530	0.00	1.443	0.1	0.7

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1322.1	1322	767.38	1321	766.50	130.40	0.70%	8	0.012	0.000	0.520	0.00	0.695	0.1	0.5
1323.1	1323	765.10	1330	757.10	487.30	1.60%	8	0.012	0.001	0.520	0.45	1.084	0.0	67.2
1324.1	1324	760.06	1325	746.76	331.50	4.00%	8	0.012	0.000	0.440	0.00	1.695	0.0	0.5
1325.1	1325	746.76	1318	744.00	271.10	1.00%	8	0.012	0.002	0.540	0.28	0.854	0.3	42.2
1326.1	1326	755.35	1327	747.52	277.60	2.80%	8	0.012	0.000	0.440	0.67	1.421	0.0	100.0
1327.1	1327	747.52	1316	738.58	323.10	2.80%	8	0.012	0.002	0.580	0.01	1.407	0.1	1.9
1328.1	1328	748.50	1329	745.00	420.20	0.80%	8	0.012	0.003	0.570	0.01	0.772	0.3	1.6
1329.1	1329	745.00	1979	743.30	320.10	0.50%	8	0.012	0.011	0.880	0.06	0.617	1.7	9.0
1330.1	1330	757.10	1329	745.00	199.40	6.10%	8	0.012	0.004	0.590	0.01	2.084	0.2	1.8
1331.1	1331	706.40	2019	705.40	17.40	5.80%	8	0.011	0.034	1.130	0.07	2.216	1.5	11.1
1332.1	1332	707.50	1331	706.40	66.80	1.60%	8	0.011	0.034	1.250	0.10	1.184	2.9	14.7
1333.1	1333	714.00	2023	712.65	132.80	1.00%	8	0.011	0.034	1.310	0.11	0.931	3.6	16.5
1334.1	1334	715.81	1333	714.00	334.90	0.50%	8	0.011	0.022	1.090	0.10	0.679	3.2	14.4
1335.1	1335	717.14	1334	715.81	242.10	0.50%	8	0.011	0.016	1.000	0.08	0.684	2.3	12.2
1336.1	1336	726.74	1345	725.14	296.70	0.50%	12	0.011	0.016	0.950	0.22	1.998	0.8	22.5
1337.1	1337	710.92	1277	706.71	218.00	1.90%	12	0.011	0.034	1.190	0.09	3.782	0.9	8.5
1338.1	1338	712.72	1337	710.92	342.00	0.50%	12	0.011	0.034	1.050	0.11	1.974	1.7	11.5
1339.1	1339	714.17	1338	712.72	275.20	0.50%	12	0.011	0.034	1.050	0.26	1.975	1.7	26.0
1340.1	1340	715.57	1339	714.17	254.00	0.60%	12	0.011	0.034	1.070	0.25	2.020	1.7	25.3
1341.1	1341	716.89	1340	715.57	249.60	0.50%	12	0.011	0.034	1.050	0.25	1.979	1.7	24.7
1342.1	1342	718.29	1341	716.89	264.70	0.50%	12	0.011	0.034	1.050	0.25	1.979	1.7	25.5
1343.1	1343	719.27	1342	718.29	177.00	0.60%	12	0.011	0.023	0.950	0.09	2.025	1.1	9.3
1344.1	1344	720.04	1343	719.27	128.80	0.60%	12	0.011	0.023	0.950	0.09	2.104	1.1	9.4
1345.1	1345	725.14	1344	720.04	304.40	1.70%	12	0.011	0.016	0.900	0.06	3.522	0.4	5.5
1346.1	1346	791.98	1347	790.69	215.40	0.60%	8	0.011	0.001	0.520	0.00	0.714	0.1	0.5
1347.1	1347	790.69	1348	789.51	217.20	0.50%	8	0.011	0.003	0.620	0.02	0.680	0.4	3.0
1348.1	1348	789.51	1349	788.81	143.40	0.50%	8	0.011	0.003	0.620	0.02	0.645	0.5	2.9
1349.1	1349	788.81	1350	781.17	235.80	3.20%	8	0.011	0.004	0.600	0.01	1.661	0.3	1.9
1350.1	1350	781.17	1351	775.86	235.90	2.30%	8	0.011	0.007	0.720	0.03	1.385	0.5	5.0
1351.1	1351	775.86	1371	773.23	181.50	1.40%	8	0.011	0.012	0.760	0.03	1.111	1.1	5.1
1352.1	1352	778.64	1351	775.86	52.00	5.40%	8	0.011	0.002	0.550	0.01	2.135	0.1	1.0
1353.1	1353	780.07	1352	778.64	262.00	0.50%	8	0.011	0.002	0.570	0.15	0.682	0.3	23.2
1354.1	1354	785.62	1353	780.07	172.50	3.20%	8	0.011	0.001	0.530	0.00	1.656	0.1	0.7
1355.1	1355	791.04	1354	785.62	179.00	3.00%	8	0.011	0.000	0.330	0.00	1.606	0.0	0.4
1356.1	1356	796.15	1357	789.33	260.30	2.60%	8	0.011	0.001	0.530	0.67	1.494	0.1	100.0
1357.1	1357	789.33	1358	786.52	205.00	1.40%	8	0.011	0.005	0.600	0.01	1.081	0.4	1.9
1358.1	1358	786.52	1359	781.88	252.80	1.80%	8	0.011	0.005	0.620	0.48	1.250	0.4	72.1
1359.1	1359	781.88	1360	776.24	237.40	2.40%	8	0.011	0.008	0.740	0.04	1.423	0.5	5.4
1360.1	1360	776.24	1361	766.46	266.40	3.70%	8	0.011	0.011	0.760	0.67	1.768	0.6	100.0
1361.1	1361	766.46	1369	763.33	297.50	1.10%	8	0.011	0.027	1.190	0.41	0.947	2.9	61.3

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1362.1	1362	768.00	1361	766.46	308.00	0.50%	8	0.011	0.011	0.880	0.06	0.653	1.7	8.8
1363.1	1363	780.08	1364	778.47	99.30	1.60%	8	0.011	0.001	0.530	0.00	1.175	0.1	0.7
1364.1	1364	778.47	1366	774.42	170.60	2.40%	8	0.011	0.004	0.600	0.01	1.422	0.3	2.0
1365.1	1365	784.75	1364	778.47	227.70	2.80%	8	0.011	0.000	0.330	0.00	1.533	0.0	0.4
1366.1	1366	774.42	1367	773.49	166.50	0.60%	8	0.011	0.005	0.660	0.03	0.690	0.7	3.8
1367.1	1367	773.49	1411	769.02	181.40	2.50%	8	0.011	0.007	0.730	0.03	1.449	0.5	5.2
1368.1	1368	765.00	1413	763.75	233.00	0.50%	8	0.011	0.000	0.000	0.00	0.676	0.0	0.0
1369.1	1369	763.33	1407	761.71	304.10	0.50%	8	0.011	0.052	1.380	0.15	0.674	7.8	22.4
1370.1	1370	772.23	1369	763.33	266.20	3.30%	8	0.011	0.019	0.900	0.67	1.688	1.1	100.0
1371.1	1371	773.23	1370	772.23	179.10	0.60%	8	0.011	0.017	1.050	0.08	0.690	2.5	12.4
1372.1	1372	782.36	1371	773.23	244.30	3.70%	8	0.011	0.004	0.600	0.01	1.785	0.2	2.1
1373.1	1373	788.70	1374	785.30	143.00	2.40%	8	0.011	0.000	0.330	0.00	1.423	0.0	0.4
1374.1	1374	785.30	1376	783.75	290.70	0.50%	8	0.011	0.001	0.530	0.16	0.674	0.2	23.9
1375.1	1375	786.87	1382	776.68	252.60	4.00%	8	0.011	0.000	0.000	0.67	1.854	0.0	100.0
1376.1	1376	783.75	1372	782.36	257.50	0.50%	8	0.011	0.004	0.610	0.16	0.678	0.5	23.4
1377.1	1377	785.38	1378	774.92	121.20	8.60%	8	0.011	0.002	0.550	0.01	2.711	0.1	0.9
1378.1	1378	774.92	1392	767.35	272.70	2.80%	8	0.011	0.005	0.640	0.67	1.538	0.3	100.0
1379.1	1379	775.49	1378	774.92	94.70	0.60%	8	0.011	0.002	0.570	0.01	0.716	0.3	1.7
1380.1	1380	778.15	1379	775.49	154.30	1.70%	8	0.011	0.001	0.530	0.00	1.212	0.1	0.7
1381.1	1381	778.93	1380	778.15	159.40	0.50%	8	0.011	0.000	0.330	0.00	0.646	0.0	0.4
1382.1	1382	776.68	1383	774.41	250.70	0.90%	8	0.011	0.001	0.530	0.23	0.878	0.1	34.7
1383.1	1383	774.41	1384	770.78	254.10	1.40%	8	0.011	0.004	0.560	0.37	1.103	0.4	55.4
1384.1	1384	770.78	1385	768.63	155.50	1.40%	8	0.011	0.007	0.650	0.02	1.085	0.6	2.9
1385.1	1385	768.63	1386	765.76	199.30	1.40%	8	0.011	0.008	0.680	0.02	1.108	0.7	3.4
1386.1	1386	765.76	1387	764.10	113.80	1.50%	8	0.011	0.010	0.720	0.03	1.115	0.9	4.3
1387.1	1387	764.10	1390	761.59	181.30	1.40%	8	0.011	0.015	0.840	0.04	1.086	1.4	6.6
1388.1	1388	768.89	1387	764.10	248.70	1.90%	8	0.011	0.003	0.590	0.49	1.281	0.2	73.9
1389.1	1389	759.19	1391	758.87	44.60	0.70%	8	0.011	0.019	1.030	0.08	0.782	2.4	11.5
1390.1	1390	761.59	1389	759.19	176.80	1.40%	8	0.011	0.016	0.870	0.05	1.075	1.5	7.3
1391.1	1391	758.87	1410	757.81	191.10	0.60%	8	0.011	0.029	0.980	0.12	0.687	4.2	18.7
1392.1	1392	767.35	1391	758.87	221.00	3.80%	8	0.011	0.008	0.670	0.02	1.808	0.4	3.2
1393.1	1393	777.31	1397	767.47	190.20	5.20%	8	0.011	0.001	0.530	0.00	2.099	0.0	0.7
1394.1	1394	769.74	1396	767.29	164.20	1.50%	8	0.011	0.001	0.520	0.00	1.128	0.0	0.5
1395.1	1395	769.59	1396	767.29	137.80	1.70%	8	0.011	0.002	0.620	0.02	1.193	0.2	2.9
1396.1	1396	767.29	1407	761.71	266.20	2.10%	8	0.011	0.005	0.600	0.57	1.336	0.4	85.6
1397.1	1397	767.47	1398	766.44	180.80	0.60%	8	0.011	0.002	0.570	0.01	0.697	0.3	1.6
1398.1	1398	766.44	1399	756.75	148.00	6.50%	8	0.011	0.003	0.570	0.01	2.361	0.1	1.5
1399.1	1399	756.75	1400	755.93	145.30	0.60%	8	0.011	0.034	1.090	0.13	0.693	4.9	19.4
1400.1	1400	755.93	1403	754.12	342.60	0.50%	8	0.011	0.037	1.150	0.13	0.671	5.5	19.9
1401.1	1401	765.45	1402	761.51	160.40	2.50%	8	0.011	0.001	0.530	0.00	1.447	0.1	0.6

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1402.1	1402	761.51	1403	754.12	192.20	3.80%	8	0.011	0.004	0.590	0.01	1.810	0.2	1.9
1403.1	1403	754.12	1405	753.10	187.80	0.50%	8	0.011	0.043	1.240	0.14	0.680	6.3	21.1
1404.1	1404	752.09	1093	748.00	232.60	1.80%	8	0.011	0.118	2.170	0.15	1.224	9.6	22.8
1405.1	1405	753.10	1404	752.09	178.40	0.60%	8	0.011	0.045	1.250	0.14	0.694	6.4	21.5
1406.1	1406	754.26	1404	752.09	243.20	0.90%	8	0.011	0.068	1.750	0.14	0.872	7.8	21.7
1407.1	1407	761.71	1408	760.67	119.10	0.90%	8	0.011	0.061	1.670	0.14	0.863	7.1	21.0
1408.1	1408	760.67	1409	755.44	231.70	2.30%	8	0.011	0.063	1.530	0.11	1.387	4.5	16.5
1409.1	1409	755.44	1406	754.26	215.40	0.50%	8	0.011	0.065	1.510	0.16	0.683	9.5	24.6
1410.1	1410	757.81	1399	756.75	190.30	0.60%	8	0.011	0.029	0.990	0.13	0.689	4.2	18.8
1411.1	1411	769.02	1362	768.00	181.80	0.60%	8	0.011	0.008	0.810	0.05	0.691	1.2	7.4
1412.1	1412	787.70	1374	785.30	152.30	1.60%	8	0.011	0.000	0.000	0.00	1.159	0.0	0.0
1413.1	1413	763.75	1369	763.33	65.40	0.60%	8	0.011	0.002	0.630	0.03	0.740	0.3	4.2
1414.1	1414	667.39	1415	665.64	357.30	0.50%	8	0.011	0.120	1.940	0.34	0.646	18.6	50.6
1415.1	1415	665.64	1416	664.42	371.60	0.30%	10	0.011	0.120	1.650	0.30	0.959	12.5	36.4
1416.1	1416	664.42	1417	661.40	420.60	0.70%	10	0.011	0.125	2.210	0.18	1.418	8.8	21.7
1417.1	1417	661.40	1418	660.15	500.00	0.20%	10	0.011	0.131	1.550	0.24	0.837	15.6	28.8
1418.1	1418	660.15	1419	655.48	282.10	1.70%	10	0.011	0.138	2.340	0.62	2.153	6.4	74.6
1419.1	1419	655.48	1420	652.06	146.20	2.30%	10	0.011	0.143	2.310	0.14	2.559	5.6	16.9
1420.1	1420	652.06	1838	648.77	343.00	1.00%	10	0.011	0.337	3.510	0.26	1.639	20.6	31.7
1421.1	1421	656.57	1841	645.43	310.50	3.60%	8	0.011	0.029	1.100	0.08	1.748	1.7	11.4
1422.1	1422	644.14	LS_RBSS	644.00	4.10	3.40%	12	0.011	0.546	5.870	0.23	4.999	10.9	22.9
1423.1	1423	687.80	378	685.91	466.10	0.40%	8	0.013	0.037	0.900	0.26	0.497	7.4	39.4
1424.1	1424	689.57	1423	687.80	416.20	0.40%	8	0.013	0.000	0.000	0.00	0.509	0.0	0.0
1425.1	1425	693.84	1424	689.57	347.30	1.20%	8	0.013	0.000	0.000	0.00	0.866	0.0	0.0
1426.1	1426	695.49	1425	693.84	230.70	0.70%	8	0.013	0.000	0.000	0.00	0.660	0.0	0.0
1427.1	1427	750.03	1428	745.84	408.80	1.00%	6	0.013	0.001	0.530	0.00	0.367	0.3	0.9
1428.1	1428	745.84	316	742.47	324.10	1.00%	6	0.013	0.003	0.650	0.02	0.370	0.9	4.9
1429.1	1429	752.11	1427	750.03	198.10	1.10%	6	0.013	0.001	0.530	0.00	0.372	0.2	0.8
1430.1	1430	635.30	2274	632.80	402.70	0.60%	18	0.011	1.569	4.540	0.51	6.322	24.8	34.2
1431.1	1431	605.90	1433	599.00	327.30	2.10%	8	0.011	0.019	0.970	0.06	1.340	1.4	9.6
1432.1	1432	619.00	1431	605.90	419.50	3.10%	8	0.011	0.003	0.560	0.01	1.631	0.2	1.2
1433.1	1433	599.00	LS_BCP4	592.92	65.10	9.30%	8	0.011	0.030	1.050	0.06	2.820	1.1	9.4
1434.1	1434	613.40	1433	599.00	358.60	4.00%	8	0.011	0.006	0.640	0.67	1.850	0.3	100.0
1435.1	1435	616.90	1434	613.40	344.70	1.00%	8	0.011	0.004	0.570	0.01	0.930	0.4	1.2
1436.1	1436	619.54	1435	616.90	348.70	0.80%	8	0.011	0.000	0.000	0.19	0.803	0.0	28.3
1437.1	1437	621.39	1438	617.01	228.40	1.90%	8	0.011	0.000	0.000	0.00	1.278	0.0	0.0
1438.1	1438	617.01	1439	615.50	416.10	0.40%	10	0.011	0.003	0.550	0.01	1.008	0.3	0.7
1439.1	1439	615.50	1440	614.05	441.90	0.30%	10	0.011	0.009	0.760	0.04	0.959	1.0	4.6
1440.1	1440	614.05	1441	612.60	455.60	0.30%	10	0.011	0.024	0.930	0.18	0.944	2.5	22.1
1441.1	1441	612.60	1442	611.15	442.50	0.30%	10	0.011	0.043	1.020	0.15	0.958	4.5	17.8

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1442.1	1442	611.15	1443	609.70	454.00	0.30%	10	0.011	0.070	1.280	0.26	0.946	7.4	30.9
1443.1	1443	609.70	1444	607.18	93.20	2.70%	10	0.011	0.093	1.810	0.12	2.751	3.4	14.2
1444.1	1444	607.18	1998	604.58	294.40	0.90%	10	0.011	0.099	2.040	0.42	1.573	6.3	49.8
1445.1	1445	737.00	1446	731.60	484.00	1.10%	8	0.011	0.002	0.540	0.30	0.975	0.2	45.7
1446.1	1446	731.60	1447	727.50	192.80	2.10%	8	0.011	0.006	0.710	0.03	1.346	0.5	4.9
1447.1	1447	727.50	1448	714.20	295.10	4.50%	8	0.011	0.008	0.700	0.67	1.960	0.4	100.0
1448.1	1448	714.20	1449	713.10	136.50	0.80%	8	0.011	0.017	0.960	0.07	0.829	2.1	9.8
1449.1	1449	713.10	1450	711.90	160.80	0.70%	8	0.011	0.017	0.980	0.07	0.797	2.2	10.2
1450.1	1450	711.90	1451	711.00	127.30	0.70%	8	0.011	0.019	1.030	0.08	0.776	2.5	11.5
1451.1	1451	711.00	1452	708.00	392.80	0.80%	8	0.011	0.021	1.060	0.29	0.807	2.6	44.1
1452.1	1452	708.00	1453	706.00	253.30	0.80%	8	0.011	0.024	1.170	0.30	0.820	3.0	44.4
1453.1	1453	706.00	1454	705.13	133.30	0.70%	8	0.011	0.027	1.150	0.11	0.746	3.6	15.9
1454.1	1454	705.13	1455	701.70	455.00	0.80%	8	0.011	0.029	1.160	0.30	0.801	3.6	45.2
1455.1	1455	701.70	1456	700.60	142.90	0.80%	8	0.011	0.036	1.290	0.12	0.810	4.4	18.0
1456.1	1456	700.60	1457	699.90	105.40	0.70%	8	0.011	0.036	1.230	0.13	0.752	4.8	18.8
1457.1	1457	699.90	1458	697.60	299.50	0.80%	8	0.011	0.038	1.310	0.12	0.809	4.7	18.6
1458.1	1458	697.60	1459	695.40	299.50	0.70%	8	0.011	0.041	1.350	0.13	0.791	5.2	19.3
1459.1	1459	695.40	1460	694.20	159.00	0.80%	8	0.011	0.052	1.560	0.14	0.802	6.5	20.5
1460.1	1460	694.20	1461	691.20	132.40	2.30%	8	0.011	0.053	1.430	0.10	1.389	3.8	15.6
1461.1	1461	691.20	1462	688.90	300.70	0.80%	8	0.011	0.059	1.650	0.14	0.807	7.3	21.4
1462.1	1462	688.90	1463	684.90	301.80	1.30%	8	0.011	0.065	1.650	0.13	1.063	6.1	19.5
1463.1	1463	684.90	1464	673.00	316.30	3.80%	8	0.011	0.072	1.580	0.11	1.790	4.0	15.8
1464.1	1464	673.00	1465	672.15	173.10	0.50%	8	0.011	0.087	1.690	0.19	0.647	13.5	27.9
1465.1	1465	672.15	1836	662.52	509.30	1.90%	8	0.011	0.162	2.610	0.17	1.269	12.8	25.7
1466.1	1466	711.20	1467	701.80	253.30	3.70%	8	0.011	0.000	0.000	0.67	1.778	0.0	100.0
1467.1	1467	701.80	1461	691.20	190.60	5.60%	8	0.011	0.003	0.570	0.01	2.177	0.1	1.4
1468.1	1468	708.30	1459	695.40	315.00	4.10%	8	0.011	0.005	0.630	0.02	1.868	0.3	2.7
1469.1	1469	716.20	1468	708.30	293.40	2.70%	8	0.011	0.002	0.580	0.67	1.515	0.2	100.0
1470.1	1470	728.79	1471	706.39	492.90	4.50%	8	0.011	0.000	0.000	0.67	1.968	0.0	100.0
1471.1	1471	706.39	1472	701.78	109.00	4.20%	8	0.011	0.006	0.630	0.02	1.898	0.3	2.7
1472.1	1472	701.78	1473	699.11	89.00	3.00%	8	0.011	0.064	1.510	0.10	1.599	4.0	15.5
1473.1	1473	699.11	1474	696.73	120.00	2.00%	8	0.011	0.064	1.570	0.12	1.300	4.9	17.3
1474.1	1474	696.73	1475	692.61	300.30	1.40%	8	0.011	0.074	1.740	0.14	1.081	6.8	20.3
1475.1	1475	692.61	1476	690.69	303.00	0.60%	8	0.011	0.082	1.810	0.17	0.735	11.2	25.5
1476.1	1476	690.69	1477	684.68	300.00	2.00%	8	0.011	0.092	1.880	0.13	1.306	7.0	20.2
1477.1	1477	684.68	1478	678.51	305.30	2.00%	8	0.011	0.101	1.970	0.14	1.312	7.7	20.8
1478.1	1478	678.51	1479	669.75	301.60	2.90%	8	0.011	0.109	2.000	0.13	1.573	6.9	19.7
1479.1	1479	669.75	1414	667.39	132.70	1.80%	8	0.011	0.120	2.190	0.15	1.231	9.7	22.8
1480.1	1480	712.60	1475	692.61	500.00	4.00%	8	0.011	0.002	0.560	0.01	1.846	0.1	1.2
1481.1	1481	715.26	1448	714.20	145.50	0.70%	8	0.011	0.007	0.760	0.04	0.788	0.8	6.3

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1482.1	1482	718.71	1481	715.26	459.60	0.80%	8	0.011	0.002	0.550	0.20	0.800	0.2	29.8
1483.1	1483	712.64	1474	696.73	500.00	3.20%	8	0.011	0.004	0.610	0.02	1.647	0.2	2.3
1484.1	1484	672.41	1465	672.15	168.60	0.20%	8	0.011	0.075	1.060	0.23	0.362	20.6	35.1
1485.1	1485	680.17	1484	672.41	301.10	2.60%	8	0.011	0.050	1.400	0.10	1.482	3.4	15.3
1486.1	1486	684.24	1485	680.17	301.10	1.40%	8	0.011	0.041	1.370	0.11	1.073	3.8	16.7
1487.1	1487	688.07	1486	684.24	133.90	2.90%	8	0.011	0.030	1.150	0.08	1.561	1.9	12.5
1488.1	1488	691.60	1487	688.07	168.50	2.10%	8	0.011	0.030	1.180	0.09	1.336	2.2	13.4
1489.1	1489	693.20	1488	691.60	34.80	4.60%	8	0.011	0.022	1.000	0.06	1.979	1.1	9.7
1490.1	1490	698.22	1489	693.20	314.60	1.60%	8	0.011	0.019	1.000	0.07	1.166	1.7	10.5
1491.1	1491	705.75	1490	698.22	271.20	2.80%	8	0.011	0.010	0.700	0.67	1.538	0.6	100.0
1492.1	1492	713.01	1491	705.75	259.20	2.80%	8	0.011	0.007	0.690	0.67	1.545	0.5	100.0
1493.1	1493	716.12	1492	713.01	119.40	2.60%	8	0.011	0.006	0.630	0.02	1.489	0.4	2.6
1494.1	1494	717.57	1493	716.12	113.90	1.30%	8	0.011	0.004	0.590	0.01	1.041	0.4	1.7
1495.1	1495	721.26	1494	717.57	166.30	2.20%	8	0.011	0.000	0.000	0.00	1.375	0.0	0.0
1496.1	1496	723.03	1495	721.26	74.90	2.40%	8	0.011	0.000	0.000	0.00	1.419	0.0	0.0
1497.1	1497	718.45	1498	709.01	451.70	2.10%	8	0.011	0.000	0.000	0.52	1.334	0.0	78.7
1498.1	1498	709.01	1499	695.25	328.30	4.20%	8	0.011	0.003	0.580	0.01	1.890	0.2	1.6
1499.1	1499	695.25	1501	686.58	311.50	2.80%	8	0.011	0.006	0.660	0.02	1.540	0.4	3.5
1500.1	1500	695.91	1499	695.25	91.80	0.70%	8	0.011	0.000	0.000	0.00	0.783	0.0	0.0
1501.1	1501	686.58	1502	674.17	323.70	3.80%	8	0.011	0.009	0.730	0.03	1.807	0.5	4.7
1502.1	1502	674.17	1484	672.41	331.30	0.50%	8	0.011	0.014	0.730	0.02	0.673	2.1	3.6
1503.1	1503	725.60	1504	716.27	312.40	3.00%	8	0.011	0.000	0.000	0.00	1.595	0.0	0.0
1504.1	1504	716.27	1505	703.40	294.80	4.40%	8	0.011	0.004	0.600	0.67	1.929	0.2	100.0
1505.1	1505	703.40	1490	698.22	111.50	4.60%	8	0.011	0.004	0.600	0.01	1.989	0.2	2.0
1506.1	1506	716.48	1507	703.54	379.10	3.40%	8	0.011	0.000	0.430	0.67	1.705	0.0	100.0
1507.1	1507	703.54	1488	691.60	376.90	3.20%	8	0.011	0.004	0.590	0.67	1.643	0.3	100.0
1508.1	1508	721.69	1509	720.98	106.20	0.70%	8	0.011	0.000	0.000	0.00	0.755	0.0	0.0
1509.1	1509	720.98	1510	695.00	464.40	5.60%	8	0.011	0.001	0.530	0.67	2.183	0.1	100.0
1510.1	1510	695.00	1486	684.24	379.90	2.80%	8	0.011	0.006	0.630	0.67	1.553	0.4	100.0
1511.1	1511	715.60	1512	691.00	347.20	7.10%	8	0.011	0.000	0.000	0.00	2.457	0.0	0.0
1512.1	1512	691.00	1485	680.17	343.70	3.20%	8	0.011	0.004	0.610	0.02	1.639	0.2	2.3
1513.1	1513	692.32	1484	672.41	362.00	5.50%	8	0.011	0.003	0.580	0.67	2.165	0.2	100.0
1514.1	1514	703.93	1513	692.32	254.70	4.60%	8	0.011	0.000	0.000	0.67	1.971	0.0	100.0
1515.1	1515	695.12	1476	690.69	219.00	2.00%	8	0.011	0.006	0.700	0.03	1.313	0.4	4.6
1516.1	1516	707.01	1515	695.12	500.60	2.40%	8	0.011	0.000	0.000	0.00	1.422	0.0	0.0
1517.1	1517	696.70	1518	690.56	400.50	1.50%	8	0.011	0.000	0.290	0.00	1.143	0.0	0.4
1518.1	1518	690.56	1477	684.68	299.00	2.00%	8	0.011	0.004	0.590	0.01	1.294	0.3	1.7
1519.1	1519	688.89	1520	684.51	339.10	1.30%	8	0.011	0.000	0.000	0.00	1.049	0.0	0.0
1520.1	1520	684.51	1478	678.51	341.00	1.80%	8	0.011	0.004	0.590	0.01	1.224	0.3	1.8
1521.1	1521	673.93	1479	669.75	299.70	1.40%	8	0.011	0.005	0.570	0.01	1.090	0.4	1.0

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1522.1	1522	677.55	1521	673.93	400.00	0.90%	8	0.011	0.000	0.000	0.00	0.878	0.0	0.0
1523.1	1523	705.26	1527	699.54	141.70	4.00%	8	0.011	0.000	0.290	0.00	1.855	0.0	0.4
1524.1	1524	690.38	1462	688.90	58.20	2.50%	8	0.011	0.002	0.540	0.01	1.471	0.1	0.8
1525.1	1525	696.17	1526	693.25	133.60	2.20%	8	0.011	0.000	0.290	0.00	1.365	0.0	0.4
1526.1	1526	693.25	1528	685.45	360.90	2.20%	8	0.011	0.001	0.530	0.56	1.357	0.1	84.3
1527.1	1527	699.54	1524	690.38	206.80	4.40%	8	0.011	0.002	0.540	0.00	1.943	0.1	0.7
1528.1	1528	685.45	1463	684.90	49.40	1.10%	8	0.011	0.001	0.530	0.00	0.974	0.1	0.7
1529.1	1529	689.47	1530	684.41	347.20	1.50%	8	0.011	0.004	0.560	0.01	1.114	0.4	1.0
1530.1	1530	684.41	1531	675.89	141.70	6.00%	8	0.011	0.004	0.590	0.01	2.264	0.2	1.9
1531.1	1531	675.89	1532	675.32	73.40	0.80%	8	0.011	0.004	0.620	0.02	0.813	0.5	2.5
1532.1	1532	675.32	1464	673.00	272.00	0.90%	8	0.011	0.011	0.820	0.28	0.852	1.3	41.8
1533.1	1533	677.50	1534	675.82	279.50	0.60%	8	0.011	0.003	0.600	0.18	0.716	0.4	27.6
1534.1	1534	675.82	1532	675.32	116.80	0.40%	8	0.011	0.007	0.730	0.04	0.604	1.1	5.5
1535.1	1535	679.12	1533	677.50	283.80	0.60%	8	0.011	0.000	0.000	0.16	0.697	0.0	24.3
1536.1	1536	717.15	2203	716.12	259.20	0.40%	8	0.011	0.005	0.710	0.14	0.582	0.8	20.6
1537.1	1537	720.11	1536	717.15	158.10	1.90%	8	0.011	0.003	0.640	0.02	1.263	0.2	3.6
1538.1	1538	712.50	2202	710.71	364.00	0.50%	8	0.011	0.008	0.750	0.17	0.647	1.2	25.0
1539.1	1539	708.62	1540	707.66	175.80	0.50%	8	0.011	0.008	0.750	0.04	0.682	1.1	5.9
1540.1	1540	707.66	1541	703.21	289.40	1.50%	8	0.011	0.023	1.070	0.52	1.145	2.0	78.5
1541.1	1541	703.21	1542	701.47	329.20	0.50%	8	0.011	0.023	1.080	0.10	0.671	3.4	14.7
1542.1	1542	701.47	1543	699.93	243.80	0.60%	8	0.011	0.023	1.120	0.09	0.734	3.1	13.3
1543.1	1543	699.93	2201	697.76	414.30	0.50%	12	0.011	0.023	1.010	0.09	1.969	1.1	8.9
1544.1	1544	693.43	1545	691.75	348.10	0.50%	12	0.011	0.095	1.700	0.29	1.891	5.0	28.8
1545.1	1545	691.75	1564	690.15	254.30	0.60%	12	0.011	0.095	1.870	0.32	2.159	4.4	31.7
1546.1	1546	721.94	1547	716.93	266.90	1.90%	8	0.011	0.002	0.590	0.51	1.265	0.2	77.2
1547.1	1547	716.93	1548	716.26	115.50	0.60%	8	0.011	0.005	0.650	0.02	0.703	0.7	3.3
1548.1	1548	716.26	1551	714.94	243.50	0.50%	8	0.011	0.009	0.820	0.05	0.680	1.3	7.6
1549.1	1549	711.77	1552	710.82	172.20	0.60%	8	0.011	0.032	1.050	0.13	0.686	4.7	19.3
1550.1	1550	712.77	1549	711.77	178.70	0.60%	8	0.011	0.022	1.040	0.10	0.691	3.2	14.9
1551.1	1551	714.94	1550	712.77	414.10	0.50%	8	0.011	0.010	0.830	0.05	0.668	1.5	7.5
1552.1	1552	710.82	1554	709.17	309.00	0.50%	8	0.011	0.036	1.130	0.13	0.674	5.3	19.7
1553.1	1553	707.77	1555	702.32	345.80	1.60%	8	0.011	0.044	1.390	0.11	1.159	3.8	16.4
1554.1	1554	709.17	1553	707.77	259.40	0.50%	8	0.011	0.040	1.220	0.28	0.678	5.9	41.3
1555.1	1555	702.32	1544	693.43	68.00	13.10%	8	0.011	0.051	1.240	0.07	3.338	1.5	10.6
1556.1	1556	712.98	1557	710.85	270.00	0.80%	8	0.011	0.000	0.000	0.21	0.820	0.0	32.0
1557.1	1557	710.85	1558	708.40	314.30	0.80%	8	0.011	0.000	0.000	0.00	0.815	0.0	0.0
1558.1	1558	708.40	1541	703.21	115.80	4.50%	8	0.011	0.000	0.000	0.00	1.954	0.0	0.0
1559.1	1559	678.43	2071	677.90	47.50	1.10%	21	0.011	1.471	5.420	0.40	12.788	11.5	23.1
1560.1	1560	680.92	1559	678.43	147.50	1.70%	12	0.011	0.095	1.850	0.12	3.536	2.7	12.3
1561.1	1561	684.43	1560	680.92	170.40	2.10%	12	0.011	0.095	1.830	0.12	3.905	2.4	11.8

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1562.1	1562	687.10	1561	684.43	256.90	1.00%	12	0.011	0.095	1.930	0.41	2.774	3.4	40.6
1563.1	1563	689.05	1562	687.10	247.10	0.80%	12	0.011	0.095	1.970	0.15	2.417	3.9	14.6
1564.1	1564	690.15	1563	689.05	245.60	0.40%	12	0.011	0.095	1.680	0.17	1.821	5.2	16.9
1565.1	1565	777.12	1566	775.77	311.60	0.40%	8	0.012	0.001	0.530	0.00	0.557	0.2	0.7
1566.1	1566	775.77	1582	770.22	168.40	3.30%	8	0.012	0.006	0.620	0.02	1.536	0.4	2.4
1567.1	1567	777.12	1568	771.69	432.40	1.30%	8	0.012	0.001	0.530	0.00	0.948	0.1	0.7
1568.1	1568	771.69	1582	770.22	403.10	0.40%	8	0.012	0.025	0.820	0.13	0.511	5.0	19.4
1569.1	1569	777.59	1570	776.28	301.60	0.40%	8	0.012	0.001	0.530	0.00	0.558	0.2	0.7
1570.1	1570	776.28	1571	775.76	106.20	0.50%	8	0.012	0.004	0.630	0.02	0.592	0.6	3.1
1571.1	1571	775.76	1572	772.54	28.80	11.20%	8	0.012	0.004	0.580	0.01	2.831	0.1	1.5
1572.1	1572	772.54	1568	771.69	221.30	0.40%	8	0.012	0.021	0.980	0.10	0.524	4.1	15.2
1573.1	1573	786.51	1574	773.78	402.20	3.20%	8	0.012	0.001	0.530	0.00	1.505	0.1	0.7
1574.1	1574	773.78	1572	772.54	336.70	0.40%	8	0.012	0.017	0.780	0.10	0.513	3.4	15.5
1575.1	1575	788.06	1576	782.82	262.10	2.00%	8	0.012	0.001	0.530	0.53	1.196	0.1	79.3
1576.1	1576	782.82	1577	774.37	192.60	4.40%	8	0.012	0.004	0.580	0.01	1.772	0.2	1.7
1577.1	1577	774.37	1574	773.78	142.70	0.40%	8	0.012	0.014	0.960	0.07	0.544	2.5	10.5
1578.1	1578	785.47	1579	776.25	280.30	3.30%	8	0.012	0.002	0.570	0.67	1.535	0.2	100.0
1579.1	1579	776.25	1580	775.51	188.80	0.40%	8	0.012	0.010	0.830	0.05	0.530	1.9	7.4
1580.1	1580	775.51	1577	774.37	307.30	0.40%	8	0.012	0.010	0.850	0.07	0.515	1.9	10.0
1581.1	1581	777.02	1579	776.25	196.70	0.40%	8	0.012	0.006	0.680	0.03	0.529	1.0	4.2
1582.1	1582	770.22	1738	769.67	131.60	0.40%	8	0.012	0.031	0.900	0.14	0.547	5.7	21.0
1583.1	1583	666.00	393	662.46	503.90	0.70%	8	0.012	0.001	0.530	0.00	0.709	0.2	0.7
1584.1	1584	803.68	2326	799.69	197.50	2.00%	8	0.012	0.010	0.790	0.04	1.203	0.8	6.4
1585.1	1585	796.34	1586	768.98	124.30	22.00%	8	0.012	0.016	0.740	0.02	3.969	0.4	3.6
1586.1	1586	768.98	527	764.66	13.60	31.80%	8	0.012	0.017	0.740	0.02	4.774	0.4	3.2
1587.1	1587	729.99	1590	729.55	77.20	0.60%	8	0.012	0.046	1.240	0.15	0.639	7.2	22.1
1588.1	1588	727.30	2117	726.18	261.60	0.40%	12	0.012	0.297	2.320	0.41	1.632	18.2	41.2
1589.1	1589	759.51	528	758.33	317.10	0.40%	8	0.012	0.001	0.520	0.00	0.516	0.1	0.6
1590.1	1590	729.55	549	728.76	180.80	0.40%	10	0.012	0.065	1.310	0.16	1.014	6.4	19.7
1591.1	1591	765.00	1592	757.70	260.90	2.80%	8	0.012	0.001	0.520	0.67	1.415	0.0	100.0
1592.1	1592	757.70	1593	745.25	479.60	2.60%	8	0.012	0.003	0.600	0.67	1.363	0.2	100.0
1593.1	1593	745.25	1594	737.88	500.00	1.50%	8	0.012	0.009	0.700	0.03	1.027	0.9	4.0
1594.1	1594	737.88	1590	729.55	154.90	5.40%	8	0.012	0.016	0.830	0.04	1.962	0.8	6.4
1595.1	1595	755.96	1596	750.87	333.10	1.50%	10	0.012	0.077	1.750	0.13	1.896	4.1	15.7
1596.1	1596	750.87	1597	746.45	357.70	1.20%	10	0.012	0.079	1.790	0.45	1.705	4.6	54.3
1597.1	1597	746.45	1598	744.53	138.40	1.40%	10	0.012	0.080	1.790	0.13	1.807	4.4	16.0
1598.1	1598	744.53	1599	742.12	118.30	2.00%	10	0.012	0.081	1.730	0.12	2.189	3.7	14.6
1599.1	1599	742.12	1600	737.31	235.10	2.00%	10	0.012	0.088	1.800	0.12	2.194	4.0	15.0
1600.1	1600	737.31	1601	736.00	240.60	0.50%	10	0.012	0.090	1.630	0.18	1.132	7.9	21.3
1601.1	1601	736.00	1613	734.57	190.70	0.70%	10	0.012	0.106	1.970	0.17	1.328	7.9	20.9

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1602.1	1602	747.43	1603	745.01	289.20	0.80%	8	0.012	0.000	0.500	0.25	0.774	0.0	36.8
1603.1	1603	745.01	1599	742.12	361.20	0.80%	8	0.012	0.003	0.590	0.22	0.757	0.4	32.9
1604.1	1604	746.67	1606	740.79	222.00	2.60%	8	0.012	0.000	0.330	0.00	1.377	0.0	0.4
1605.1	1605	741.12	1606	740.79	69.10	0.50%	8	0.012	0.000	0.330	0.00	0.585	0.0	0.4
1606.1	1606	740.79	1607	739.77	282.70	0.40%	8	0.012	0.002	0.540	0.11	0.508	0.3	16.0
1607.1	1607	739.77	1608	738.89	234.90	0.40%	8	0.012	0.004	0.610	0.02	0.518	0.8	2.3
1608.1	1608	738.89	1609	738.59	58.60	0.50%	8	0.012	0.007	0.740	0.04	0.605	1.1	5.6
1609.1	1609	738.59	1611	737.84	230.50	0.30%	8	0.012	0.007	0.720	0.03	0.483	1.5	4.9
1610.1	1610	738.82	1611	737.84	176.80	0.60%	8	0.012	0.001	0.520	0.00	0.630	0.1	0.5
1611.1	1611	737.84	1612	737.46	55.60	0.70%	8	0.012	0.010	0.810	0.05	0.699	1.4	7.1
1612.1	1612	737.46	1601	736.00	273.40	0.50%	8	0.012	0.011	0.620	0.15	0.618	1.7	23.2
1613.1	1613	734.57	1614	732.92	156.50	1.10%	10	0.012	0.107	2.130	0.16	1.575	6.8	19.2
1614.1	1614	732.92	1615	731.78	113.70	1.00%	10	0.012	0.107	2.150	0.16	1.536	7.0	19.6
1615.1	1615	731.78	1588	727.30	501.00	0.90%	10	0.012	0.228	2.800	0.23	1.451	15.7	28.1
1616.1	1616	739.40	1615	731.78	499.90	1.50%	10	0.012	0.119	2.190	0.15	1.894	6.3	18.6
1617.1	1617	748.20	1616	739.40	529.30	1.70%	10	0.012	0.117	2.160	0.15	1.978	5.9	18.1
1618.1	1618	731.58	1588	727.30	255.70	1.70%	10	0.012	0.000	0.450	0.43	1.985	0.0	51.7
1619.1	1619	727.53	2117	726.18	25.90	5.20%	8	0.012	0.031	1.120	0.08	1.930	1.6	11.5
1620.1	1620	728.10	1619	727.53	94.20	0.60%	8	0.012	0.031	1.010	0.13	0.658	4.6	19.2
1621.1	1621	728.29	1620	728.10	18.90	1.00%	8	0.012	0.031	1.230	0.11	0.849	3.6	16.6
1622.1	1622	731.38	1621	728.29	373.50	0.80%	8	0.012	0.025	1.190	0.32	0.770	3.2	47.9
1623.1	1623	732.87	1622	731.38	278.80	0.50%	8	0.012	0.018	0.950	0.24	0.619	3.0	36.3
1624.1	1624	734.33	1623	732.87	271.80	0.50%	8	0.012	0.013	0.950	0.22	0.620	2.1	32.4
1625.1	1625	735.32	1624	734.33	269.70	0.40%	8	0.012	0.009	0.860	0.16	0.513	1.7	23.8
1626.1	1626	735.99	1625	735.32	172.50	0.40%	8	0.012	0.001	0.520	0.00	0.527	0.1	0.5
1627.1	1627	737.14	1625	735.32	521.70	0.30%	8	0.012	0.003	0.650	0.03	0.500	0.6	3.8
1628.1	1628	739.22	1627	737.14	263.40	0.80%	8	0.012	0.000	0.330	0.21	0.752	0.0	31.6
1629.1	1629	735.42	1624	734.33	301.50	0.40%	8	0.012	0.001	0.520	0.00	0.509	0.1	0.5
1630.1	1630	735.44	1623	732.87	308.20	0.80%	8	0.012	0.001	0.520	0.00	0.773	0.1	0.5
1631.1	1631	733.92	1622	731.38	488.60	0.50%	8	0.012	0.000	0.330	0.14	0.610	0.0	21.6
1632.1	1632	732.70	1621	728.29	263.80	1.70%	8	0.012	0.001	0.520	0.44	1.094	0.1	66.7
1633.1	1633	756.40	1595	755.96	168.50	0.30%	10	0.012	0.076	1.180	0.20	0.784	9.7	23.9
1634.1	1634	756.49	1633	756.40	25.20	0.40%	8	0.012	0.009	0.220	0.16	0.505	1.8	23.6
1635.1	1635	760.40	1657	757.10	98.60	3.30%	8	0.012	0.000	0.170	0.00	1.548	0.0	0.3
1636.1	1636	755.00	1638	751.43	56.40	6.30%	8	0.012	0.001	0.520	0.00	2.129	0.0	0.5
1637.1	1637	752.50	1639	751.10	240.90	0.60%	8	0.012	0.001	0.520	0.00	0.645	0.1	0.5
1638.1	1638	751.43	1639	751.10	45.40	0.70%	8	0.012	0.001	0.530	0.00	0.721	0.1	0.7
1639.1	1639	751.10	1042	739.84	423.90	2.70%	8	0.012	0.004	0.610	0.02	1.379	0.3	2.4
1640.1	1640	745.60	1646	732.92	351.40	3.60%	8	0.012	0.003	0.570	0.67	1.607	0.2	100.0
1641.1	1641	749.40	1640	745.60	380.10	1.00%	8	0.012	0.000	0.480	0.27	0.846	0.0	41.2

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1642.1	1642	748.77	1047	743.51	148.30	3.50%	8	0.012	0.000	0.000	0.00	1.594	0.0	0.0
1643.1	1643	730.04	1058	726.23	211.80	1.80%	8	0.012	0.009	0.740	0.03	1.135	0.8	5.1
1644.1	1644	731.25	1643	730.04	292.50	0.40%	8	0.012	0.007	0.790	0.17	0.544	1.2	25.2
1645.1	1645	732.20	1647	731.79	78.60	0.50%	8	0.012	0.006	0.720	0.03	0.611	1.0	5.1
1646.1	1646	732.92	1645	732.20	192.30	0.40%	8	0.012	0.005	0.670	0.03	0.518	1.0	4.0
1647.1	1647	731.79	1644	731.25	112.00	0.50%	8	0.012	0.006	0.720	0.03	0.588	1.1	5.2
1648.1	1648	756.29	1009	738.36	331.70	5.40%	8	0.012	0.006	0.640	0.02	1.967	0.3	2.8
1649.1	1649	733.04	1059	724.55	344.00	2.50%	8	0.012	0.000	0.160	0.00	1.329	0.0	0.3
1650.1	1650	711.15	1004	709.38	359.40	0.50%	8	0.012	0.013	0.740	0.21	0.594	2.1	32.0
1651.1	1651	763.80	1656	758.17	366.10	1.50%	8	0.011	0.000	0.320	0.40	1.145	0.0	60.7
1652.1	1652	772.23	1653	767.28	240.70	2.10%	8	0.011	0.000	0.320	0.00	1.324	0.0	0.4
1653.1	1653	767.28	1654	764.57	104.50	2.60%	8	0.011	0.002	0.540	0.00	1.486	0.1	0.7
1654.1	1654	764.57	1655	763.08	56.80	2.60%	8	0.011	0.002	0.540	0.01	1.495	0.1	0.8
1655.1	1655	763.08	1656	758.17	187.80	2.60%	8	0.011	0.002	0.540	0.01	1.492	0.1	0.8
1656.1	1656	758.17	1648	756.29	113.20	1.70%	8	0.012	0.004	0.590	0.01	1.090	0.4	1.8
1657.1	1657	757.10	1634	756.49	65.60	0.90%	8	0.012	0.009	0.750	0.04	0.816	1.1	5.4
1658.1	1658	758.27	1657	757.10	123.50	0.90%	8	0.011	0.008	0.710	0.03	0.899	0.9	4.3
1659.1	1659	760.49	1658	758.27	87.50	2.50%	8	0.011	0.005	0.630	0.02	1.470	0.4	2.6
1660.1	1660	761.55	1659	760.49	131.20	0.80%	8	0.011	0.005	0.630	0.02	0.830	0.6	2.8
1661.1	1661	766.30	1660	761.55	189.80	2.50%	8	0.011	0.000	0.500	0.00	1.460	0.0	0.5
1662.1	1662	767.43	1663	764.59	147.20	1.90%	8	0.011	0.000	0.500	0.00	1.282	0.0	0.5
1663.1	1663	764.59	1660	761.55	146.40	2.10%	8	0.011	0.003	0.590	0.01	1.330	0.2	2.0
1664.1	1664	767.85	1663	764.59	158.10	2.10%	8	0.011	0.001	0.530	0.00	1.326	0.1	0.6
1665.1	1665	759.84	1666	758.88	215.80	0.40%	8	0.011	0.000	0.500	0.00	0.616	0.1	0.5
1666.1	1666	758.88	1658	758.27	154.50	0.40%	8	0.011	0.002	0.540	0.00	0.580	0.3	0.7
1667.1	1667	795.34	1668	788.40	132.00	5.30%	8	0.012	0.000	0.000	0.00	1.940	0.0	0.0
1668.1	1668	788.40	1669	785.36	58.20	5.20%	8	0.012	0.001	0.530	0.00	1.934	0.1	0.7
1669.1	1669	785.36	1670	782.04	51.80	6.40%	8	0.012	0.001	0.530	0.00	2.141	0.1	0.7
1670.1	1670	782.04	1680	775.25	154.80	4.40%	8	0.012	0.002	0.550	0.01	1.772	0.1	1.0
1671.1	1671	798.71	1672	785.86	275.20	4.70%	8	0.012	0.001	0.530	0.67	1.828	0.0	100.0
1672.1	1672	785.86	1679	776.85	207.70	4.30%	8	0.012	0.003	0.580	0.01	1.762	0.2	1.6
1673.1	1673	814.15	1983	809.88	138.90	3.10%	8	0.012	0.001	0.520	0.00	1.484	0.0	0.5
1674.1	1674	799.03	1677	790.66	230.70	3.60%	8	0.012	0.005	0.610	0.01	1.611	0.3	2.1
1675.1	1675	791.65	1676	791.14	126.20	0.40%	8	0.012	0.013	0.930	0.07	0.538	2.3	10.0
1676.1	1676	791.14	1677	790.66	70.80	0.70%	8	0.012	0.013	0.900	0.06	0.697	1.9	8.9
1677.1	1677	790.66	1678	783.02	252.10	3.00%	8	0.012	0.018	0.920	0.67	1.473	1.2	100.0
1678.1	1678	783.02	1679	776.85	207.00	3.00%	8	0.012	0.022	1.000	0.07	1.461	1.5	10.1
1679.1	1679	776.85	1680	775.25	296.50	0.50%	8	0.012	0.027	0.920	0.29	0.622	4.4	42.9
1680.1	1680	775.25	1681	773.90	379.20	0.40%	8	0.012	0.033	0.870	0.24	0.505	6.5	36.7
1681.1	1681	773.90	1699	772.59	64.50	2.00%	8	0.012	0.036	1.270	0.10	1.206	3.0	14.8

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1682.1	1682	761.80	1684	750.54	359.10	3.10%	8	0.012	0.009	0.760	0.67	1.498	0.6	100.0
1683.1	1683	764.02	1682	761.80	423.70	0.50%	8	0.012	0.001	0.520	0.00	0.612	0.1	0.5
1684.1	1684	750.54	1695	749.57	278.10	0.30%	8	0.012	0.069	1.260	0.29	0.500	13.7	43.6
1685.1	1685	750.94	1684	750.54	111.60	0.40%	8	0.012	0.059	1.190	0.18	0.506	11.7	27.1
1686.1	1686	770.62	1682	761.80	224.20	3.90%	8	0.012	0.004	0.580	0.01	1.678	0.2	1.6
1687.1	1687	783.57	1688	773.61	179.50	5.50%	8	0.012	0.000	0.160	0.00	1.993	0.0	0.3
1688.1	1688	773.61	1686	770.62	286.90	1.00%	8	0.012	0.004	0.590	0.31	0.864	0.4	46.6
1689.1	1689	774.18	1688	773.61	116.40	0.50%	8	0.012	0.000	0.160	0.00	0.592	0.0	0.3
1690.1	1690	752.13	1685	750.94	255.90	0.50%	8	0.012	0.052	1.210	0.28	0.577	8.9	42.2
1691.1	1691	759.23	1685	750.94	291.80	2.80%	8	0.012	0.004	0.560	0.67	1.426	0.3	100.0
1692.1	1692	765.66	1691	759.23	359.20	1.80%	8	0.012	0.000	0.320	0.46	1.132	0.0	69.3
1693.1	1693	753.55	1690	752.13	378.00	0.40%	8	0.012	0.051	1.130	0.27	0.519	9.9	40.6
1694.1	1694	755.39	1693	753.55	496.90	0.40%	8	0.012	0.051	1.120	0.27	0.515	9.9	40.9
1695.1	1695	749.57	1016	748.65	232.20	0.40%	8	0.012	0.071	1.370	0.19	0.533	13.3	28.0
1696.1	1696	764.27	1698	763.77	164.60	0.30%	10	0.012	0.000	0.150	0.00	0.846	0.0	0.3
1697.1	1697	764.22	1698	763.77	95.50	0.50%	8	0.012	0.000	0.500	0.00	0.581	0.1	0.5
1698.1	1698	763.77	1700	762.94	291.30	0.30%	10	0.012	0.043	0.910	0.24	0.819	5.3	29.3
1699.1	1699	772.59	1698	763.77	320.00	2.80%	8	0.012	0.037	1.260	0.09	1.405	2.6	14.2
1700.1	1700	762.94	1701	762.42	166.70	0.30%	10	0.012	0.048	1.010	0.16	0.857	5.6	19.2
1701.1	1701	762.42	1707	761.90	170.40	0.30%	10	0.012	0.049	1.010	0.16	0.847	5.8	19.6
1702.1	1702	776.80	1708	765.70	366.10	3.00%	8	0.012	0.000	0.500	0.67	1.473	0.0	100.0
1703.1	1703	760.00	2123	756.79	440.70	0.70%	10	0.012	0.064	1.560	0.14	1.309	4.9	17.3
1704.1	1704	771.50	1705	760.49	187.00	5.90%	8	0.012	0.001	0.520	0.00	2.053	0.0	0.6
1705.1	1705	760.49	1703	760.00	196.20	0.20%	10	0.012	0.063	1.070	0.19	0.767	8.3	22.5
1706.1	1706	761.05	1705	760.49	226.90	0.20%	10	0.012	0.058	1.030	0.18	0.762	7.7	21.8
1707.1	1707	761.90	1706	761.05	296.70	0.30%	10	0.012	0.054	1.020	0.26	0.821	6.6	31.0
1708.1	1708	765.70	1707	761.90	148.80	2.60%	8	0.012	0.003	0.580	0.01	1.352	0.2	1.7
1709.1	1709	821.25	1710	819.73	35.10	4.30%	8	0.012	0.000	0.500	0.00	1.760	0.0	0.5
1710.1	1710	819.73	1711	816.07	93.70	3.90%	8	0.012	0.001	0.520	0.00	1.672	0.0	0.6
1711.1	1711	816.07	1712	812.67	123.30	2.80%	8	0.012	0.001	0.530	0.00	1.405	0.1	0.7
1712.1	1712	812.67	1716	803.41	277.60	3.30%	8	0.012	0.003	0.590	0.67	1.545	0.2	100.0
1713.1	1713	814.73	1712	812.67	55.80	3.70%	8	0.012	0.001	0.530	0.00	1.625	0.1	0.6
1714.1	1714	812.48	1715	808.30	136.00	3.10%	8	0.012	0.000	0.330	0.00	1.483	0.0	0.4
1715.1	1715	808.30	1716	803.41	136.90	3.60%	8	0.012	0.001	0.520	0.00	1.599	0.0	0.6
1716.1	1716	803.41	1717	794.83	327.40	2.60%	8	0.012	0.007	0.640	0.02	1.370	0.5	2.7
1717.1	1717	794.83	1721	793.05	175.70	1.00%	8	0.012	0.010	0.760	0.04	0.852	1.2	5.6
1718.1	1718	797.49	1717	794.83	85.30	3.10%	8	0.012	0.000	0.500	0.00	1.494	0.0	0.5
1719.1	1719	792.47	1675	791.65	188.50	0.40%	8	0.012	0.012	0.900	0.06	0.558	2.1	9.1
1720.1	1720	792.78	1719	792.47	62.90	0.50%	8	0.012	0.012	0.910	0.06	0.594	2.0	9.4
1721.1	1721	793.05	1720	792.78	52.30	0.50%	8	0.012	0.011	0.890	0.06	0.608	1.9	9.0

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1722.1	1722	793.58	1721	793.05	75.20	0.70%	8	0.012	0.000	0.500	0.00	0.711	0.1	0.5
1723.1	1723	789.92	1724	786.77	122.40	2.60%	8	0.012	0.000	0.160	0.00	1.357	0.0	0.3
1724.1	1724	786.77	1728	782.22	147.80	3.10%	8	0.012	0.001	0.520	0.00	1.485	0.0	0.6
1725.1	1725	786.81	1724	786.77	72.30	0.10%	8	0.012	0.000	0.160	0.00	0.199	0.1	0.3
1726.1	1726	788.06	1730	776.85	335.20	3.30%	8	0.012	0.000	0.480	0.00	1.547	0.0	0.5
1727.1	1727	789.34	1726	788.06	91.30	1.40%	8	0.012	0.000	0.320	0.00	1.002	0.0	0.4
1728.1	1728	782.22	1729	777.71	160.40	2.80%	8	0.012	0.002	0.540	0.01	1.419	0.1	0.8
1729.1	1729	777.71	1737	773.96	134.30	2.80%	8	0.011	0.003	0.570	0.01	1.542	0.2	1.3
1730.1	1730	776.85	1732	771.82	169.90	3.00%	8	0.011	0.002	0.540	0.01	1.588	0.1	0.8
1731.1	1731	771.20	1733	765.36	189.40	3.10%	8	0.011	0.003	0.580	0.01	1.621	0.2	1.5
1732.1	1732	771.82	1735	770.51	41.00	3.20%	8	0.011	0.003	0.570	0.01	1.650	0.2	1.5
1733.1	1733	765.36	1736	762.09	125.50	2.60%	8	0.012	0.008	0.750	0.04	1.366	0.6	5.5
1734.1	1734	766.38	1733	765.36	29.00	3.50%	8	0.011	0.004	0.600	0.01	1.730	0.3	2.0
1735.1	1735	770.51	1734	766.38	138.60	3.00%	8	0.011	0.003	0.570	0.01	1.593	0.2	1.4
1736.1	1736	762.09	1694	755.39	336.40	2.00%	8	0.012	0.039	1.330	0.10	1.194	3.3	15.7
1737.1	1737	773.96	1731	771.20	96.20	2.90%	8	0.011	0.003	0.570	0.01	1.564	0.2	1.4
1738.1	1738	769.67	1736	762.09	299.00	2.50%	8	0.012	0.031	1.200	0.09	1.347	2.3	13.8
1739.1	1739	784.67	1740	783.72	103.90	0.90%	8	0.011	0.000	0.320	0.00	0.883	0.0	0.4
1740.1	1740	783.72	1741	782.71	113.80	0.90%	8	0.011	0.001	0.520	0.00	0.870	0.1	0.5
1741.1	1741	782.71	1751	769.20	242.80	5.60%	8	0.011	0.001	0.530	0.00	2.177	0.0	0.6
1742.1	1742	790.56	1743	787.62	282.20	1.00%	8	0.011	0.000	0.480	0.30	0.942	0.0	44.6
1743.1	1743	787.62	1746	786.85	166.70	0.50%	8	0.011	0.003	0.610	0.02	0.627	0.4	2.5
1744.1	1744	787.96	1743	787.62	61.90	0.50%	8	0.011	0.000	0.480	0.00	0.684	0.1	0.5
1745.1	1745	788.38	1744	787.96	88.50	0.50%	8	0.011	0.000	0.160	0.00	0.636	0.0	0.3
1746.1	1746	786.85	1747	786.32	111.70	0.50%	8	0.011	0.003	0.610	0.02	0.636	0.4	2.6
1747.1	1747	786.32	1748	778.00	210.10	4.00%	8	0.011	0.007	0.660	0.02	1.837	0.4	3.1
1748.1	1748	778.00	1749	771.22	253.90	2.70%	8	0.011	0.010	0.710	0.67	1.508	0.7	100.0
1749.1	1749	771.22	1750	769.67	361.00	0.40%	8	0.011	0.030	0.940	0.24	0.605	4.9	36.4
1750.1	1750	769.67	1751	769.20	76.00	0.60%	8	0.011	0.031	1.100	0.12	0.726	4.3	18.4
1751.1	1751	769.20	2153	765.73	330.50	1.00%	8	0.011	0.034	1.320	0.11	0.946	3.6	16.7
1752.1	1752	780.76	1753	776.88	210.50	1.80%	8	0.011	0.000	0.160	0.00	1.253	0.0	0.3
1753.1	1753	776.88	1754	770.50	78.50	8.10%	8	0.011	0.001	0.520	0.00	2.631	0.0	0.5
1754.1	1754	770.50	1756	765.86	87.70	5.30%	8	0.011	0.002	0.550	0.01	2.123	0.1	1.1
1755.1	1755	772.92	1754	770.50	178.10	1.40%	8	0.011	0.000	0.480	0.00	1.076	0.0	0.5
1756.1	1756	765.86	1757	765.76	287.70	0.00%	8	0.011	0.002	0.550	0.02	0.172	1.4	2.6
1757.1	1757	765.76	1758	764.46	364.70	0.40%	8	0.011	0.004	0.640	0.11	0.551	0.7	17.2
1758.1	1758	764.46	1759	763.58	236.40	0.40%	8	0.011	0.006	0.700	0.03	0.563	1.1	4.6
1759.1	1759	763.58	2152	761.61	539.00	0.40%	8	0.011	0.008	0.800	0.05	0.558	1.5	7.1
1760.1	1760	764.54	1761	760.09	417.90	1.10%	8	0.011	0.000	0.320	0.00	0.952	0.0	0.4
1761.1	1761	760.09	1763	757.62	297.00	0.80%	10	0.011	0.003	0.600	0.26	1.526	0.2	31.6

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1762.1	1762	762.54	1763	757.62	283.20	1.70%	8	0.011	0.000	0.320	0.49	1.217	0.0	74.2
1763.1	1763	757.62	1764	755.12	300.50	0.80%	10	0.011	0.005	0.670	0.03	1.526	0.3	3.1
1764.1	1764	755.12	1766	753.22	299.20	0.60%	10	0.011	0.008	0.740	0.04	1.334	0.6	4.3
1765.1	1765	761.60	1764	755.12	251.70	2.60%	8	0.011	0.000	0.320	0.65	1.481	0.0	97.6
1766.1	1766	753.22	2150	745.79	519.10	1.40%	10	0.011	0.010	0.780	0.04	2.002	0.5	4.8
1767.1	1767	754.21	1766	753.22	91.50	1.10%	8	0.011	0.001	0.530	0.00	0.960	0.1	0.6
1768.1	1768	754.75	1767	754.21	54.90	1.00%	8	0.011	0.001	0.520	0.00	0.915	0.1	0.6
1769.1	1769	755.39	1768	754.75	67.40	0.90%	8	0.011	0.000	0.480	0.00	0.899	0.0	0.5
1770.1	1770	756.18	1769	755.39	86.60	0.90%	8	0.011	0.000	0.160	0.00	0.882	0.0	0.3
1771.1	1771	771.98	1772	771.70	51.50	0.50%	8	0.011	0.000	0.160	0.00	0.681	0.0	0.3
1772.1	1772	771.70	1773	771.45	47.10	0.50%	8	0.011	0.000	0.480	0.00	0.672	0.1	0.5
1773.1	1773	771.45	2153	765.73	566.00	1.00%	8	0.011	0.001	0.520	0.26	0.928	0.1	39.5
1774.1	1774	762.50	1761	760.09	281.00	0.90%	10	0.011	0.000	0.000	0.24	1.550	0.0	28.9
1775.1	1775	710.44	2336	709.82	103.50	0.60%	8	0.011	0.006	0.690	0.03	0.714	0.8	4.3
1776.1	1776	778.63	2194	777.92	179.30	0.40%	8	0.012	0.004	0.630	0.02	0.532	0.8	2.8
1777.1	1777	779.65	1776	778.63	270.40	0.40%	6	0.012	0.000	0.000	0.10	0.241	0.0	20.4
1778.1	1778	608.20	1779	601.01	231.60	3.10%	8	0.011	0.004	0.580	0.01	1.626	0.2	1.6
1779.1	1779	601.01	1780	599.00	382.30	0.50%	8	0.011	0.007	0.730	0.18	0.669	1.0	26.8
1780.1	1780	599.00	LS_BCP4	592.92	130.90	4.60%	8	0.011	0.007	0.690	0.03	1.989	0.3	4.1
1781.1	1781	697.88	1782	697.08	161.30	0.50%	8	0.011	0.002	0.540	0.01	0.650	0.3	0.8
1782.1	1782	697.08	1783	695.34	269.80	0.60%	8	0.011	0.003	0.600	0.19	0.741	0.4	28.3
1783.1	1783	695.34	1784	694.66	116.50	0.60%	8	0.011	0.003	0.650	0.03	0.705	0.4	5.2
1784.1	1784	694.66	1789	693.98	158.90	0.40%	8	0.011	0.016	1.020	0.08	0.604	2.6	11.8
1785.1	1785	705.48	1786	704.00	405.20	0.40%	8	0.011	0.000	0.000	0.00	0.558	0.0	0.0
1786.1	1786	704.00	1787	702.40	302.80	0.50%	8	0.011	0.002	0.590	0.02	0.671	0.3	2.3
1787.1	1787	702.40	2107	697.19	496.10	1.10%	8	0.011	0.003	0.560	0.30	0.946	0.3	44.4
1788.1	1788	695.37	1784	694.66	100.40	0.70%	8	0.011	0.012	0.830	0.05	0.776	1.5	7.3
1789.1	1789	693.98	1790	691.27	261.00	1.00%	8	0.011	0.016	0.920	0.33	0.940	1.7	49.4
1790.1	1790	691.27	1791	685.53	280.50	2.00%	8	0.011	0.016	0.890	0.63	1.320	1.2	94.2
1791.1	1791	685.53	1794	684.55	188.60	0.50%	8	0.011	0.023	0.970	0.11	0.665	3.5	16.2
1792.1	1792	697.62	1793	694.83	251.70	1.10%	8	0.011	0.003	0.560	0.29	0.972	0.3	42.8
1793.1	1793	694.83	1791	685.53	237.90	3.90%	8	0.011	0.003	0.580	0.01	1.825	0.2	1.6
1794.1	1794	684.55	1795	684.12	82.80	0.50%	8	0.011	0.023	1.030	0.10	0.665	3.5	15.6
1795.1	1795	684.12	1797	683.35	132.00	0.60%	8	0.011	0.024	1.130	0.10	0.705	3.4	15.0
1796.1	1796	682.87	1798	677.56	341.30	1.60%	8	0.011	0.024	1.110	0.08	1.151	2.1	12.6
1797.1	1797	683.35	1796	682.87	75.60	0.60%	8	0.011	0.024	1.160	0.10	0.736	3.3	14.7
1798.1	1798	677.56	1799	669.24	132.00	6.30%	8	0.011	0.032	1.110	0.07	2.317	1.4	10.8
1799.1	1799	669.24	1807	668.84	195.90	0.20%	15	0.011	0.071	1.060	0.17	2.229	3.2	14.0
1800.1	1800	670.50	1799	669.24	403.40	0.30%	12	0.011	0.040	0.940	0.14	1.521	2.6	13.8
1801.1	1801	671.60	1800	670.50	399.70	0.30%	12	0.011	0.040	0.900	0.14	1.428	2.8	14.2

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1802.1	1802	672.70	1801	671.60	312.20	0.40%	12	0.011	0.035	0.910	0.13	1.615	2.2	13.1
1803.1	1803	673.14	1802	672.70	165.60	0.30%	12	0.011	0.035	0.840	0.14	1.403	2.5	13.7
1804.1	1804	674.47	1803	673.14	466.80	0.30%	12	0.011	0.032	0.810	0.21	1.453	2.2	20.7
1805.1	1805	675.01	1804	674.47	157.00	0.30%	12	0.011	0.032	0.870	0.13	1.596	2.0	12.6
1806.1	1806	684.49	1805	675.01	423.90	2.20%	8	0.011	0.011	0.800	0.04	1.380	0.8	6.4
1807.1	1807	668.84	28	667.87	455.70	0.20%	15	0.011	0.071	1.070	0.23	2.276	3.1	18.2
1808.1	1808	706.50	1809	698.37	396.30	2.10%	8	0.011	0.022	1.020	0.65	1.322	1.6	97.8
1809.1	1809	698.37	1810	697.33	187.50	0.60%	8	0.011	0.022	1.020	0.10	0.687	3.1	14.9
1810.1	1810	697.33	1813	692.90	243.90	1.80%	8	0.011	0.022	1.030	0.07	1.244	1.7	10.9
1811.1	1811	684.77	1999	683.87	122.10	0.70%	8	0.011	0.022	1.080	0.08	0.792	2.7	12.6
1812.1	1812	685.40	1811	684.77	119.70	0.50%	8	0.011	0.022	1.030	0.10	0.670	3.2	14.7
1813.1	1813	692.90	1812	685.40	239.80	3.10%	8	0.011	0.022	0.990	0.06	1.632	1.3	9.7
1814.1	1814	708.34	1815	706.51	347.60	0.50%	8	0.011	0.000	0.000	0.13	0.670	0.0	19.6
1815.1	1815	706.51	1786	704.00	457.70	0.50%	8	0.011	0.002	0.540	0.14	0.684	0.2	21.7
1816.1	1816	672.02	1817	671.04	175.20	0.60%	8	0.011	0.000	0.320	0.00	0.690	0.0	0.4
1817.1	1817	671.04	1818	669.62	264.20	0.50%	8	0.011	0.002	0.540	0.15	0.677	0.2	22.1
1818.1	1818	669.62	1819	668.07	290.10	0.50%	8	0.011	0.005	0.650	0.18	0.675	0.7	26.8
1819.1	1819	668.07	1820	666.52	289.00	0.50%	8	0.011	0.006	0.680	0.18	0.676	0.9	27.3
1820.1	1820	666.52	1821	664.97	290.60	0.50%	8	0.011	0.007	0.740	0.19	0.674	1.1	28.7
1821.1	1821	664.97	1823	663.44	287.50	0.50%	8	0.011	0.010	0.620	0.16	0.673	1.4	24.2
1822.1	1822	665.65	1821	664.97	115.50	0.60%	8	0.011	0.000	0.000	0.00	0.708	0.0	0.0
1823.1	1823	663.44	1824	663.44	287.00	0.00%	8	0.011	0.012	0.180	0.22	0.000	Infinity	33.3
1824.1	1824	663.44	1825	660.83	193.30	1.30%	8	0.011	0.014	0.820	0.04	1.072	1.3	6.4
1825.1	1825	660.83	1826	660.45	76.40	0.50%	8	0.011	0.016	1.000	0.08	0.651	2.4	11.3
1826.1	1826	660.45	591	658.24	367.00	0.60%	8	0.011	0.016	0.970	0.23	0.716	2.2	34.2
1827.1	1827	670.28	1828	669.17	202.80	0.50%	8	0.011	0.001	0.530	0.00	0.683	0.2	0.7
1828.1	1828	669.17	1829	668.05	202.10	0.60%	8	0.011	0.003	0.620	0.02	0.687	0.4	3.1
1829.1	1829	668.05	1830	663.86	202.30	2.10%	8	0.011	0.004	0.670	0.03	1.328	0.3	4.1
1830.1	1830	663.86	598	663.04	143.90	0.60%	8	0.011	0.006	0.680	0.03	0.697	0.8	4.1
1831.1	1831	672.77	1832	670.63	406.10	0.50%	8	0.011	0.001	0.530	0.00	0.670	0.2	0.7
1832.1	1832	670.63	1833	669.42	224.00	0.50%	8	0.011	0.004	0.640	0.02	0.678	0.5	3.4
1833.1	1833	669.42	599	668.76	123.40	0.50%	8	0.011	0.005	0.700	0.03	0.675	0.8	4.8
1834.1	1834	674.96	1835	673.26	319.50	0.50%	8	0.011	0.000	0.320	0.00	0.673	0.0	0.4
1835.1	1835	673.26	601	671.23	139.10	1.50%	8	0.011	0.003	0.550	0.01	1.115	0.2	1.0
1836.1	1836	662.52	1837	660.16	181.00	1.30%	10	0.011	0.169	2.690	0.18	1.911	8.9	21.2
1837.1	1837	660.16	1842	654.96	439.40	1.20%	10	0.011	0.169	2.720	0.18	1.820	9.3	21.8
1838.1	1838	648.77	1839	647.53	173.00	0.70%	10	0.011	0.337	3.170	0.28	1.417	23.8	34.2
1839.1	1839	647.53	1840	645.67	342.20	0.50%	10	0.011	0.483	3.180	0.37	1.234	39.2	44.6
1840.1	1840	645.67	1841	645.43	46.70	0.50%	12	0.011	0.483	3.000	0.35	1.951	24.7	35.4
1841.1	1841	645.43	1422	644.14	276.40	0.50%	12	0.011	0.519	3.040	0.50	1.859	27.9	49.8

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1842.1	1842	654.96	1420	652.06	222.00	1.30%	10	0.011	0.172	2.720	0.18	1.913	9.0	21.4
1843.1	1843	711.94	1844	703.89	497.10	1.60%	10	0.011	0.304	3.580	0.59	2.130	14.3	71.0
1844.1	1844	703.89	982	688.02	518.30	3.10%	10	0.011	0.038	0.620	0.19	2.928	1.3	22.8
1845.1	1845	611.16	2195	610.09	107.30	1.00%	8	0.011	0.083	1.910	0.15	0.922	9.0	22.9
1846.1	1846	614.54	1845	611.16	269.80	1.30%	8	0.012	0.083	1.900	0.49	0.947	8.8	73.3
1847.1	1847	615.68	1846	614.54	235.60	0.50%	8	0.012	0.083	1.570	0.19	0.589	14.1	28.4
1848.1	1848	616.57	1847	615.68	135.50	0.70%	8	0.012	0.082	1.720	0.18	0.686	12.0	26.4
1849.1	1849	624.02	1848	616.57	369.20	2.00%	8	0.012	0.082	1.790	0.66	1.202	6.8	99.6
1850.1	1850	626.59	1849	624.02	494.80	0.50%	8	0.012	0.067	1.440	0.32	0.610	11.0	47.3
1851.1	1851	627.24	1850	626.59	110.30	0.60%	8	0.012	0.065	1.490	0.17	0.650	10.0	24.8
1852.1	1852	630.98	1851	627.24	182.20	2.10%	8	0.012	0.064	1.590	0.12	1.212	5.2	17.8
1853.1	1853	636.28	1852	630.98	259.90	2.00%	8	0.012	0.060	1.560	0.65	1.208	4.9	97.4
1854.1	1854	638.98	1853	636.28	259.70	1.00%	8	0.012	0.056	1.610	0.41	0.863	6.5	60.9
1855.1	1855	642.59	1854	638.98	350.20	1.00%	8	0.012	0.017	0.940	0.32	0.859	2.0	48.0
1856.1	1856	644.38	1855	642.59	169.20	1.10%	6	0.012	0.015	0.970	0.07	0.404	3.7	14.2
1857.1	1857	653.48	1856	644.38	497.90	1.80%	6	0.012	0.010	0.820	0.05	0.531	2.0	9.8
1858.1	1858	665.99	1857	653.48	502.10	2.50%	6	0.012	0.006	0.680	0.03	0.620	0.9	5.5
1859.1	1859	676.17	1858	665.99	336.00	3.00%	6	0.012	0.003	0.590	0.01	0.684	0.4	2.8
1860.1	1860	681.49	1859	676.17	170.60	3.10%	6	0.012	0.001	0.530	0.00	0.694	0.2	0.9
1861.1	1861	634.42	1849	624.02	89.20	11.70%	6	0.012	0.010	0.730	0.03	1.342	0.7	6.3
1862.1	1862	644.30	1861	634.42	330.00	3.00%	6	0.012	0.007	0.700	0.03	0.680	1.0	5.8
1863.1	1863	657.14	1862	644.30	364.80	3.50%	6	0.012	0.004	0.600	0.50	0.737	0.6	100.0
1864.1	1864	664.18	1863	657.14	558.30	1.30%	6	0.012	0.000	0.230	0.32	0.441	0.0	64.5
1865.1	1865	648.25	1881	646.99	48.30	2.60%	6	0.012	0.000	0.230	0.00	0.634	0.0	0.5
1866.1	1866	643.19	1853	636.28	375.50	1.80%	6	0.012	0.000	0.450	0.50	0.533	0.1	99.3
1867.1	1867	634.84	1852	630.98	374.30	1.00%	6	0.012	0.000	0.450	0.28	0.399	0.1	55.8
1868.1	1868	649.81	1881	646.99	542.10	0.50%	6	0.012	0.029	0.940	0.14	0.283	10.1	28.9
1869.1	1869	651.05	1868	649.81	229.00	0.50%	6	0.012	0.026	0.950	0.14	0.289	9.1	27.0
1870.1	1870	658.17	1869	651.05	292.00	2.40%	6	0.012	0.022	1.080	0.50	0.613	3.6	100.0
1871.1	1871	665.29	1870	658.17	293.00	2.40%	6	0.012	0.017	0.960	0.50	0.612	2.7	100.0
1872.1	1872	672.40	1871	665.29	292.00	2.40%	6	0.012	0.011	0.830	0.50	0.613	1.8	100.0
1873.1	1873	673.74	1872	672.40	82.30	1.60%	6	0.012	0.007	0.700	0.03	0.501	1.3	6.0
1874.1	1874	676.96	1873	673.74	208.30	1.50%	6	0.012	0.006	0.670	0.02	0.488	1.1	4.9
1875.1	1875	680.67	1874	676.96	449.90	0.80%	6	0.012	0.002	0.540	0.21	0.357	0.5	42.2
1876.1	1876	679.07	1872	672.40	436.70	1.50%	6	0.012	0.002	0.540	0.01	0.486	0.4	1.0
1877.1	1877	671.36	1871	665.29	397.00	1.50%	6	0.012	0.001	0.540	0.44	0.486	0.3	87.7
1878.1	1878	666.15	1870	658.17	358.10	2.20%	6	0.012	0.001	0.530	0.50	0.586	0.2	100.0
1879.1	1879	663.46	1880	660.85	83.70	3.10%	6	0.012	0.000	0.230	0.00	0.694	0.0	0.5
1880.1	1880	660.85	1869	651.05	323.40	3.00%	6	0.012	0.002	0.540	0.00	0.684	0.2	1.0
1881.1	1881	646.99	1854	638.98	329.30	2.40%	6	0.012	0.034	1.280	0.10	0.613	5.5	20.6

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1882.1	1882	660.60	1883	659.58	183.30	0.60%	8	0.011	0.001	0.530	0.00	0.689	0.2	0.7
1883.1	1883	659.58	1898	659.19	60.00	0.60%	8	0.011	0.003	0.580	0.01	0.744	0.3	1.7
1884.1	1884	657.85	1885	656.10	327.50	0.50%	8	0.011	0.009	0.790	0.04	0.675	1.4	6.5
1885.1	1885	656.10	1886	654.21	362.30	0.50%	8	0.011	0.014	0.940	0.20	0.667	2.0	30.2
1886.1	1886	654.21	1896	652.86	249.00	0.50%	8	0.011	0.016	0.990	0.21	0.680	2.4	31.1
1887.1	1887	658.79	1884	657.85	81.40	1.20%	8	0.011	0.000	0.210	0.00	0.992	0.0	0.4
1888.1	1888	667.79	1898	659.19	172.00	5.00%	8	0.011	0.002	0.560	0.01	2.064	0.1	1.3
1889.1	1889	663.56	1884	657.85	255.70	2.20%	8	0.011	0.002	0.540	0.58	1.379	0.1	86.4
1890.1	1890	661.02	1885	656.10	148.10	3.30%	8	0.011	0.002	0.540	0.01	1.682	0.1	0.8
1891.1	1891	653.36	1896	652.86	75.70	0.70%	8	0.011	0.000	0.210	0.00	0.750	0.0	0.4
1892.1	1892	658.58	1897	651.13	75.00	9.90%	8	0.011	0.000	0.210	0.00	2.910	0.0	0.4
1893.1	1893	661.90	1897	651.13	183.20	5.90%	8	0.011	0.000	0.520	0.00	2.238	0.0	0.5
1894.1	1894	649.18	1895	647.35	343.90	0.50%	8	0.011	0.024	1.070	0.10	0.673	3.6	15.7
1895.1	1895	647.35	675	633.86	301.00	4.50%	8	0.011	0.027	1.040	0.07	1.954	1.4	9.9
1896	1896	652.86	1897	651.13	290.90	0.60%	8	0.011	0.019	1.070	0.26	0.712	2.6	38.7
1897.1	1897	651.13	1894	649.18	370.30	0.50%	8	0.011	0.022	1.040	0.24	0.670	3.2	35.6
1898.1	1898	659.19	1884	657.85	244.80	0.50%	8	0.011	0.005	0.670	0.03	0.683	0.8	3.9
1899.1	1899	640.46	677	635.70	186.60	2.60%	8	0.011	0.006	0.650	0.02	1.474	0.4	3.0
1900.1	1900	649.21	1899	640.46	350.90	2.50%	8	0.011	0.003	0.570	0.63	1.457	0.2	95.2
1901.1	1901	652.97	1900	649.21	251.30	1.50%	8	0.011	0.001	0.530	0.38	1.129	0.1	57.1
1902.1	1902	641.58	1903	638.15	227.60	1.50%	8	0.011	0.000	0.320	0.00	1.133	0.0	0.4
1903.1	1903	638.15	1906	633.37	375.10	1.30%	10	0.011	0.010	0.760	0.38	1.889	0.5	45.3
1904.1	1904	638.42	1903	638.15	33.80	0.80%	10	0.011	0.008	0.730	0.03	1.495	0.5	4.1
1905.1	1905	639.17	1904	638.42	130.00	0.60%	10	0.011	0.008	0.770	0.04	1.271	0.6	5.0
1906.1	1906	633.37	1907	628.36	371.30	1.30%	10	0.011	0.013	0.820	0.40	1.944	0.7	48.3
1907.1	1907	628.36	664	622.20	305.50	2.00%	10	0.012	0.017	0.930	0.06	2.178	0.8	7.2
1908.1	1908	701.76	1909	686.41	497.90	3.10%	8	0.011	0.000	0.000	0.00	1.621	0.0	0.0
1909.1	1909	686.41	2436	683.21	223.80	1.40%	8	0.011	0.000	0.000	0.00	1.104	0.0	0.0
1910.1	1910	690.20	1909	686.41	157.60	2.40%	8	0.011	0.000	0.000	0.00	1.431	0.0	0.0
1911.1	1911	689.23	1914	669.06	466.80	4.30%	8	0.011	0.009	0.720	0.67	1.919	0.5	100.0
1912.1	1912	705.39	1911	689.23	459.80	3.50%	8	0.011	0.005	0.620	0.67	1.730	0.3	100.0
1913.1	1913	663.55	94	662.79	235.70	0.30%	8	0.011	0.000	0.000	0.00	0.524	0.0	0.0
1914.1	1914	669.06	1915	665.09	291.60	1.40%	8	0.011	0.014	0.820	0.44	1.077	1.3	65.9
1915.1	1915	665.09	1916	662.06	107.20	2.80%	8	0.011	0.038	1.240	0.09	1.552	2.4	13.3
1916.1	1916	662.06	1917	657.88	83.90	5.00%	8	0.011	0.038	1.190	0.08	2.060	1.8	11.8
1917.1	1917	657.88	1919	656.52	125.80	1.10%	8	0.011	0.047	1.470	0.12	0.960	4.9	18.1
1918.1	1918	672.19	1917	657.88	286.90	5.00%	8	0.011	0.006	0.630	0.67	2.061	0.3	100.0
1919.1	1919	656.52	95	646.34	48.80	20.90%	8	0.011	0.047	1.170	0.06	4.215	1.1	9.1
1920.1	1920	674.51	1915	665.09	270.20	3.50%	8	0.011	0.021	0.930	0.67	1.723	1.2	100.0
1921.1	1921	676.12	1926	675.45	114.40	0.60%	8	0.011	0.005	0.650	0.02	0.706	0.7	3.4

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1922.1	1922	693.26	1923	690.52	170.80	1.60%	8	0.011	0.004	0.640	0.02	1.169	0.3	3.3
1923.1	1923	690.52	1920	674.51	358.70	4.50%	8	0.011	0.012	0.760	0.67	1.950	0.6	100.0
1924.1	1924	691.50	1923	690.52	177.50	0.60%	8	0.011	0.007	0.740	0.04	0.686	1.0	5.6
1925.1	1925	692.35	1924	691.50	150.80	0.60%	8	0.011	0.005	0.670	0.03	0.693	0.7	4.0
1926.1	1926	675.45	1920	674.51	168.50	0.60%	8	0.011	0.005	0.670	0.03	0.690	0.7	3.9
1927.1	1927	650.30	1257	649.42	467.40	0.20%	27	0.011	0.728	2.250	0.46	10.264	7.1	20.5
1928.1	1928	638.15	840	636.26	478.50	0.40%	24	0.011	3.154	4.610	0.85	10.859	29.0	42.3
1929.1	1929	646.07	1928	638.15	547.90	1.40%	24	0.011	3.286	7.430	0.90	20.773	15.8	45.0
1930.1	1930	663.18	1931	658.71	383.40	1.20%	6	0.011	0.000	0.000	0.32	0.463	0.0	63.9
1931.1	1931	658.71	1932	655.07	364.50	1.00%	8	0.011	0.000	0.000	0.26	0.922	0.0	39.0
1932.1	1932	655.07	1933	654.21	152.90	0.60%	12	0.011	0.000	0.000	0.00	2.041	0.0	0.0
1933.1	1933	654.21	1934	652.09	423.00	0.50%	12	0.011	0.000	0.000	0.00	1.926	0.0	0.0
1934.1	1934	652.09	1935	650.74	271.00	0.50%	12	0.011	0.000	0.000	0.13	1.921	0.0	13.5
1935.1	1935	650.74	LS_LHS	649.00	296.80	0.60%	12	0.011	0.066	1.520	0.31	2.084	3.2	31.4
1936.1	1936	722.77	2166	719.74	289.70	1.00%	15	0.011	0.305	3.300	0.52	5.046	6.0	41.6
1937.1	1937	734.54	2165	731.30	298.00	1.10%	15	0.011	0.246	3.120	0.19	5.145	4.8	15.6
1938.1	1938	720.12	2166	719.74	27.80	1.40%	8	0.011	0.000	0.000	0.03	1.079	0.0	4.0
1939.1	1939	721.89	1938	720.12	60.60	2.90%	8	0.011	0.000	0.000	0.00	1.577	0.0	0.0
1940.1	1940	726.41	1941	724.46	109.10	1.80%	6	0.012	0.001	0.520	0.00	0.525	0.1	0.7
1941.1	1941	724.46	1942	721.39	174.80	1.80%	6	0.012	0.001	0.530	0.00	0.521	0.3	1.0
1942.1	1942	721.39	1943	714.46	253.10	2.70%	6	0.012	0.004	0.620	0.50	0.650	0.6	100.0
1943.1	1943	714.46	1944	704.45	198.20	5.10%	6	0.012	0.006	0.630	0.02	0.883	0.7	3.3
1944.1	1944	704.45	1945	702.86	169.70	0.90%	8	0.012	0.059	1.670	0.14	0.819	7.2	21.3
1945.1	1945	702.86	2437	701.89	144.80	0.70%	8	0.012	0.060	1.650	0.14	0.693	8.6	20.6
1946.1	1946	728.46	1947	722.86	218.00	2.60%	8	0.012	0.012	0.830	0.05	1.356	0.9	7.1
1947.1	1947	722.86	1948	717.53	198.10	2.70%	8	0.012	0.014	0.870	0.05	1.388	1.0	7.9
1948.1	1948	717.53	1949	713.74	117.50	3.20%	8	0.012	0.017	0.910	0.06	1.520	1.1	8.4
1949.1	1949	713.74	1950	708.62	123.20	4.20%	8	0.012	0.018	0.920	0.06	1.725	1.0	8.5
1950.1	1950	708.62	1944	704.45	275.90	1.50%	8	0.012	0.049	1.470	0.54	1.040	4.7	80.5
1951.1	1951	709.69	1950	708.62	207.50	0.50%	8	0.012	0.028	0.930	0.13	0.608	4.5	18.8
1952.1	1952	710.66	1951	709.69	172.60	0.60%	8	0.012	0.026	0.930	0.12	0.634	4.2	18.3
1953.1	1953	716.07	1952	710.66	296.10	1.80%	8	0.012	0.011	0.780	0.58	1.144	0.9	87.0
1954.1	1954	721.03	1953	716.07	177.60	2.80%	8	0.012	0.011	0.800	0.04	1.414	0.8	6.5
1955.1	1955	731.50	1956	730.50	182.70	0.50%	8	0.012	0.000	0.000	0.00	0.626	0.0	0.0
1956.1	1956	730.50	1957	728.80	318.10	0.50%	8	0.012	0.003	0.600	0.02	0.619	0.4	2.5
1957.1	1957	728.80	1954	721.03	419.90	1.90%	8	0.012	0.006	0.690	0.03	1.151	0.5	4.2
1958.1	1958	739.35	1956	730.50	291.00	3.00%	8	0.012	0.001	0.520	0.67	1.476	0.0	100.0
1959.1	1959	738.80	1963	729.71	450.40	2.00%	8	0.012	0.004	0.590	0.52	1.202	0.3	77.6
1960.1	1960	740.62	1959	738.80	172.70	1.10%	8	0.012	0.001	0.520	0.00	0.869	0.1	0.5
1961.1	1961	741.99	1959	738.80	123.40	2.60%	8	0.012	0.002	0.560	0.01	1.361	0.2	1.2

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1962.1	1962	739.67	1963	729.71	332.00	3.00%	8	0.012	0.002	0.580	0.01	1.466	0.2	1.8
1963.1	1963	729.71	1946	728.46	42.00	3.00%	8	0.012	0.011	0.800	0.04	1.460	0.8	6.4
1964.1	1964	721.50	1965	720.72	134.80	0.60%	8	0.012	0.001	0.520	0.00	0.644	0.1	0.5
1965.1	1965	720.72	1966	719.93	135.30	0.60%	8	0.012	0.003	0.620	0.02	0.647	0.5	2.9
1966.1	1966	719.93	1967	718.82	201.40	0.60%	8	0.012	0.004	0.630	0.02	0.628	0.7	3.0
1967.1	1967	718.82	1968	713.77	295.40	1.70%	8	0.012	0.005	0.570	0.51	1.106	0.5	76.8
1968.1	1968	713.77	1969	712.00	177.20	1.00%	8	0.012	0.009	0.740	0.03	0.846	1.1	5.1
1969.1	1969	712.00	1952	710.66	123.60	1.10%	8	0.012	0.010	0.760	0.04	0.881	1.1	5.4
1970.1	1970	657.88	2188	657.41	304.50	0.20%	18	0.015	1.349	2.240	0.78	2.312	58.4	52.1
1971.1	1971	696.03	334	695.20	75.00	1.10%	10	0.015	0.075	1.630	0.16	1.291	5.8	18.7
1972.1	1972	743.26	281	742.20	265.10	0.40%	8	0.013	0.025	0.720	0.25	0.494	5.1	37.2
1973.1	1973	758.49	292	757.41	55.30	2.00%	6	0.015	0.002	0.590	0.01	0.439	0.6	2.7
1974.1	1974	744.98	2212	742.10	206.00	1.40%	6	0.015	0.001	0.520	0.00	0.372	0.2	0.7
1975.1	1975	721.50	223	720.15	250.00	0.50%	6	0.015	0.004	0.730	0.17	0.231	1.6	34.9
1976.1	1976	771.00	1977	762.00	491.30	1.80%	8	0.012	0.001	0.520	0.50	1.145	0.0	75.5
1977.1	1977	762.00	1978	756.00	347.10	1.70%	8	0.012	0.006	0.600	0.01	1.112	0.5	1.6
1978.1	1978	756.00	1979	743.30	182.00	7.00%	8	0.012	0.010	0.720	0.03	2.235	0.4	4.3
1979.1	1979	743.30	2082	732.63	483.80	2.20%	8	0.012	0.024	1.110	0.67	1.257	1.9	100.0
1980.1	1980	727.50	2083	721.47	488.70	1.20%	8	0.012	0.038	1.370	0.45	0.940	4.0	67.5
1981.1	1981	735.13	2277	734.85	273.30	0.10%	10	0.013	0.140	1.040	0.37	0.453	30.8	43.9
1982.1	1982	738.59	1981	735.13	470.10	0.70%	10	0.013	0.139	2.090	0.40	1.215	11.5	47.4
1983.1	1983	809.88	1674	799.03	350.30	3.10%	8	0.012	0.001	0.530	0.67	1.489	0.1	100.0
1984.1	1984	631.31	1985	629.65	470.00	0.40%	24	0.011	3.443	4.540	0.89	10.269	33.5	44.6
1985.1	1985	629.65	1986	619.03	668.70	1.60%	24	0.011	3.387	7.770	0.94	21.775	15.6	47.1
1986.1	1986	619.03	1987	616.34	733.70	0.40%	24	0.011	3.342	4.560	0.78	10.462	31.9	39.0
1987.1	1987	616.34	2273	615.13	321.70	0.40%	30	0.011	4.910	5.020	0.87	19.212	25.6	34.7
1988.1	1988	617.90	1987	616.34	594.10	0.30%	18	0.011	1.571	3.310	0.72	4.111	38.2	48.1
1989.1	1989	620.57	1988	617.90	489.00	0.50%	18	0.011	1.571	4.340	0.68	5.929	26.5	45.3
1990.1	1990	637.51	1991	636.10	477.50	0.30%	18	0.011	1.397	3.360	0.67	4.360	32.1	44.5
1991.1	1991	636.10	754	635.46	460.10	0.10%	18	0.011	1.400	2.610	0.75	2.992	46.8	50.0
1992.1	1992	639.45	739	639.16	187.30	0.20%	18	0.011	1.389	2.910	0.65	3.157	44.0	43.6
1993.1	1993	612.10	1994	609.90	663.30	0.30%	30	0.011	4.930	4.810	0.98	18.042	27.3	39.3
1994.1	1994	609.90	1995	609.40	549.00	0.10%	30	0.011	4.940	3.100	1.28	9.455	52.3	51.0
1995.1	1995	609.40	1996	608.91	819.40	0.10%	30	0.011	4.936	3.020	1.28	7.661	64.4	51.3
1996.1	1996	608.91	1997	605.90	553.50	0.50%	30	0.011	4.921	5.770	0.92	23.102	21.3	36.9
1997.1	1997	605.90	1998	604.58	369.40	0.40%	30	0.011	4.914	4.950	0.97	18.727	26.2	38.9
1998.1	1998	604.58	2087	601.12	545.10	0.60%	30	0.011	5.011	6.130	0.76	24.961	20.1	30.5
1999.1	1999	683.87	2000	681.97	354.80	0.50%	8	0.011	0.021	1.040	0.23	0.675	3.2	35.0
2000.1	2000	681.97	2001	679.37	501.20	0.50%	8	0.011	0.021	1.050	0.10	0.665	3.2	14.5
2001.1	2001	679.37	2002	676.92	486.90	0.50%	8	0.011	0.021	1.030	0.23	0.655	3.3	35.1

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2002.1	2002	676.92	1805	675.01	283.80	0.70%	8	0.011	0.021	1.120	0.28	0.757	2.8	42.4
2003.1	2003	752.12	2422	750.65	403.00	0.40%	8	0.011	0.000	0.000	0.00	0.558	0.0	0.0
2004.1	2004	745.38	2421	745.15	244.70	0.10%	8	0.011	0.000	0.000	0.00	0.283	0.0	0.0
2005.1	2005	759.05	2426	754.21	158.80	3.00%	8	0.011	0.000	0.000	0.00	1.611	0.0	0.0
2006.1	2006	755.24	2426	754.21	130.10	0.80%	12	0.011	0.039	1.270	0.11	2.421	1.6	11.1
2007.1	2007	756.84	2006	755.24	282.30	0.60%	12	0.011	0.039	1.190	0.28	2.049	1.9	27.6
2008.1	2008	759.16	2007	756.84	129.80	1.80%	12	0.011	0.000	0.000	0.00	3.638	0.0	0.0
2009.1	2009	774.98	2138	770.56	216.40	2.00%	8	0.011	0.000	0.000	0.00	1.319	0.0	0.0
2010.1	2010	776.89	2122	774.82	393.70	0.50%	8	0.011	0.000	0.000	0.15	0.669	0.0	22.2
2011.1	2011	777.75	2010	776.89	50.50	1.70%	8	0.011	0.000	0.000	0.00	1.204	0.0	0.0
2012.1	2012	783.77	2010	776.89	451.90	1.50%	8	0.011	0.000	0.000	0.38	1.139	0.0	57.3
2013.1	2013	740.75	2014	740.22	130.80	0.40%	12	0.011	0.000	0.000	0.00	1.732	0.0	0.0
2014.1	2014	740.22	2143	738.24	269.80	0.70%	15	0.011	0.207	2.560	0.40	4.227	4.9	31.7
2015.1	2015	656.42	2189	655.46	312.90	0.30%	18	0.013	1.366	3.010	0.63	3.761	36.3	41.9
2016.1	2016	657.07	2015	656.42	189.80	0.30%	8	0.015	0.000	0.000	0.32	0.396	0.0	48.3
2017.1	2017	700.75	2141	700.28	404.90	0.10%	21	0.011	0.198	1.270	0.27	4.123	4.8	15.6
2018.1	2018	707.44	2334	706.83	101.80	0.60%	8	0.011	0.006	0.690	0.03	0.714	0.9	4.3
2019.1	2019	705.40	2020	704.74	163.90	0.40%	8	0.011	0.034	1.000	0.14	0.586	5.8	20.8
2020.1	2020	704.74	1472	701.78	232.50	1.30%	8	0.011	0.056	1.550	0.12	1.041	5.4	18.4
2021.1	2021	706.20	2019	705.40	206.00	0.40%	8	0.011	0.000	0.000	0.00	0.575	0.0	0.0
2022.1	2022	710.90	1332	707.50	100.50	3.40%	8	0.011	0.034	1.180	0.08	1.698	2.0	12.4
2023.1	2023	712.65	2022	710.90	106.20	1.60%	8	0.011	0.034	1.250	0.10	1.185	2.9	14.7
2024.1	2024	713.23	2022	710.90	222.80	1.00%	6	0.011	0.000	0.000	0.00	0.438	0.0	0.0
2025.1	2025	682.06	2026	680.18	234.70	0.80%	12	0.015	0.947	3.510	0.52	1.786	53.0	52.5
2026.1	2026	680.18	33	679.85	16.80	2.00%	12	0.015	0.947	4.900	0.41	2.797	33.9	40.6
2027.1	2027	660.23	2028	660.00	56.70	0.40%	12	0.015	0.393	1.900	0.43	1.271	30.9	42.6
2028.1	2028	659.90	234	658.45	338.50	0.40%	18	0.015	1.346	3.030	0.62	3.851	35.0	41.2
2029.1	2029	660.13	2028	659.90	106.80	0.20%	18	0.015	0.950	2.320	0.58	2.731	34.8	38.7
2030.1	2030	661.49	2029	660.13	628.60	0.20%	12	0.015	0.949	2.110	0.83	0.928	102.2	82.8
2031.1	2031	662.61	2030	661.49	558.40	0.20%	12	0.011	0.948	2.580	0.73	1.219	77.8	73.1
2032.1	2032	734.54	2033	733.68	253.40	0.30%	8	0.011	0.001	0.520	0.09	0.538	0.1	13.5
2033.1	2033	733.68	2034	732.66	270.20	0.40%	8	0.011	0.001	0.520	0.11	0.567	0.1	15.9
2034.1	2034	732.66	2035	731.48	318.30	0.40%	8	0.011	0.001	0.520	0.00	0.562	0.1	0.6
2035.1	2035	731.48	2036	730.03	427.90	0.30%	8	0.011	0.004	0.660	0.03	0.537	0.8	3.9
2036.1	2036	730.03	2037	728.85	318.60	0.40%	8	0.011	0.011	0.920	0.07	0.562	2.0	10.0
2037.1	2037	728.85	2038	728.34	205.90	0.20%	12	0.011	0.011	0.830	0.05	1.354	0.8	4.9
2038.1	2038	728.34	1336	726.74	300.00	0.50%	12	0.011	0.016	0.950	0.07	1.987	0.8	6.5
2039.1	2039	725.75	2040	724.19	429.80	0.40%	8	0.011	0.000	0.000	0.00	0.556	0.0	0.0
2040.1	2040	724.19	2041	723.17	269.80	0.40%	8	0.011	0.000	0.000	0.10	0.568	0.0	15.3
2041.1	2041	723.17	2042	722.25	240.10	0.40%	8	0.011	0.000	0.000	0.00	0.571	0.0	0.0

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2042.1	2042	722.25	2043	721.35	236.50	0.40%	8	0.011	0.000	0.000	0.00	0.569	0.0	0.0
2043.1	2043	721.35	1344	720.04	207.70	0.60%	8	0.011	0.000	0.000	0.00	0.733	0.0	0.0
2044.1	2044	734.31	2033	733.68	186.80	0.30%	8	0.011	0.000	0.000	0.00	0.536	0.0	0.0
2045.1	2045	767.14	2046	765.96	65.40	1.80%	6	0.012	0.005	0.640	0.02	0.528	0.9	4.3
2046.1	2046	765.96	2047	765.21	105.20	0.70%	8	0.012	0.005	0.650	0.02	0.715	0.7	3.4
2047.1	2047	765.21	2048	761.30	132.90	2.90%	8	0.012	0.007	0.720	0.03	1.451	0.5	5.0
2048.1	2048	761.30	1694	755.39	203.50	2.90%	8	0.012	0.009	0.770	0.04	1.442	0.6	6.0
2049.1	2049	650.40	2050	649.74	115.80	0.60%	8	0.011	0.000	0.210	0.00	0.697	0.0	0.4
2050.1	2050	649.74	2051	647.37	455.10	0.50%	10	0.011	0.000	0.480	0.13	1.208	0.0	16.2
2051.1	2051	647.37	2053	641.85	461.70	1.20%	10	0.011	0.003	0.600	0.32	1.830	0.2	38.5
2052.1	2052	644.08	2053	641.85	111.30	2.00%	8	0.011	0.000	0.110	0.00	1.307	0.0	0.3
2053.1	2053	641.85	2054	640.72	92.50	1.20%	10	0.011	0.007	0.690	0.03	1.850	0.4	3.2
2054.1	2054	640.72	1905	639.17	145.10	1.10%	10	0.011	0.008	0.690	0.03	1.730	0.4	3.2
2055.1	2055	628.50	648	627.36	198.70	0.60%	8	0.011	0.018	1.040	0.08	0.699	2.6	12.0
2056.1	2056	638.15	2055	628.50	213.90	4.50%	8	0.011	0.017	0.910	0.06	1.961	0.8	8.5
2057.1	2057	642.30	2056	638.15	449.00	0.90%	8	0.011	0.009	0.730	0.26	0.887	1.0	39.5
2058.1	2058	644.86	2057	642.30	313.60	0.80%	8	0.011	0.004	0.600	0.01	0.834	0.4	2.1
2059.1	2059	654.37	2058	644.86	339.60	2.80%	8	0.011	0.000	0.420	0.00	1.545	0.0	0.5
2060.1	2060	721.26	331	710.76	319.90	3.30%	6	0.015	0.240	3.550	0.24	0.569	42.2	47.6
2061.1	2061	714.40	767	713.64	194.30	0.40%	8	0.011	0.000	0.000	0.00	0.577	0.0	0.0
2062.1	2062	752.00	1617	748.20	357.30	1.10%	10	0.012	0.114	2.200	0.44	1.582	7.2	52.3
2063.1	2063	714.67	1143	713.50	252.90	0.50%	12	0.012	0.655	3.050	0.56	1.697	38.6	55.6
2064.1	2064	698.82	2065	696.94	298.30	0.60%	12	0.011	0.770	3.820	0.42	2.160	35.7	41.9
2065.1	2065	696.94	2066	695.16	285.90	0.60%	12	0.011	0.773	3.800	0.60	2.147	36.0	59.9
2066.1	2066	695.16	1021	694.63	45.30	1.20%	12	0.011	0.774	4.780	0.36	2.943	26.3	35.5
2067.1	2067	691.92	2069	690.90	453.50	0.20%	21	0.011	1.352	2.980	0.64	5.740	23.6	36.5
2068.1	2068	692.10	2067	691.92	87.60	0.20%	21	0.011	1.343	3.130	0.56	5.486	24.5	32.0
2069.1	2069	690.90	2070	685.20	491.70	1.20%	21	0.011	1.364	5.370	0.70	13.030	10.5	40.1
2070.1	2070	685.20	2081	681.40	502.00	0.80%	21	0.011	1.375	4.630	0.43	10.530	13.1	24.6
2071.1	2071	677.90	2072	676.90	160.00	0.60%	21	0.011	1.473	4.410	0.47	9.568	15.4	26.7
2072.1	2072	676.90	2073	674.98	224.40	0.90%	21	0.011	1.477	4.710	0.45	11.194	13.2	25.5
2073.1	2073	674.98	2074	674.68	216.10	0.10%	21	0.011	1.483	2.730	0.67	4.509	32.9	38.0
2074.1	2074	674.68	2075	674.17	437.00	0.10%	21	0.011	1.493	2.540	0.71	4.134	36.1	40.4
2075.1	2075	674.17	2076	672.85	156.90	0.80%	21	0.011	1.498	4.930	0.44	11.100	13.5	25.0
2076.1	2076	672.85	2077	669.49	503.40	0.70%	21	0.011	1.503	4.540	0.46	9.888	15.2	26.6
2077.1	2077	669.49	938	668.45	385.10	0.30%	21	0.011	1.510	3.290	0.66	6.290	24.0	37.8
2078.1	2078	666.37	2079	665.73	350.70	0.20%	21	0.011	1.649	2.980	0.72	5.170	31.9	41.2
2079.1	2079	665.73	2080	665.56	45.00	0.40%	21	0.011	1.641	3.690	0.58	7.439	22.1	32.9
2080.1	2080	665.56	433	661.23	188.80	2.30%	21	0.011	1.651	6.560	0.38	18.327	9.0	21.9
2081.1	2081	681.40	1559	678.43	68.30	4.40%	21	0.011	1.379	8.690	0.28	25.242	5.5	15.9

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2082.1	2082	732.63	1980	727.50	283.10	1.80%	8	0.012	0.028	1.190	0.61	1.139	2.4	91.2
2083.1	2083	721.47	1143	713.50	193.90	4.10%	8	0.012	0.038	1.220	0.09	1.715	2.2	12.8
2084.1	2084	731.22	1980	727.50	301.20	1.20%	8	0.012	0.001	0.530	0.00	0.940	0.1	0.7
2085.1	2085	597.00	2090	594.75	517.00	0.40%	30	0.011	5.077	1.600	2.50	20.666	24.6	100.0
2086.1	2086	597.70	2085	597.00	435.70	0.20%	30	0.011	4.999	1.580	2.50	12.557	39.8	100.0
2087.1	2087	601.12	2088	600.68	267.10	0.20%	30	0.011	5.031	3.750	1.14	12.714	39.6	45.7
2088.1	2088	600.68	2196	600.32	300.70	0.10%	30	0.011	5.004	2.530	1.49	10.841	46.2	59.8
2089.1	2089	600.00	2086	597.70	790.30	0.30%	30	0.011	5.024	1.580	2.50	16.900	29.7	100.0
2090.1	2090	594.75	2091	593.90	628.40	0.10%	30	0.011	5.086	1.600	2.50	11.522	44.1	100.0
2091.1	2091	593.90	2092	592.83	590.60	0.20%	30	0.011	5.439	1.710	2.50	13.335	40.8	100.0
2092.1	2092	592.83	2093	591.90	217.00	0.40%	30	0.011	5.464	1.720	2.50	20.512	26.6	100.0
2093.1	2093	591.90	2094	589.53	449.60	0.50%	30	0.011	5.477	1.730	2.50	22.747	24.1	100.0
2094.1	2094	589.53	2095	589.23	378.70	0.10%	30	0.011	5.498	1.730	2.50	8.817	62.4	100.0
2095.1	2095	589.23	2096	588.30	225.10	0.40%	30	0.011	5.520	1.740	2.50	20.137	27.4	100.0
2096.1	2096	588.30	O-3	588.30	359.60	0.00%	30	0.011	5.534	1.740	2.50	0.000	Infinity	100.0
2097.1	2097	614.46	1993	612.10	624.20	0.40%	30	0.011	4.918	5.060	0.86	19.264	25.5	34.6
2098.1	2098	661.00	W-1	658.00	39.80	7.50%	12	0.011	0.051	1.300	0.08	7.474	0.7	8.1
2099.1	2099	661.49	2098	661.00	195.00	0.30%	12	0.011	0.051	1.010	0.16	1.364	3.7	15.6
2101.1	2101	703.55	2102	701.73	183.00	1.00%	8	0.011	0.001	0.530	0.00	0.920	0.1	0.6
2102.1	2102	701.73	2103	699.67	195.50	1.10%	8	0.011	0.002	0.540	0.00	0.948	0.2	0.7
2103.1	2103	699.67	1792	697.62	191.30	1.10%	8	0.011	0.002	0.550	0.01	0.956	0.2	1.0
2104.1	2104	702.92	2105	699.89	292.60	1.00%	8	0.011	0.000	0.000	0.30	0.939	0.0	45.5
2105.1	2105	699.89	2108	698.64	115.40	1.10%	8	0.011	0.000	0.000	0.00	0.961	0.0	0.0
2106.1	2106	708.65	2105	699.89	346.90	2.50%	8	0.011	0.000	0.000	0.00	1.467	0.0	0.0
2107.1	2107	697.19	1788	695.37	175.30	1.00%	8	0.011	0.012	0.790	0.04	0.940	1.2	5.9
2108.1	2108	698.64	2107	697.19	130.90	1.10%	8	0.011	0.009	0.710	0.03	0.971	0.9	4.2
2109.1	2109	707.18	240	704.75	404.20	0.60%	6	0.015	0.000	0.000	0.00	0.244	0.0	0.0
2110.1	2110	739.45	1982	738.59	300.70	0.30%	10	0.013	0.056	0.980	0.18	0.757	7.4	21.9
2111.1	2111	746.57	284	746.03	88.30	0.60%	6	0.015	0.025	0.880	0.14	0.246	10.0	27.1
2112.1	2112	743.88	1972	743.26	155.10	0.40%	8	0.013	0.001	0.520	0.00	0.494	0.1	0.5
2113.1	2113	746.78	288	744.26	146.20	1.70%	8	0.013	0.000	0.400	0.00	1.025	0.0	0.5
2114.1	2114	705.89	195	704.50	134.30	1.00%	12	0.015	0.342	2.840	0.29	2.030	16.9	28.7
2115.1	2115	750.23	2116	748.02	422.90	0.50%	6	0.013	0.000	0.000	0.00	0.262	0.0	0.0
2116.1	2116	748.02	285	747.83	108.20	0.20%	6	0.013	0.000	0.000	0.04	0.152	0.0	8.5
2117.1	2117	726.18	2063	714.67	365.40	3.20%	12	0.012	0.329	2.940	1.00	4.428	7.4	100.0
2118.1	2118	763.62	2119	762.71	109.00	0.80%	8	0.011	0.000	0.000	0.00	0.843	0.0	0.0
2119.1	2119	762.71	2120	762.20	52.70	1.00%	8	0.011	0.000	0.000	0.00	0.908	0.0	0.0
2120.1	2120	762.20	2121	759.60	335.20	0.80%	8	0.011	0.000	0.000	0.00	0.813	0.0	0.0
2121.1	2121	759.60	2008	759.16	20.60	2.10%	8	0.011	0.000	0.000	0.00	1.348	0.0	0.0
2122.1	2122	774.82	2134	766.10	356.20	2.40%	8	0.011	0.000	0.000	0.62	1.444	0.0	93.4

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2123.1	2123	756.79	1633	756.40	195.50	0.20%	10	0.012	0.065	0.990	0.20	0.685	9.4	24.1
2124.1	2124	705.59	346	698.52	663.10	1.10%	8	0.015	0.294	2.800	0.59	0.699	42.0	88.0
2125.1	2125	697.05	344	696.05	359.50	0.30%	10	0.015	0.423	1.880	0.58	0.647	65.4	69.4
2126.1	2126	685.86	458	680.85	222.00	2.30%	8	0.011	0.044	1.330	0.10	1.387	3.2	14.7
2127.1	2127	680.27	2130	676.42	526.90	0.70%	8	0.011	0.044	1.390	0.13	0.789	5.5	19.6
2128.1	2128	670.45	453	666.79	821.80	0.40%	10	0.011	0.059	1.320	0.15	1.117	5.3	18.4
2129.1	2129	672.15	2128	670.45	443.90	0.40%	8	0.011	0.043	1.100	0.15	0.571	7.4	22.7
2130.1	2130	676.42	2435	673.69	366.10	0.70%	8	0.011	0.043	1.410	0.32	0.797	5.4	48.6
2131.1	2131	687.77	2126	685.86	557.00	0.30%	8	0.011	0.009	0.830	0.14	0.541	1.7	20.9
2132.1	2132	740.22	209	738.99	332.70	0.40%	8	0.015	0.002	0.550	0.03	0.412	0.6	4.9
2133.1	2133	764.56	2008	759.16	253.30	2.10%	8	0.011	0.000	0.000	0.54	1.348	0.0	81.0
2134.1	2134	766.10	2133	764.56	253.30	0.60%	8	0.011	0.000	0.000	0.15	0.720	0.0	23.1
2135.1	2135	775.60	2122	774.82	121.60	0.60%	8	0.011	0.000	0.000	0.00	0.739	0.0	0.0
2136.1	2136	766.82	2134	766.10	123.90	0.60%	8	0.011	0.000	0.000	0.00	0.704	0.0	0.0
2137.1	2137	751.35	2423	748.76	334.10	0.80%	8	0.011	0.000	0.000	0.00	0.813	0.0	0.0
2138.1	2138	770.56	2134	766.10	217.90	2.00%	8	0.011	0.000	0.000	0.00	1.321	0.0	0.0
2139.1	2139	699.00	1017	697.90	416.30	0.30%	21	0.011	0.212	1.730	0.23	6.221	3.4	13.3
2140.1	2140	699.04	2139	699.00	492.40	0.00%	21	0.011	0.201	0.780	0.39	1.091	18.4	22.4
2141.1	2141	700.28	2140	699.04	492.70	0.30%	21	0.011	0.194	1.650	0.29	6.071	3.2	16.8
2142.1	2142	736.39	1937	734.54	251.70	0.70%	15	0.011	0.233	2.670	0.39	4.230	5.5	31.5
2143.1	2143	738.24	2142	736.39	248.10	0.70%	15	0.011	0.221	2.640	0.39	4.261	5.2	31.0
2144.1	2144	741.20	2014	740.22	447.30	0.20%	15	0.011	0.181	1.580	0.25	2.310	7.8	20.2
2145.1	2145	742.17	2144	741.20	431.50	0.20%	15	0.011	0.148	1.480	0.23	2.339	6.3	18.3
2146.1	2146	743.25	2145	742.17	490.40	0.20%	15	0.011	0.120	1.360	0.27	2.315	5.2	21.7
2147.1	2147	743.97	2146	743.25	311.20	0.20%	15	0.011	0.107	1.320	0.20	2.373	4.5	15.9
2148.1	2148	745.05	2147	743.97	484.60	0.20%	15	0.011	0.099	1.260	0.25	2.329	4.3	20.4
2149.1	2149	745.49	2148	745.05	179.30	0.20%	15	0.011	0.098	1.300	0.19	2.444	4.0	15.0
2150.1	2150	745.79	2149	745.49	161.00	0.20%	15	0.011	0.097	1.170	0.20	2.130	4.5	16.0
2151.1	2151	755.88	2150	745.79	220.60	4.60%	8	0.011	0.053	1.350	0.09	1.974	2.7	13.2
2152.1	2152	761.61	2151	755.88	285.30	2.00%	8	0.011	0.053	1.460	0.67	1.308	4.0	100.0
2153.1	2153	765.73	2152	761.61	335.00	1.20%	8	0.011	0.039	1.370	0.11	1.024	3.8	16.9
2154.1	2154	771.84	1749	771.22	154.60	0.40%	8	0.011	0.017	1.030	0.08	0.584	2.8	12.3
2155.1	2155	772.33	2154	771.84	54.10	0.90%	8	0.011	0.016	0.930	0.06	0.879	1.9	9.2
2156.1	2156	772.90	2155	772.33	141.80	0.40%	8	0.011	0.016	1.020	0.08	0.585	2.8	12.3
2157.1	2157	697.00	2159	694.53	290.20	0.90%	12	0.011	0.133	2.330	0.42	2.511	5.3	41.7
2158.1	2158	693.28	2068	692.10	126.80	0.90%	21	0.011	1.339	4.910	0.40	11.677	11.5	23.1
2159.1	2159	694.53	2158	693.28	81.50	1.50%	12	0.011	0.134	2.260	0.15	3.370	4.0	14.6
2160.1	2160	699.48	2157	697.00	296.50	0.80%	12	0.011	0.133	2.310	0.42	2.489	5.3	41.8
2161.1	2161	706.12	1150	703.60	295.80	0.90%	8	0.011	0.061	1.680	0.39	0.852	7.2	59.0
2162.1	2162	707.40	2161	706.12	156.10	0.80%	8	0.011	0.060	1.670	0.14	0.836	7.1	21.1

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2163.1	2163	773.86	2156	772.90	109.60	0.90%	8	0.011	0.016	0.930	0.06	0.864	1.9	9.1
2164.1	2164	778.29	2163	773.86	144.70	3.10%	8	0.011	0.016	0.900	0.05	1.615	1.0	8.1
2165.1	2165	731.30	1936	722.77	488.80	1.70%	15	0.011	0.256	3.370	0.65	6.518	3.9	52.1
2166.1	2166	719.74	2167	716.21	318.90	1.10%	15	0.011	0.304	3.350	0.21	5.191	5.9	17.2
2167.1	2167	716.21	2168	711.92	416.30	1.00%	15	0.011	0.294	3.310	0.21	5.009	5.9	16.9
2168.1	2168	711.92	2169	709.54	477.80	0.50%	15	0.011	0.266	2.460	0.38	3.482	7.6	30.0
2169.1	2169	709.54	2170	706.82	360.60	0.80%	15	0.011	0.242	2.760	0.40	4.285	5.7	32.3
2170.1	2170	706.82	2171	703.98	415.50	0.70%	15	0.011	0.212	2.540	0.20	4.079	5.2	16.2
2171.1	2171	703.98	2017	700.75	402.80	0.80%	15	0.011	0.191	2.590	0.19	4.418	4.3	14.9
2172.1	2172	769.00	1289	764.00	274.70	1.80%	8	0.012	0.009	0.740	0.53	1.142	0.8	79.9
2173.1	2173	777.00	1301	776.00	186.20	0.50%	8	0.012	0.000	0.000	0.00	0.620	0.0	0.0
2174.1	2174	728.00	1295	718.18	288.90	3.40%	8	0.012	0.043	1.300	0.67	1.560	2.8	100.0
2175.1	2175	627.83	2177	624.29	131.90	2.70%	8	0.011	0.029	1.120	0.08	1.512	1.9	12.1
2176.1	2176	628.88	2175	627.83	194.40	0.50%	8	0.011	0.002	0.540	0.00	0.678	0.2	0.7
2177.1	2177	624.29	661	617.24	176.00	4.00%	8	0.011	0.029	1.110	0.08	1.847	1.6	11.6
2178.1	2178	636.44	2175	627.83	276.30	3.10%	8	0.011	0.003	0.580	0.67	1.629	0.2	100.0
2179.1	2179	640.22	2178	636.44	305.70	1.20%	8	0.011	0.000	0.320	0.00	1.026	0.0	0.4
2180.1	2180	648.03	2181	626.62	473.80	4.50%	8	0.011	0.000	0.320	0.67	1.962	0.0	100.0
2181.1	2181	626.62	2183	620.30	425.90	1.50%	8	0.011	0.006	0.630	0.02	1.124	0.5	2.5
2182.1	2182	627.50	2181	626.62	156.00	0.60%	8	0.011	0.000	0.320	0.00	0.693	0.0	0.4
2183.1	2183	620.30	660	617.81	449.10	0.60%	8	0.011	0.006	0.700	0.17	0.687	0.9	25.3
2184.1	2184	620.17	655	615.96	408.90	1.00%	15	0.011	0.000	0.000	0.00	5.006	0.0	0.0
2185.1	2185	621.60	647	620.79	181.80	0.40%	8	0.011	0.000	0.420	0.00	0.616	0.1	0.5
2186.1	2186	657.16	235	657.00	52.10	0.30%	18	0.015	1.349	3.100	0.61	3.262	41.4	40.6
2187.1	2187	659.32	237	659.02	101.20	0.30%	8	0.015	0.000	0.000	0.00	0.369	0.0	0.0
2188.1	2188	657.41	2186	657.16	121.40	0.20%	18	0.015	1.349	2.670	0.68	2.670	50.5	45.4
2189.1	2189	655.46	2190	655.15	84.90	0.40%	18	0.015	1.366	3.070	0.62	3.555	38.4	41.3
2190.1	2190	655.15	2191	654.84	91.40	0.30%	18	0.015	1.366	3.010	0.63	3.427	39.8	41.9
2191.1	2191	654.84	1282	653.40	492.00	0.30%	18	0.011	1.366	3.330	0.66	4.340	31.5	44.2
2192.1	2192	652.02	710	651.84	79.20	0.20%	18	0.011	1.372	3.300	0.59	3.825	35.9	39.3
2193.1	2193	641.20	1992	639.45	588.30	0.30%	18	0.011	1.385	3.360	0.66	4.376	31.6	44.3
2194.1	2194	777.92	1581	777.02	236.10	0.40%	8	0.012	0.006	0.670	0.03	0.522	1.1	3.9
2195.1	2195	610.09	2196	600.32	162.20	6.00%	8	0.011	0.084	1.630	0.10	2.265	3.7	14.5
2196.1	2196	600.32	2089	600.00	354.70	0.10%	30	0.011	5.062	2.110	1.79	9.410	53.8	71.5
2198.1	2198	736.11	2199	728.36	291.20	2.70%	6	0.015	0.010	0.830	0.50	0.513	2.0	100.0
2199.1	2199	728.36	248	724.50	141.00	2.70%	6	0.015	0.011	0.800	0.04	0.520	2.1	8.8
2200.1	2200	695.60	1544	693.43	413.00	0.50%	12	0.011	0.045	1.210	0.13	1.973	2.3	12.6
2201.1	2201	697.76	2200	695.60	413.00	0.50%	12	0.011	0.023	1.020	0.09	1.968	1.1	8.8
2202.1	2202	710.71	1539	708.62	368.60	0.60%	8	0.011	0.008	0.750	0.19	0.695	1.1	28.2
2203.1	2203	716.12	1538	712.50	112.80	3.20%	8	0.011	0.005	0.600	0.01	1.653	0.3	2.0

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2204.1	2204	667.73	2205	667.20	5.70	9.20%	15	0.011	0.072	1.410	0.07	14.995	0.5	5.7
2205.1	2205	667.20	27	665.80	498.30	0.30%	24	0.011	0.100	1.290	0.16	9.159	1.1	8.1
2206.1	2206	761.77	293	758.48	637.90	0.50%	6	0.013	0.010	0.880	0.06	0.260	3.7	12.1
2207.1	2207	812.00	2208	808.32	163.10	2.30%	8	0.011	0.003	0.560	0.01	1.386	0.2	1.3
2208.1	2208	808.32	2209	807.50	151.10	0.50%	8	0.011	0.004	0.640	0.02	0.680	0.6	3.4
2209.1	2209	807.50	2210	806.50	116.70	0.90%	8	0.011	0.005	0.640	0.02	0.855	0.6	2.9
2210.1	2210	806.50	1584	803.68	214.80	1.30%	8	0.011	0.005	0.620	0.02	1.058	0.5	2.3
2211.1	2211	743.87	2212	742.10	127.90	1.40%	8	0.013	0.000	0.440	0.00	0.919	0.0	0.5
2212.1	2212	742.10	265	739.11	284.50	1.10%	6	0.015	0.002	0.540	0.30	0.322	0.6	60.9
2213.1	2213	715.14	2214	714.90	89.70	0.30%	8	0.011	0.012	0.880	0.07	0.478	2.6	11.2
2214.1	2214	714.90	2215	695.38	450.60	4.30%	8	0.011	0.012	0.790	0.67	1.921	0.6	100.0
2215.1	2215	695.38	2441	682.31	368.30	3.50%	8	0.011	0.015	0.870	0.67	1.739	0.9	100.0
2216.1	2216	682.41	2441	682.31	102.50	0.10%	8	0.011	0.004	0.640	0.04	0.288	1.3	6.2
2217.1	2217	695.97	2215	695.38	97.90	0.60%	8	0.011	0.003	0.620	0.02	0.717	0.4	2.9
2218.1	2218	676.39	473	675.32	286.70	0.40%	8	0.012	0.019	0.800	0.21	0.517	3.7	32.1
2219.1	2219	676.67	2218	676.39	36.20	0.80%	8	0.011	0.019	1.010	0.07	0.812	2.3	11.0
2220.1	2220	677.47	2219	676.67	158.70	0.50%	8	0.011	0.019	1.070	0.09	0.655	2.9	12.8
2221.1	2221	779.30	2222	774.16	84.40	6.10%	8	0.011	0.000	0.160	0.00	2.278	0.0	0.3
2222.1	2222	774.16	2223	766.59	294.30	2.60%	8	0.011	0.000	0.480	0.67	1.480	0.0	100.0
2223.1	2223	766.59	2224	758.10	172.70	4.90%	8	0.011	0.003	0.580	0.01	2.046	0.2	1.7
2224.1	2224	758.10	2225	757.62	145.30	0.30%	8	0.011	0.004	0.630	0.02	0.531	0.7	2.9
2225.1	2225	757.62	2228	752.20	306.80	1.80%	8	0.011	0.006	0.640	0.02	1.227	0.5	3.0
2226.1	2226	778.00	2233	772.52	140.00	3.90%	8	0.011	0.000	0.160	0.00	1.826	0.0	0.3
2227.1	2227	762.52	2225	757.62	255.80	1.90%	8	0.011	0.000	0.320	0.49	1.278	0.0	73.9
2228.1	2228	752.20	2230	750.26	176.90	1.10%	8	0.011	0.021	0.890	0.11	0.967	2.1	16.0
2229.1	2229	750.26	2231	748.87	257.00	0.50%	8	0.011	0.021	1.110	0.23	0.679	3.1	34.4
2230.1	2230	750.26	2229	750.26	86.80	0.00%	8	0.011	0.021	0.400	0.19	0.000	Infinity	28.1
2231.1	2231	748.87	2232	747.16	66.00	2.60%	8	0.011	0.021	0.980	0.06	1.486	1.4	9.7
2232.1	2232	747.16	2150	745.79	427.90	0.30%	12	0.011	0.021	0.900	0.09	1.540	1.3	9.1
2233.1	2233	772.52	2223	766.59	70.40	8.40%	8	0.011	0.001	0.530	0.00	2.678	0.0	0.7
2235.1	2235	765.98	2236	764.79	123.80	1.00%	8	0.011	0.000	0.480	0.00	0.905	0.0	0.5
2236.1	2236	764.79	2237	754.66	503.80	2.00%	8	0.011	0.002	0.540	0.01	1.309	0.1	0.8
2237.1	2237	754.66	2228	752.20	467.60	0.50%	8	0.011	0.008	0.760	0.18	0.669	1.2	26.4
2238.1	2238	763.01	2228	752.20	289.40	3.70%	8	0.011	0.000	0.160	0.67	1.784	0.0	100.0
2239.1	2239	655.93	2240	642.57	379.10	3.50%	8	0.011	0.000	0.420	0.67	1.733	0.0	100.0
2240.1	2240	642.57	2244	636.28	256.90	2.40%	8	0.011	0.003	0.600	0.64	1.444	0.2	96.5
2241.1	2241	648.08	2242	636.41	371.80	3.10%	8	0.011	0.001	0.530	0.67	1.635	0.1	100.0
2242.1	2242	636.41	105	633.04	328.70	1.00%	8	0.011	0.007	0.670	0.02	0.935	0.7	3.5
2243.1	2243	626.18	101	620.83	411.60	1.30%	8	0.011	0.009	0.690	0.03	1.052	0.8	3.8
2244.1	2244	636.28	2243	626.18	500.00	2.00%	8	0.011	0.005	0.600	0.01	1.312	0.4	2.0

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2245.1	2245	698.00	2247	696.72	245.30	0.50%	8	0.011	0.003	0.620	0.02	0.667	0.4	3.0
2246.1	2246	701.30	2245	698.00	403.80	0.80%	8	0.011	0.001	0.520	0.00	0.834	0.1	0.6
2247.1	2247	696.72	2255	695.45	295.10	0.40%	8	0.011	0.004	0.680	0.16	0.606	0.7	23.5
2248.1	2248	697.40	2247	696.72	150.10	0.50%	8	0.011	0.000	0.000	0.00	0.621	0.0	0.0
2249.1	2249	700.96	2250	698.52	286.80	0.90%	8	0.011	0.001	0.520	0.25	0.851	0.1	37.2
2250.1	2250	698.52	2255	695.45	377.20	0.80%	8	0.011	0.002	0.550	0.23	0.833	0.3	34.0
2251.1	2251	692.72	2256	691.60	341.90	0.30%	10	0.011	0.012	0.870	0.06	0.958	1.2	6.7
2252.1	2252	693.77	2251	692.72	320.20	0.30%	10	0.011	0.000	0.000	0.00	0.958	0.0	0.0
2253.1	2253	690.11	2254	688.56	489.60	0.30%	10	0.011	0.022	0.960	0.18	0.942	2.3	22.0
2254.1	2254	688.56	560	688.08	129.20	0.40%	10	0.011	0.025	1.080	0.10	1.020	2.4	11.7
2255.1	2255	695.45	2251	692.72	261.30	1.00%	8	0.011	0.009	0.720	0.30	0.943	0.9	45.6
2256.1	2256	691.60	2253	690.11	469.90	0.30%	10	0.011	0.020	0.980	0.17	0.942	2.1	20.8
2257.1	2257	690.30	2268	677.00	231.10	5.80%	8	0.011	0.002	0.560	0.01	2.214	0.1	1.2
2258.1	2258	669.27	2265	668.50	134.80	0.60%	8	0.011	0.086	1.780	0.18	0.698	12.3	26.6
2259.1	2259	695.85	2260	678.37	325.60	5.40%	8	0.011	0.002	0.540	0.01	2.138	0.1	0.8
2260.1	2260	678.37	2261	673.96	104.00	4.20%	8	0.011	0.005	0.630	0.02	1.901	0.3	2.6
2261.1	2261	673.96	2262	670.58	105.90	3.20%	8	0.011	0.006	0.620	0.02	1.649	0.3	2.4
2262.1	2262	670.58	2258	669.27	235.80	0.60%	8	0.011	0.076	1.630	0.17	0.688	11.1	26.1
2263.1	2263	673.00	2264	670.40	83.60	3.10%	8	0.011	0.000	0.520	0.00	1.627	0.0	0.5
2264.1	2264	670.40	2262	670.58	286.80	-0.10%	8	0.011	0.069	0.480	0.39	0.231	30.0	58.3
2265.1	2265	668.50	2266	667.55	171.40	0.60%	8	0.011	0.087	1.740	0.18	0.687	12.7	27.3
2266.1	2266	667.55	2267	667.40	8.50	1.80%	8	0.011	0.087	1.850	0.13	1.223	7.1	20.2
2267.1	2267	667.40	2269	664.65	477.90	0.60%	8	0.011	0.088	1.800	0.33	0.700	12.5	49.7
2268.1	2268	677.00	2258	669.27	200.30	3.90%	8	0.011	0.006	0.630	0.02	1.813	0.3	2.6
2269.1	2269	664.65	2270	656.15	494.10	1.70%	8	0.011	0.104	2.030	0.62	1.211	8.5	92.7
2270.1	2270	656.15	2271	649.76	490.20	1.30%	8	0.011	0.121	2.260	0.52	1.054	11.4	78.1
2271.1	2271	649.76	2272	649.24	126.90	0.40%	8	0.011	0.136	1.900	0.24	0.591	23.0	35.3
2272.1	2272	649.24	1839	647.53	443.50	0.40%	8	0.011	0.139	1.880	0.24	0.573	24.2	36.3
2273.1	2273	615.13	2097	614.46	178.10	0.40%	30	0.011	4.913	4.940	0.88	19.217	25.6	35.1
2274.1	2274	632.80	1989	631.59	409.00	0.30%	18	0.011	1.570	3.480	0.63	4.364	36.0	41.7
2275.1	2275	633.79	854	631.31	437.00	0.60%	24	0.011	3.479	5.390	0.71	13.016	26.7	35.5
2276.1	2276	725.78	2443	724.26	301.60	0.50%	6	0.015	0.000	0.000	0.00	0.223	0.0	0.0
2277.1	2277	734.85	161	734.74	6.80	1.60%	10	0.013	0.139	1.470	0.26	1.802	7.7	31.4
2278.1	2278	698.32	2279	696.04	219.70	1.00%	8	0.013	0.000	0.000	0.00	0.796	0.0	0.0
2279.1	2279	696.04	1426	695.49	47.00	1.20%	8	0.013	0.000	0.000	0.00	0.845	0.0	0.0
2280.1	2280	792.22	2281	790.81	262.50	0.50%	8	0.011	0.000	0.500	0.14	0.676	0.1	21.6
2281.1	2281	790.81	2282	771.15	447.80	4.40%	8	0.011	0.003	0.570	0.67	1.934	0.1	100.0
2282.1	2282	771.15	903	770.31	381.90	0.20%	8	0.011	0.013	0.810	0.14	0.433	2.9	21.1
2283.1	2283	771.55	2282	771.15	308.70	0.10%	8	0.011	0.005	0.740	0.04	0.332	1.4	6.1
2284.1	2284	791.60	2289	778.50	303.30	4.30%	8	0.011	0.001	0.520	0.00	1.918	0.0	0.5

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2285.1	2285	770.85	2286	763.90	299.30	2.30%	8	0.011	0.008	0.680	0.02	1.406	0.6	3.5
2286.1	2286	763.90	2287	757.55	284.70	2.20%	8	0.011	0.008	0.690	0.66	1.378	0.6	98.9
2287.1	2287	757.55	2288	757.13	62.50	0.70%	8	0.011	0.008	0.750	0.04	0.757	1.1	5.6
2288.1	2288	757.13	2373	754.67	425.50	0.60%	8	0.011	0.009	0.760	0.04	0.702	1.2	6.0
2289.1	2289	778.50	2283	771.55	129.90	5.30%	8	0.011	0.004	0.590	0.01	2.135	0.2	1.8
2290.1	2290	613.00	2291	610.76	57.30	3.90%	8	0.011	0.004	0.580	0.01	1.824	0.2	1.7
2291.1	2291	610.76	1431	605.90	315.00	1.50%	8	0.011	0.011	0.780	0.04	1.146	0.9	5.9
2292.1	2292	621.00	2291	610.76	413.60	2.50%	8	0.011	0.003	0.570	0.01	1.452	0.2	1.3
2293.1	2293	658.42	2294	656.25	204.10	1.10%	8	0.011	0.002	0.540	0.00	0.952	0.2	0.7
2294.1	2294	656.25	2295	655.13	203.80	0.50%	8	0.011	0.003	0.630	0.02	0.684	0.4	3.2
2295.1	2295	655.13	2296	650.77	326.60	1.30%	8	0.011	0.003	0.560	0.01	1.066	0.3	0.9
2296.1	2296	650.77	2299	648.11	308.60	0.90%	8	0.011	0.006	0.670	0.02	0.857	0.7	3.6
2297.1	2297	651.79	2296	650.77	91.90	1.10%	8	0.011	0.000	0.520	0.00	0.973	0.0	0.5
2298.1	2298	654.28	2297	651.79	96.80	2.60%	8	0.011	0.000	0.320	0.00	1.480	0.0	0.4
2299.1	2299	648.11	2303	642.03	368.70	1.60%	8	0.011	0.009	0.750	0.47	1.185	0.7	70.7
2300.1	2300	654.72	2301	653.84	62.70	1.40%	8	0.011	0.000	0.210	0.00	1.093	0.0	0.4
2301.1	2301	653.84	2302	647.64	452.10	1.40%	8	0.011	0.000	0.420	0.35	1.081	0.0	52.1
2302.1	2302	647.64	2303	642.03	299.40	1.90%	8	0.011	0.002	0.580	0.01	1.264	0.2	1.9
2303.1	2303	642.03	2304	640.87	213.50	0.50%	8	0.011	0.015	0.970	0.07	0.680	2.2	10.6
2304.1	2304	640.87	2305	639.78	197.00	0.60%	8	0.011	0.017	1.040	0.08	0.687	2.4	12.3
2305.1	2305	639.78	2306	638.92	153.60	0.60%	8	0.011	0.018	1.070	0.09	0.691	2.7	12.8
2306.1	2306	638.92	2175	627.83	224.40	4.90%	8	0.011	0.020	0.970	0.06	2.052	1.0	9.4
2307.1	2307	656.54	2308	649.67	141.10	4.90%	8	0.011	0.001	0.530	0.00	2.037	0.1	0.7
2308.1	2308	649.67	2057	642.30	191.20	3.90%	8	0.011	0.003	0.570	0.01	1.812	0.1	1.3
2309.1	2309	650.35	2310	648.44	179.90	1.10%	8	0.011	0.000	0.420	0.00	0.951	0.0	0.5
2310.1	2310	648.44	2056	638.15	321.00	3.20%	8	0.011	0.003	0.590	0.01	1.653	0.2	1.9
2311.1	2311	655.07	2310	648.44	166.10	4.00%	8	0.011	0.002	0.540	0.00	1.844	0.1	0.7
2312.1	2312	616.62	2313	615.37	330.00	0.40%	8	0.011	0.005	0.730	0.04	0.568	0.9	5.7
2313.1	2313	615.37	2314	614.04	349.40	0.40%	8	0.011	0.010	0.850	0.15	0.569	1.7	22.4
2314.1	2314	614.04	2315	612.68	358.50	0.40%	8	0.011	0.015	1.000	0.17	0.569	2.6	26.1
2315.1	2315	612.68	2316	611.57	291.00	0.40%	8	0.011	0.020	0.870	0.22	0.570	3.5	32.5
2316.1	2316	611.57	2317	606.69	353.80	1.40%	10	0.011	0.023	1.090	0.43	1.965	1.2	51.7
2317.1	2317	606.69	2318	605.08	103.80	1.60%	10	0.011	0.027	1.160	0.09	2.084	1.3	10.8
2318.1	2318	605.08	2087	601.12	433.90	0.90%	10	0.011	0.042	1.390	0.11	1.599	2.6	13.6
2319.1	2319	609.08	2320	607.58	399.80	0.40%	8	0.011	0.000	0.520	0.00	0.565	0.1	0.5
2320.1	2320	607.58	2324	606.03	415.30	0.40%	10	0.011	0.003	0.580	0.01	1.022	0.3	1.3
2321.1	2321	606.87	2322	606.83	376.80	0.00%	10	0.011	0.002	0.540	0.01	0.172	0.9	0.9
2322.1	2322	606.83	2323	606.35	189.60	0.30%	10	0.011	0.004	0.590	0.01	0.842	0.5	1.4
2323.1	2323	606.35	2324	606.03	89.80	0.40%	10	0.011	0.004	0.590	0.01	0.999	0.4	1.4
2324.1	2324	606.03	2325	605.81	65.60	0.30%	10	0.011	0.012	0.840	0.05	0.969	1.2	6.1

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2325.1	2325	605.81	2318	605.08	179.50	0.40%	10	0.011	0.012	0.820	0.05	1.067	1.1	5.4
2326.1	2326	799.69	1585	796.34	130.10	2.60%	8	0.012	0.015	0.890	0.05	1.358	1.1	8.1
2327.1	2327	805.25	2330	800.90	187.70	2.30%	8	0.011	0.002	0.540	0.01	1.405	0.1	0.8
2328.1	2328	812.50	2327	805.25	220.10	3.30%	8	0.011	0.001	0.530	0.00	1.675	0.1	0.7
2329.1	2329	812.60	2328	812.50	229.60	0.00%	8	0.011	0.000	0.000	0.00	0.193	0.0	0.0
2330.1	2330	800.90	2326	799.69	86.40	1.40%	8	0.011	0.003	0.550	0.01	1.092	0.2	0.9
2331.1	2331	701.80	2017	700.75	24.40	4.30%	12	0.011	0.021	0.890	0.05	5.648	0.4	4.5
2332.1	2332	705.98	2331	701.80	300.50	1.40%	12	0.011	0.021	1.010	0.07	3.210	0.6	6.9
2333.1	2333	705.98	2332	705.98	127.90	0.00%	12	0.011	0.006	0.120	0.15	0.000	Infinity	15.4
2334.1	2334	706.83	2333	705.98	103.10	0.80%	8	0.011	0.006	0.670	0.02	0.838	0.7	3.5
2335.1	2335	709.61	2018	707.44	413.70	0.50%	8	0.011	0.006	0.720	0.03	0.669	0.9	5.1
2336.1	2336	709.82	2335	709.61	22.20	0.90%	8	0.011	0.006	0.660	0.02	0.899	0.7	3.3
2337.1	2337	711.17	1775	710.44	125.70	0.60%	8	0.011	0.006	0.690	0.03	0.703	0.9	4.3
2338.1	2338	711.70	2337	711.17	86.10	0.60%	8	0.011	0.006	0.690	0.03	0.724	0.8	4.2
2339.1	2339	712.27	2338	711.70	96.50	0.60%	8	0.011	0.006	0.690	0.03	0.709	0.9	4.3
2340.1	2340	713.23	2339	712.27	135.30	0.70%	8	0.011	0.000	0.000	0.00	0.777	0.0	0.0
2341.1	2341	713.46	2340	713.23	26.10	0.90%	8	0.011	0.000	0.000	0.00	0.867	0.0	0.0
2342.1	2342	713.70	2341	713.46	28.40	0.80%	8	0.011	0.000	0.000	0.00	0.848	0.0	0.0
2343.1	2343	718.14	2344	713.03	201.50	2.50%	8	0.011	0.000	0.000	0.00	1.470	0.0	0.0
2344.1	2344	713.03	2339	712.27	27.70	2.70%	8	0.011	0.000	0.000	0.00	1.529	0.0	0.0
2345.1	2345	708.11	2346	707.22	264.40	0.30%	21	0.011	0.002	0.540	0.09	7.021	0.0	5.4
2346.1	2346	707.22	2347	705.65	486.20	0.30%	21	0.011	0.002	0.540	0.09	6.877	0.0	5.3
2347.1	2347	705.65	2348	704.56	326.70	0.30%	21	0.011	0.002	0.600	0.02	6.990	0.0	1.0
2348.1	2348	704.56	2349	703.28	391.40	0.30%	21	0.011	0.002	0.540	0.10	6.921	0.0	5.5
2349.1	2349	703.28	2350	702.39	230.50	0.40%	21	0.011	0.002	0.540	0.01	7.520	0.0	0.3
2350.1	2350	702.39	2351	700.78	185.90	0.90%	21	0.011	0.002	0.540	0.01	11.263	0.0	0.3
2351.1	2351	700.78	2352	699.08	200.10	0.80%	21	0.011	0.002	0.540	0.01	11.154	0.0	0.3
2352.1	2352	699.08	2353	698.34	77.70	1.00%	21	0.011	0.002	0.540	0.01	11.812	0.0	0.3
2353.1	2353	698.34	2354	693.99	531.80	0.80%	21	0.011	0.002	0.540	0.01	10.946	0.0	0.3
2354.1	2354	693.99	2355	689.74	530.70	0.80%	21	0.011	0.002	0.540	0.01	10.830	0.0	0.3
2355.1	2355	689.74	2356	685.29	546.70	0.80%	21	0.011	0.002	0.540	0.01	10.919	0.0	0.3
2356.1	2356	685.29	7	683.56	132.50	1.30%	21	0.011	0.002	0.540	0.01	13.829	0.0	0.3
2357.1	2357	712.81	2358	709.57	172.80	1.90%	8	0.011	0.000	0.000	0.00	1.264	0.0	0.0
2358.1	2358	709.57	2359	708.83	217.40	0.30%	8	0.011	0.000	0.000	0.00	0.539	0.0	0.0
2359.1	2359	708.83	2360	707.53	353.80	0.40%	8	0.011	0.008	0.770	0.13	0.560	1.3	20.2
2360.1	2360	707.53	1277	706.71	210.40	0.40%	8	0.011	0.008	0.800	0.05	0.576	1.3	7.1
2361.1	2361	665.44	2362	663.91	197.80	0.80%	8	0.012	0.000	0.000	0.00	0.744	0.0	0.0
2362.1	2362	663.91	1237	662.26	309.10	0.50%	8	0.012	0.004	0.680	0.03	0.618	0.7	4.3
2363.1	2363	650.81	419	649.70	145.10	0.80%	21	0.011	1.711	4.960	0.48	10.584	16.2	27.4
2364.1	2364	742.40	314	741.43	173.90	0.60%	6	0.013	0.193	2.120	0.34	0.271	71.4	67.4

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2365.1	2365	719.25	2367	718.23	183.10	0.60%	6	0.015	0.005	0.660	0.02	0.235	2.2	4.9
2366.1	2366	717.37	217	716.49	176.30	0.50%	6	0.015	0.012	0.900	0.06	0.222	5.3	12.2
2367.1	2367	718.23	2366	717.37	171.80	0.50%	6	0.015	0.007	0.740	0.04	0.222	2.9	7.7
2368.1	2368	702.68	2369	698.46	210.00	2.00%	8	0.011	0.001	0.530	0.00	1.308	0.1	0.7
2369.1	2369	698.46	2256	691.60	300.30	2.30%	8	0.011	0.006	0.600	0.01	1.395	0.4	1.8
2370.1	2370	701.63	2369	698.46	475.20	0.70%	8	0.011	0.002	0.540	0.18	0.754	0.3	27.2
2371.1	2371	701.24	567	687.05	127.60	11.10%	8	0.011	0.000	0.300	0.00	3.078	0.0	0.4
2372.1	2372	703.76	2370	701.63	411.30	0.50%	8	0.011	0.000	0.300	0.00	0.664	0.0	0.4
2373.1	2373	754.67	302	753.30	280.70	0.50%	8	0.011	0.008	0.810	0.19	0.645	1.3	27.8
2374.1	2374	771.26	2285	770.85	60.60	0.70%	8	0.011	0.008	0.750	0.04	0.759	1.1	5.5
2375.1	2375	772.23	2374	771.26	175.00	0.60%	8	0.011	0.006	0.720	0.04	0.687	0.9	5.4
2376.1	2376	777.06	2375	772.23	58.90	8.20%	8	0.011	0.006	0.630	0.02	2.644	0.2	2.4
2377.1	2377	778.26	2376	777.06	145.80	0.80%	8	0.011	0.005	0.640	0.02	0.837	0.6	3.0
2378.1	2378	777.95	2379	775.00	203.80	1.40%	8	0.011	0.000	0.270	0.00	1.110	0.0	0.4
2379.1	2379	775.00	2374	771.26	112.20	3.30%	8	0.011	0.001	0.530	0.00	1.685	0.1	0.6
2380.1	2380	779.36	2377	778.26	303.90	0.40%	8	0.011	0.002	0.640	0.02	0.555	0.4	3.6
2381.1	2381	780.00	2380	779.36	61.30	1.00%	8	0.011	0.002	0.540	0.01	0.944	0.2	0.8
2382.1	2382	791.76	2381	780.00	317.40	3.70%	8	0.011	0.000	0.270	0.00	1.777	0.0	0.4
2383.1	2383	786.98	2377	778.26	215.00	4.10%	8	0.011	0.001	0.530	0.00	1.859	0.0	0.6
2384.1	2384	671.03	2385	670.07	266.70	0.40%	8	0.011	0.000	0.460	0.10	0.554	0.1	14.9
2385.1	2385	670.07	2386	668.99	298.20	0.40%	8	0.011	0.001	0.530	0.00	0.556	0.3	0.7
2386.1	2386	668.99	2387	668.45	128.90	0.40%	8	0.011	0.003	0.610	0.02	0.597	0.5	2.5
2387.1	2387	668.45	2388	660.83	397.00	1.90%	8	0.011	0.003	0.590	0.56	1.279	0.2	83.8
2388.1	2388	660.83	2389	660.24	145.20	0.40%	8	0.011	0.003	0.600	0.02	0.588	0.5	2.4
2389.1	2389	660.24	2390	659.30	246.60	0.40%	8	0.011	0.003	0.590	0.01	0.570	0.5	2.0
2390.1	2390	659.30	2395	659.10	30.70	0.70%	8	0.011	0.003	0.590	0.01	0.745	0.4	2.0
2391.1	2391	655.23	2392	653.33	528.20	0.40%	8	0.011	0.003	0.550	0.01	0.554	0.5	0.9
2392.1	2392	653.33	682	652.54	311.80	0.30%	15	0.011	0.115	1.400	0.20	2.484	4.6	16.0
2393.1	2393	656.79	2391	655.23	429.20	0.40%	8	0.011	0.003	0.610	0.02	0.556	0.5	2.7
2394.1	2394	657.76	2393	656.79	255.30	0.40%	8	0.011	0.003	0.640	0.12	0.569	0.5	18.0
2395.1	2395	659.10	2394	657.76	365.20	0.40%	8	0.011	0.003	0.610	0.11	0.559	0.5	17.0
2396.1	2396	682.59	2397	682.11	141.90	0.30%	8	0.011	0.000	0.000	0.00	0.537	0.0	0.0
2397.1	2397	682.11	2398	681.91	158.10	0.10%	8	0.011	0.000	0.000	0.00	0.328	0.0	0.0
2398.1	2398	681.91	2399	681.47	143.00	0.30%	8	0.011	0.000	0.000	0.00	0.512	0.0	0.0
2399.1	2399	681.47	2400	681.03	229.70	0.20%	8	0.011	0.000	0.000	0.00	0.404	0.0	0.0
2400.1	2400	681.03	2401	680.04	261.50	0.40%	8	0.011	0.000	0.000	0.10	0.568	0.0	14.9
2401.1	2401	680.04	2403	678.79	337.00	0.40%	8	0.011	0.045	1.110	0.16	0.562	8.1	23.6
2402.1	2402	681.12	2401	680.04	286.80	0.40%	8	0.011	0.000	0.000	0.11	0.566	0.0	16.2
2403.1	2403	678.79	983	677.81	287.70	0.30%	8	0.011	0.045	1.110	0.26	0.539	8.4	38.3
2404.1	2404	708.24	242	707.55	118.20	0.60%	4	0.015	0.000	0.000	0.00	0.082	0.0	0.0

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2405.1	2405	706.17	241	705.55	102.70	0.60%	6	0.015	0.000	0.000	0.00	0.244	0.0	0.0
2406.1	2406	704.65	239	697.70	284.90	2.40%	6	0.015	0.032	1.310	0.50	0.491	6.5	100.0
2407.1	2407	718.10	2408	717.28	143.70	0.60%	6	0.011	0.000	0.000	0.00	0.324	0.0	0.0
2408.1	2408	717.28	2409	715.70	296.50	0.50%	6	0.011	0.000	0.000	0.16	0.313	0.0	31.6
2409.1	2409	715.70	2410	713.90	340.20	0.50%	6	0.011	0.000	0.000	0.00	0.312	0.0	0.0
2410.1	2410	713.90	2347	705.65	16.20	51.10%	8	0.011	0.000	0.000	0.00	6.596	0.0	0.0
2413.1	2413	781.07	2415	778.18	114.40	2.50%	8	0.011	0.000	0.000	0.00	1.467	0.0	0.0
2414.1	2414	785.87	2415	778.18	211.60	3.60%	8	0.011	0.000	0.000	0.00	1.760	0.0	0.0
2415.1	2415	778.18	2135	775.60	168.60	1.50%	8	0.011	0.000	0.000	0.00	1.142	0.0	0.0
2416.1	2416	728.09	1936	722.77	79.10	6.70%	12	0.011	0.040	1.140	0.07	7.056	0.6	6.5
2417.1	2417	730.89	2416	728.09	293.70	1.00%	12	0.011	0.040	1.330	0.38	2.657	1.5	38.4
2418.1	2418	735.11	2417	730.89	341.30	1.20%	12	0.011	0.040	1.290	0.10	3.026	1.3	9.6
2419.1	2419	738.67	2418	735.11	343.00	1.00%	12	0.011	0.040	1.310	0.10	2.772	1.4	10.1
2420.1	2420	741.92	2419	738.67	314.80	1.00%	12	0.011	0.040	1.310	0.10	2.765	1.4	10.1
2421.1	2421	745.15	2420	741.92	301.70	1.10%	12	0.011	0.039	1.310	0.10	2.816	1.4	10.0
2422.1	2422	750.65	2004	745.38	102.20	5.20%	12	0.011	0.000	0.000	0.00	6.180	0.0	0.0
2423.1	2423	748.76	2421	745.15	359.00	1.00%	12	0.011	0.039	1.330	0.36	2.729	1.4	36.4
2424.1	2424	751.59	2423	748.76	359.90	0.80%	12	0.011	0.039	1.270	0.31	2.413	1.6	31.3
2425.1	2425	753.54	2424	751.59	249.20	0.80%	12	0.011	0.039	1.300	0.30	2.407	1.6	30.4
2426.1	2426	754.21	2425	753.54	79.20	0.80%	12	0.011	0.039	1.300	0.11	2.503	1.6	10.9
2427.1	2427	760.73	2005	759.05	463.80	0.40%	8	0.011	0.000	0.000	0.09	0.556	0.0	14.0
2428.1	2428	683.66	715	676.49	208.00	3.40%	8	0.011	0.001	0.530	0.00	1.714	0.0	0.6
2429.1	2429	685.08	727	676.28	319.40	2.80%	8	0.011	0.001	0.530	0.00	1.532	0.1	0.7
2431.1	2431	778.76	2432	776.10	354.70	0.70%	8	0.011	0.001	0.520	0.19	0.799	0.1	29.0
2432.1	2432	776.10	904	768.75	42.30	17.40%	8	0.011	0.005	0.570	0.01	3.847	0.1	1.0
2434.1	2434	649.61	2242	636.41	279.70	4.70%	8	0.011	0.002	0.540	0.67	2.005	0.1	100.0
2435.1	2435	673.69	2129	672.15	424.90	0.40%	8	0.011	0.043	1.080	0.15	0.556	7.7	23.1
2436.1	2436	683.21	1266	682.44	114.40	0.70%	12	0.011	0.053	1.460	0.12	2.233	2.4	12.4
2437.1	2437	701.89	2064	698.82	501.50	0.60%	12	0.012	0.767	3.540	0.44	1.952	39.3	44.3
2438.1	2438	651.80	970	651.42	100.50	0.40%	10	0.011	0.116	1.700	0.21	1.029	11.3	24.8
2439.1	2439	727.00	1455	701.70	347.50	7.30%	8	0.011	0.000	0.000	0.00	2.491	0.0	0.0
2440.1	2440	715.00	1480	712.60	148.40	1.60%	8	0.011	0.000	0.000	0.00	1.174	0.0	0.0
2441.1	2441	682.31	2220	677.47	238.00	2.00%	8	0.011	0.019	0.960	0.06	1.316	1.4	9.5
2442.1	2442	666.41	1068	665.15	257.50	0.50%	8	0.011	0.031	1.000	0.25	0.646	4.8	38.2
2443.1	2443	724.26	172	723.21	301.50	0.30%	8	0.015	0.194	1.620	0.35	0.399	48.5	52.4
2444.1	2444	730.60	1051	724.55	362.50	1.70%	8	0.012	0.000	0.000	0.43	1.093	0.0	64.8
2445.1	2445	701.58	582	701.58	68.60	0.00%	8	0.011	0.000	0.000	0.14	0.000	(N/A)	20.7
2446.1	2446	703.20	2445	701.58	296.20	0.50%	8	0.011	0.000	0.000	0.16	0.683	0.0	24.3
2447.1	2447	704.56	2446	703.20	392.10	0.30%	8	0.011	0.000	0.000	0.10	0.544	0.0	14.6
2448.1	2448	705.62	2447	704.56	256.50	0.40%	8	0.011	0.000	0.000	0.11	0.593	0.0	15.9

Appendix 1.2

Existing System Wet Weather Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2449.1	2449	702.90	755	702.00	296.80	0.30%	8	0.011	0.000	0.000	0.09	0.508	0.0	13.5
2450.1	2450	704.63	2449	702.90	320.90	0.50%	8	0.011	0.000	0.000	0.00	0.678	0.0	0.0
2451.1	2451	712.58	2475	708.01	474.50	1.00%	8	0.011	0.000	0.000	0.25	0.906	0.0	38.1
2452.1	2452	677.09	958	675.09	397.00	0.50%	8	0.011	0.000	0.000	0.14	0.655	0.0	21.4
2453.1	2453	687.55	2452	677.09	165.30	6.30%	8	0.011	0.000	0.000	0.00	2.322	0.0	0.0
2454.1	2454	690.40	2453	687.55	419.00	0.70%	8	0.011	0.000	0.000	0.00	0.761	0.0	0.0
2455.1	2455	698.25	2454	690.40	312.10	2.50%	8	0.011	0.000	0.000	0.00	1.464	0.0	0.0
2456.1	2456	734.86	2359	708.83	49.40	52.70%	6	0.011	0.008	0.610	0.01	3.110	0.2	2.2
2457.1	2457	737.43	2456	734.86	69.40	3.70%	6	0.011	0.008	0.670	0.02	0.825	0.9	4.4
2458.1	2458	744.96	2457	737.43	433.10	1.70%	6	0.011	0.000	0.000	0.00	0.565	0.0	0.0
2459.1	2459	746.32	2458	744.96	90.80	1.50%	6	0.011	0.000	0.000	0.00	0.525	0.0	0.0
2460.1	2460	673.54	2264	670.40	262.70	1.20%	8	0.011	0.033	0.820	0.33	1.009	3.3	49.0
2461.1	2461	674.30	2460	673.54	132.60	0.60%	8	0.011	0.016	0.980	0.07	0.699	2.3	10.6
2462.1	2462	678.53	2461	674.30	253.10	1.70%	8	0.011	0.004	0.600	0.44	1.193	0.4	65.4
2463.1	2463	684.03	2462	678.53	164.00	3.40%	8	0.011	0.002	0.550	0.01	1.690	0.1	1.0
2464.1	2464	688.86	2463	684.03	144.70	3.30%	8	0.011	0.000	0.000	0.00	1.686	0.0	0.0
2465.1	2465	682.68	2466	680.26	117.70	2.10%	8	0.011	0.000	0.000	0.00	1.323	0.0	0.0
2466.1	2466	680.26	2467	675.75	111.60	4.00%	8	0.011	0.002	0.550	0.01	1.856	0.1	1.0
2467.1	2467	675.75	2461	674.30	271.10	0.50%	8	0.011	0.012	0.880	0.20	0.675	1.7	30.3
2468.1	2468	676.45	2467	675.75	122.50	0.60%	8	0.011	0.010	0.800	0.05	0.698	1.4	6.8
2469.1	2469	677.67	2468	676.45	221.40	0.60%	8	0.011	0.007	0.740	0.04	0.685	0.9	5.6
2470.1	2470	678.42	2469	677.67	102.70	0.70%	8	0.011	0.004	0.610	0.02	0.789	0.5	2.4
2471.1	2471	679.22	2470	678.42	112.10	0.70%	8	0.011	0.004	0.610	0.02	0.780	0.5	2.5
2472.1	2472	680.18	2471	679.22	136.70	0.70%	8	0.011	0.003	0.580	0.01	0.774	0.4	1.8
2473.1	2473	684.59	2472	680.18	118.00	3.70%	8	0.011	0.000	0.290	0.00	1.784	0.0	0.4
2474.1	2474	682.66	2472	680.18	148.70	1.70%	8	0.011	0.000	0.000	0.00	1.192	0.0	0.0
2475.1	2475	708.01	2449	702.90	437.10	1.20%	8	0.011	0.000	0.000	0.00	0.998	0.0	0.0
2476.1	2476	656.02	961	655.67	58.10	0.60%	8	0.011	0.025	1.090	0.11	0.717	3.5	15.8
2477.1	2477	648.54	611	647.34	221.30	0.50%	10	0.012	0.167	2.230	0.22	1.130	14.8	26.6
2478.1	2478	778.73	2164	778.29	836.40	0.10%	8	0.013	0.016	0.410	0.15	0.179	9.0	22.9
2479.1	2479	781.50	LS_BMS	780.83	414.40	0.20%	8	0.013	0.030	0.130	0.67	0.314	9.7	100.0
3343.1	334	695.20	375	692.37	135.60	2.10%	10	0.015	0.879	4.680	0.44	1.773	49.6	52.5
CO-1	2100	657.90	W-4	657.80	12.10	0.80%	12	0.013	0.003	0.620	0.02	2.090	0.1	1.8
CO-10	MH-10	742.80	1982	738.59	1216.00	0.30%	8	0.013	0.081	1.280	0.22	0.460	17.6	32.3

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
0.1	0	673.52	2	672.16	312.80	0.40%	21	0.011	0.019	0.970	0.07	7.980	0.2	3.8
1.1	1	675.14	0	673.52	372.50	0.40%	21	0.011	0.017	0.930	0.17	7.982	0.2	10.0
2.1	2	672.16	30	671.65	86.10	0.60%	21	0.011	0.047	1.200	0.11	9.313	0.5	6.1
3.1	3	676.75	1	675.14	381.60	0.40%	21	0.011	0.016	0.900	0.17	7.861	0.2	9.7
4.1	4	679.10	3	676.75	448.80	0.50%	21	0.011	0.015	0.870	0.18	8.758	0.2	10.4
5.1	5	681.47	4	679.10	446.30	0.50%	21	0.011	0.014	0.870	0.05	8.819	0.2	3.0
6.1	6	682.93	5	681.47	274.70	0.50%	21	0.011	0.013	0.800	0.19	8.822	0.1	10.6
7.1	7	683.56	6	682.93	103.80	0.60%	21	0.011	0.012	0.820	0.05	9.426	0.1	2.6
8.1	8	689.40	7	683.56	446.50	1.30%	8	0.011	0.004	0.590	0.01	1.056	0.4	1.7
9.1	9	694.00	8	689.40	445.40	1.00%	8	0.011	0.004	0.600	0.01	0.938	0.4	2.0
10.1	10	696.31	9	694.00	349.20	0.70%	8	0.011	0.000	0.000	0.17	0.751	0.0	24.8
11.1	11	700.50	10	696.31	272.80	1.50%	8	0.011	0.000	0.000	0.42	1.144	0.0	62.8
12.1	12	653.54	899	652.26	388.60	0.30%	27	0.011	2.148	3.810	0.70	13.576	15.8	31.2
13.1	13	654.43	12	653.54	85.80	1.00%	24	0.011	0.292	3.200	0.18	17.593	1.7	9.1
14.1	14	655.55	13	654.43	316.90	0.40%	24	0.011	0.289	2.100	0.24	10.272	2.8	12.0
15.1	15	656.27	14	655.55	346.00	0.20%	24	0.011	0.283	1.730	0.27	7.882	3.6	13.5
16.1	16	656.70	15	656.27	338.70	0.10%	24	0.011	0.276	1.450	0.30	6.157	4.5	15.0
17.1	17	657.72	16	656.70	421.80	0.20%	24	0.011	0.268	1.790	0.25	8.497	3.1	12.7
18.1	18	658.65	17	657.72	394.20	0.20%	24	0.011	0.259	1.760	0.32	8.393	3.1	15.9
19.1	19	659.20	18	658.65	285.50	0.20%	24	0.011	0.206	1.500	0.29	7.583	2.7	14.7
20.1	20	659.93	19	659.20	349.70	0.20%	24	0.011	0.199	1.530	0.28	7.895	2.5	14.1
21.1	21	661.25	20	659.93	501.00	0.30%	24	0.011	0.192	1.640	0.21	8.870	2.2	10.7
22.1	22	662.00	21	661.25	476.00	0.20%	24	0.011	0.185	1.350	0.28	6.859	2.7	14.0
23.1	23	662.60	22	662.00	281.20	0.20%	24	0.011	0.178	1.480	0.28	7.982	2.2	13.9
24.1	24	663.55	23	662.60	337.80	0.30%	24	0.011	0.174	1.610	0.20	9.164	1.9	10.1
25.1	25	663.80	24	663.55	360.70	0.10%	24	0.011	0.169	0.990	0.29	4.549	3.7	14.7
26.1	26	664.50	25	663.80	334.30	0.20%	24	0.011	0.163	1.420	0.21	7.907	2.1	10.6
27.1	27	665.80	26	664.50	522.70	0.20%	24	0.011	0.158	1.490	0.20	8.617	1.8	10.0
28.1	28	667.87	2204	667.73	42.90	0.30%	15	0.011	0.099	1.460	0.18	2.819	3.5	14.0
29.1	29	669.70	2205	667.20	355.70	0.70%	21	0.011	0.049	1.300	0.28	10.145	0.5	16.1
30.1	30	671.65	29	669.70	351.80	0.60%	21	0.011	0.048	1.140	0.25	9.011	0.5	14.4
31.1	31	666.20	18	658.65	451.50	1.70%	12	0.011	0.049	1.350	0.51	3.519	1.4	51.5
32.1	32	673.90	31	666.20	506.40	1.50%	12	0.011	0.048	1.360	0.10	3.356	1.4	9.8
33.1	33	679.85	34	678.86	166.80	0.60%	12	0.011	1.746	4.570	0.70	2.096	83.3	70.4
34.1	34	678.86	35	678.05	142.10	0.60%	12	0.011	1.746	4.490	0.71	2.055	85.0	71.5
35.1	35	678.05	36	676.54	277.00	0.50%	12	0.011	1.744	4.390	0.88	2.009	86.8	88.1
36.1	36	676.54	37	675.74	230.60	0.30%	12	0.011	1.746	3.750	0.86	1.603	108.9	86.2
37.1	37	675.74	38	675.04	200.00	0.30%	12	0.011	1.744	3.810	0.84	1.610	108.3	84.4
38.1	38	675.04	39	674.46	159.70	0.40%	12	0.011	1.742	3.830	0.84	1.640	106.3	83.9
39.1	39	674.46	40	673.85	170.30	0.40%	12	0.011	1.741	3.910	0.82	1.629	106.9	82.0

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
40.1	40	673.85	41	673.38	124.90	0.40%	12	0.011	1.741	3.940	0.81	1.670	104.2	81.3
41.1	41	673.38	42	672.99	118.00	0.30%	12	0.011	1.739	3.810	0.84	1.564	111.2	84.4
42.1	42	672.99	43	672.60	117.50	0.30%	12	0.011	1.738	3.700	0.87	1.568	110.9	87.3
43.1	43	672.60	44	672.02	190.90	0.30%	12	0.011	1.738	3.660	0.88	1.500	115.9	88.5
44.1	44	672.02	45	671.63	132.10	0.30%	12	0.011	1.736	3.850	0.83	1.479	117.4	83.1
45.1	45	671.63	2031	662.61	600.40	1.50%	12	0.011	1.729	3.400	1.00	3.335	51.8	100.0
46.1	46	674.83	39	674.46	90.30	0.40%	6	0.011	0.000	0.000	0.50	0.274	0.0	100.0
47.1	47	675.32	46	674.83	78.20	0.60%	6	0.011	0.000	0.000	0.30	0.339	0.0	59.8
48.1	48	694.42	986	686.84	264.20	2.90%	8	0.011	0.006	0.660	0.67	1.563	0.4	100.0
49.1	49	667.50	985	656.99	205.40	5.10%	8	0.011	0.027	1.070	0.07	2.088	1.3	10.9
50.1	50	650.00	1422	644.14	61.20	9.60%	8	0.011	0.070	1.450	0.08	2.856	2.5	12.3
51.1	51	654.46	50	650.00	233.00	1.90%	8	0.011	0.057	1.490	0.11	1.277	4.4	16.6
52.1	52	655.00	51	654.46	109.20	0.50%	8	0.011	0.057	1.400	0.16	0.649	8.7	23.6
53.1	53	655.40	52	655.00	76.70	0.50%	8	0.011	0.057	1.420	0.15	0.667	8.5	23.2
54.1	54	666.51	53	655.40	362.20	3.10%	8	0.011	0.045	1.300	0.67	1.616	2.8	100.0
55.1	55	676.70	54	666.51	172.90	5.90%	8	0.011	0.041	1.200	0.08	2.241	1.8	11.6
56.1	56	677.21	55	676.70	102.80	0.50%	8	0.011	0.039	1.140	0.14	0.650	6.0	20.7
57.1	57	682.00	56	677.21	186.00	2.60%	8	0.011	0.000	0.000	0.00	1.481	0.0	0.0
58.1	58	677.82	56	677.21	129.70	0.50%	8	0.011	0.032	1.010	0.13	0.633	5.1	19.9
59.1	59	678.40	58	677.82	126.00	0.50%	8	0.011	0.030	0.960	0.13	0.626	4.7	19.5
60.1	60	679.20	59	678.40	115.90	0.70%	8	0.011	0.015	0.970	0.07	0.767	1.9	10.6
61.1	61	681.69	60	679.20	258.50	1.00%	8	0.011	0.003	0.560	0.26	0.906	0.3	38.4
62.1	62	702.98	59	678.40	405.80	6.10%	8	0.011	0.000	0.000	0.00	2.272	0.0	0.0
63.1	63	695.01	65	694.44	133.40	0.40%	8	0.011	0.012	0.900	0.06	0.603	1.9	9.3
64.1	64	695.53	63	695.01	120.30	0.40%	8	0.011	0.000	0.000	0.00	0.607	0.0	0.0
65.1	65	694.44	66	685.22	327.00	2.80%	8	0.011	0.017	0.870	0.05	1.550	1.1	7.2
66.1	66	685.22	67	677.24	325.00	2.50%	8	0.011	0.029	1.150	0.09	1.446	2.0	13.0
67.1	67	677.24	68	672.47	71.80	6.60%	8	0.011	0.040	1.180	0.08	2.378	1.7	11.3
68.1	68	672.47	69	669.67	164.50	1.70%	8	0.011	0.043	1.350	0.10	1.204	3.6	15.6
69.1	69	669.67	70	667.40	163.30	1.40%	8	0.011	0.046	1.410	0.11	1.088	4.2	16.7
70.1	70	667.40	71	662.40	163.70	3.10%	8	0.011	0.051	1.380	0.10	1.613	3.2	14.3
71.1	71	662.40	1420	652.06	166.60	6.20%	8	0.011	0.070	1.490	0.09	2.300	3.0	13.5
72.1	72	663.75	73	663.36	83.40	0.50%	8	0.011	0.000	0.000	0.00	0.631	0.0	0.0
73.1	73	663.36	71	662.40	245.60	0.40%	8	0.011	0.006	0.700	0.03	0.577	1.1	4.6
74.1	74	705.06	75	705.02	140.20	0.00%	8	0.011	0.000	0.000	0.02	0.156	0.0	3.1
75.1	75	705.02	76	703.27	501.80	0.30%	8	0.011	0.006	0.760	0.04	0.545	1.2	6.2
76.1	76	703.27	77	697.90	462.60	1.20%	8	0.011	0.019	0.980	0.36	0.995	1.9	54.7
77.1	77	697.90	78	685.43	350.00	3.60%	8	0.011	0.034	1.170	0.67	1.742	1.9	100.0
78.1	78	685.43	79	658.55	404.10	6.70%	8	0.011	0.044	1.230	0.08	2.380	1.9	11.6
79.1	79	658.55	80	651.67	94.70	7.30%	8	0.011	0.059	1.370	0.08	2.488	2.4	12.4

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
80.1	80	651.67	81	650.87	295.10	0.30%	27	0.011	2.306	3.650	0.74	12.317	18.7	33.0
81.1	81	650.87	1927	650.30	233.80	0.20%	27	0.011	2.366	3.580	0.68	11.681	20.3	30.4
82.1	82	663.40	81	650.87	92.60	13.50%	8	0.011	0.060	1.330	0.07	3.396	1.8	11.0
83.1	83	688.12	82	663.40	373.40	6.60%	8	0.011	0.046	1.250	0.67	2.375	2.0	100.0
84.1	84	689.87	83	688.12	500.90	0.30%	8	0.011	0.031	0.900	0.14	0.546	5.8	21.2
85.1	85	691.62	84	689.87	500.70	0.30%	8	0.011	0.016	0.920	0.09	0.546	3.0	13.3
86.1	86	693.00	85	691.62	389.10	0.40%	8	0.011	0.006	0.720	0.13	0.550	1.1	19.9
87.1	87	699.30	874	681.90	436.50	4.00%	8	0.011	0.020	0.970	0.06	1.843	1.1	9.3
88.1	88	700.95	87	699.30	390.30	0.40%	8	0.011	0.000	0.000	0.12	0.600	0.0	17.7
89.1	89	701.00	880	688.60	242.40	5.10%	8	0.011	0.000	0.000	0.00	2.088	0.0	0.0
90.1	90	705.70	91	680.30	328.80	7.70%	8	0.011	0.000	0.000	0.00	2.565	0.0	0.0
91.1	91	680.30	873	680.20	500.20	0.00%	8	0.011	0.015	0.420	0.14	0.131	11.3	21.4
92.1	92	702.44	93	686.30	440.30	3.70%	8	0.011	0.153	2.420	0.15	1.767	8.7	22.1
93.1	93	686.30	94	662.79	395.50	5.90%	8	0.011	0.192	2.690	0.67	2.250	8.5	100.0
94.4	94	662.79	862	661.88	206.30	0.40%	8	0.011	0.259	2.440	0.32	0.613	42.2	47.6
95.1	95	646.34	1256	645.68	278.90	0.20%	27	0.011	2.721	3.680	0.81	11.507	23.6	35.9
96.1	96	610.53	616	609.06	287.30	0.50%	8	0.011	0.220	2.450	0.43	0.660	33.3	64.0
97.1	97	612.22	96	610.53	158.90	1.10%	8	0.011	0.008	0.710	0.03	0.952	0.9	4.2
98.1	98	611.72	96	610.53	217.90	0.50%	8	0.011	0.202	2.420	0.26	0.682	29.7	39.7
99.1	99	613.71	98	611.72	377.00	0.50%	8	0.011	0.189	2.350	0.40	0.671	28.1	59.9
100.1	100	615.41	99	613.71	297.30	0.60%	8	0.011	0.178	2.370	0.41	0.698	25.5	62.2
101.1	101	620.83	100	615.41	323.50	1.70%	8	0.011	0.059	1.430	0.09	1.195	4.9	14.1
102.1	102	615.77	100	615.41	298.30	0.10%	8	0.011	0.101	1.100	0.28	0.321	31.5	42.7
103.1	103	616.36	102	615.77	451.40	0.10%	8	0.011	0.004	0.690	0.07	0.334	1.1	9.8
104.1	104	624.00	102	615.77	305.80	2.70%	8	0.011	0.077	1.680	0.12	1.514	5.1	17.6
105.1	105	633.04	104	624.00	309.80	2.90%	8	0.011	0.052	1.400	0.10	1.577	3.3	15.0
106.1	106	627.92	104	624.00	305.30	1.30%	8	0.011	0.007	0.650	0.02	1.046	0.7	2.8
107.1	107	639.00	105	633.04	226.20	2.60%	8	0.011	0.003	0.560	0.01	1.498	0.2	1.1
108.1	108	643.85	614	642.87	98.30	1.00%	8	0.011	0.003	0.560	0.01	0.921	0.3	1.2
109.1	109	744.16	110	735.13	447.50	2.00%	8	0.011	0.005	0.610	0.52	1.311	0.4	77.5
110.1	110	735.13	111	728.55	216.70	3.00%	8	0.011	0.023	1.030	0.07	1.608	1.5	10.4
111.1	111	728.55	112	721.77	229.60	3.00%	8	0.011	0.032	1.170	0.08	1.586	2.0	12.6
112.1	112	721.77	113	717.15	205.10	2.30%	8	0.011	0.039	1.280	0.09	1.385	2.8	14.2
113.1	113	717.15	114	715.96	218.10	0.50%	8	0.011	0.047	1.290	0.15	0.682	6.9	21.8
114.1	114	715.96	115	715.37	98.60	0.60%	8	0.011	0.055	0.240	0.67	0.714	7.7	100.0
115.1	115	715.37	116	714.67	119.40	0.60%	8	0.011	0.057	0.250	0.67	0.707	8.0	100.0
116.1	116	714.67	1650	711.15	327.40	1.10%	8	0.012	0.060	0.270	0.67	0.877	6.9	100.0
117.1	117	739.67	118	727.99	335.10	3.50%	8	0.011	0.002	0.540	0.00	1.723	0.1	0.7
118.1	118	727.99	119	720.49	289.50	2.60%	8	0.011	0.010	0.700	0.67	1.486	0.6	100.0
119.1	119	720.49	1004	709.38	330.20	3.40%	8	0.012	0.108	0.480	0.67	1.552	6.9	100.0

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
120.1	120	727.93	121	726.79	41.00	2.80%	8	0.011	0.002	0.540	0.01	1.539	0.1	0.8
121.1	121	726.79	119	720.49	344.40	1.80%	8	0.011	0.015	0.890	0.06	1.248	1.2	8.3
122.1	122	735.54	121	726.79	283.00	3.10%	8	0.011	0.003	0.580	0.67	1.623	0.2	100.0
123.1	123	673.19	2	672.16	227.70	0.50%	12	0.011	0.028	0.930	0.11	1.830	1.5	10.9
124.1	124	684.13	123	673.19	298.60	3.70%	12	0.011	0.028	1.060	0.07	5.208	0.5	7.0
125.1	125	692.09	124	684.13	239.70	3.30%	12	0.011	0.028	1.030	0.06	4.959	0.6	6.4
126.1	126	695.66	125	692.09	361.90	1.00%	12	0.011	0.000	0.000	0.26	2.703	0.0	25.5
127.1	127	697.50	126	695.66	368.20	0.50%	12	0.011	0.000	0.000	0.13	1.924	0.0	13.1
128.1	128	698.43	127	697.50	185.00	0.50%	12	0.011	0.000	0.000	0.00	1.929	0.0	0.0
129.1	129	700.76	128	698.43	446.10	0.50%	12	0.011	0.000	0.000	0.00	1.967	0.0	0.0
130.1	130	717.02	131	716.00	102.00	1.00%	6	0.011	0.000	0.000	0.00	0.429	0.0	0.0
131.1	131	716.00	132	715.52	47.90	1.00%	6	0.011	0.000	0.000	0.00	0.429	0.0	0.0
132.1	132	715.52	133	709.67	64.50	9.10%	6	0.011	0.000	0.000	0.00	1.290	0.0	0.0
133.1	133	709.67	135	706.84	214.90	1.30%	8	0.011	0.000	0.000	0.00	1.059	0.0	0.0
134.1	134	707.75	135	706.84	43.50	2.10%	6	0.011	0.000	0.000	0.00	0.620	0.0	0.0
135.1	135	706.84	129	700.76	470.60	1.30%	8	0.011	0.000	0.000	0.34	1.049	0.0	50.7
136.1	136	713.39	133	709.67	293.00	1.30%	8	0.011	0.000	0.000	0.37	1.040	0.0	55.8
137.1	137	716.11	136	713.39	99.70	2.70%	8	0.011	0.000	0.000	0.00	1.525	0.0	0.0
138.1	138	717.89	137	716.11	337.00	0.50%	8	0.011	0.000	0.000	0.00	0.671	0.0	0.0
139.1	139	719.03	138	717.89	208.00	0.50%	8	0.011	0.000	0.000	0.00	0.683	0.0	0.0
140.1	140	721.63	139	719.03	499.90	0.50%	8	0.011	0.000	0.000	0.00	0.666	0.0	0.0
141.1	141	722.22	140	721.63	49.40	1.20%	6	0.011	0.000	0.000	0.00	0.469	0.0	0.0
142.1	142	722.51	141	722.22	18.70	1.60%	6	0.011	0.000	0.000	0.00	0.534	0.0	0.0
143.1	143	723.12	142	722.51	12.20	5.00%	4	0.011	0.000	0.000	0.00	0.325	0.0	0.0
144.1	144	723.91	143	723.12	79.50	1.00%	4	0.011	0.000	0.000	0.00	0.145	0.0	0.0
145.1	145	704.04	127	697.50	262.80	2.50%	8	0.011	0.000	0.000	0.65	1.456	0.0	98.1
146.1	146	745.33	1136	740.04	499.20	1.10%	8	0.013	0.000	0.000	0.00	0.804	0.0	0.0
146.2	146	745.33	147	738.44	257.80	2.70%	8	0.011	0.001	0.520	0.67	1.509	0.0	100.0
147.1	147	738.44	1137	735.43	500.00	0.60%	8	0.013	0.002	0.540	0.01	0.606	0.3	0.8
148.1	148	738.72	147	738.44	59.70	0.50%	8	0.011	0.000	0.280	0.00	0.632	0.0	0.4
149.1	149	725.31	1138	724.06	61.50	2.00%	8	0.013	0.012	0.770	0.04	1.113	1.1	5.3
150.1	150	729.80	149	725.31	257.50	1.70%	8	0.013	0.006	0.690	0.48	1.031	0.6	71.6
151.1	151	748.88	157	745.99	555.00	0.50%	6	0.015	0.000	0.000	0.13	0.227	0.0	26.3
152.1	152	748.33	157	745.99	460.20	0.50%	6	0.015	0.000	0.000	0.13	0.224	0.0	26.0
153.1	153	746.01	159	743.41	502.90	0.50%	6	0.015	0.000	0.000	0.00	0.226	0.0	0.0
154.1	154	736.63	166	733.53	520.90	0.60%	6	0.015	0.073	1.360	0.22	0.242	29.9	43.7
155.1	155	740.50	154	736.63	649.10	0.60%	6	0.015	0.071	1.360	0.36	0.243	29.3	72.9
156.1	156	741.50	155	740.50	167.30	0.60%	6	0.015	0.069	1.370	0.21	0.243	28.3	41.7
157.1	157	745.99	158	745.23	124.20	0.60%	6	0.015	0.000	0.000	0.00	0.246	0.0	0.0
158.1	158	745.23	159	743.41	295.90	0.60%	6	0.015	0.000	0.000	0.18	0.247	0.0	36.4

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
159.1	159	743.41	553	742.47	154.10	0.60%	6	0.015	0.000	0.000	0.00	0.245	0.0	0.0
160.1	160	741.76	155	740.50	251.60	0.50%	6	0.015	0.001	0.530	0.13	0.222	0.4	26.0
161.1	161	734.74	166	733.53	305.70	0.40%	8	0.015	0.288	1.910	0.42	0.426	67.6	63.2
162.1	162	736.66	161	734.74	236.20	0.80%	6	0.015	0.007	0.520	0.08	0.283	2.5	16.3
163.1	163	740.03	162	736.66	163.60	2.10%	6	0.015	0.000	0.000	0.00	0.451	0.0	0.0
164.1	164	741.26	163	740.03	225.70	0.50%	6	0.015	0.000	0.000	0.00	0.232	0.0	0.0
165.1	165	738.68	162	736.66	386.60	0.50%	6	0.015	0.000	0.000	0.14	0.227	0.0	28.9
166.1	166	733.53	167	732.30	342.00	0.40%	8	0.015	0.361	1.930	0.51	0.406	89.0	77.2
167.1	167	732.30	168	726.49	108.70	5.30%	8	0.015	0.363	4.430	0.23	1.565	23.2	33.8
168.1	168	726.49	169	725.06	369.00	0.40%	8	0.015	0.368	2.000	0.61	0.421	87.4	91.5
169.1	169	725.06	2443	724.26	218.30	0.40%	8	0.015	0.374	1.980	0.52	0.410	91.4	78.3
170.1	170	732.20	169	725.06	233.20	3.10%	6	0.015	0.002	0.550	0.01	0.550	0.4	1.6
171.1	171	733.36	170	732.20	213.20	0.50%	6	0.015	0.000	0.000	0.00	0.232	0.0	0.0
172.1	172	723.21	173	722.34	169.30	0.50%	8	0.015	0.394	1.800	0.62	0.485	81.2	93.3
173.1	173	722.34	189	720.57	465.80	0.40%	8	0.015	0.394	1.750	0.67	0.417	94.4	100.0
174.1	174	744.50	172	723.21	576.10	3.70%	6	0.015	0.000	0.000	0.50	0.604	0.0	100.0
175.1	175	739.50	167	732.30	184.30	3.90%	6	0.015	0.000	0.000	0.00	0.621	0.0	0.0
176.1	176	735.00	171	733.36	293.30	0.60%	6	0.015	0.000	0.000	0.16	0.235	0.0	32.8
177.1	177	721.04	178	720.16	156.50	0.60%	6	0.015	0.000	0.000	0.00	0.236	0.0	0.0
178.1	178	720.16	179	718.03	405.60	0.50%	6	0.015	0.000	0.000	0.18	0.228	0.0	35.8
179.1	179	718.03	180	715.92	265.70	0.80%	6	0.015	0.000	0.000	0.50	0.280	0.0	100.0
180.1	180	715.92	190	715.74	302.60	0.10%	8	0.015	0.439	1.940	0.67	0.165	265.7	100.0
181.1	181	723.61	182	722.99	103.60	0.60%	6	0.015	0.000	0.000	0.00	0.243	0.0	0.0
182.1	182	722.99	183	722.65	47.80	0.70%	6	0.015	0.000	0.000	0.00	0.265	0.0	0.0
183.1	183	722.65	184	721.75	161.00	0.60%	6	0.015	0.000	0.000	0.00	0.235	0.0	0.0
184.1	184	721.75	186	721.48	33.80	0.80%	6	0.015	0.000	0.000	0.00	0.281	0.0	0.0
185.1	185	722.07	184	721.75	43.60	0.70%	6	0.015	0.000	0.000	0.00	0.269	0.0	0.0
186.1	186	721.48	189	720.57	162.10	0.60%	6	0.015	-0.001	0.000	0.50	0.236	-0.2	100.0
187.1	187	722.40	186	721.48	164.50	0.60%	6	0.015	0.000	0.000	0.00	0.235	0.0	0.0
188.1	188	723.34	187	722.40	168.90	0.60%	6	0.015	0.000	0.000	0.00	0.235	0.0	0.0
189.1	189	720.57	180	715.92	564.50	0.80%	8	0.015	0.415	1.840	0.67	0.614	67.5	100.0
190.1	190	715.74	191	714.93	194.60	0.40%	8	0.015	0.464	2.050	0.67	0.437	106.2	100.0
191.1	191	714.93	192	713.93	238.80	0.40%	8	0.015	0.537	2.380	0.67	0.438	122.5	100.0
192.1	192	713.93	193	712.60	336.10	0.40%	8	0.015	0.541	2.400	0.67	0.426	127.0	100.0
193.1	193	712.60	194	707.00	46.90	11.90%	8	0.015	0.541	5.790	0.22	2.339	23.1	33.4
194.1	194	707.00	2114	705.89	262.70	0.40%	12	0.015	0.630	2.470	0.61	1.297	48.5	61.3
195.1	195	704.50	197	691.90	277.30	4.50%	12	0.015	0.632	5.850	1.00	4.254	14.9	100.0
196.1	196	714.85	195	704.50	591.10	1.80%	10	0.015	0.001	0.530	0.47	1.624	0.1	57.0
197.1	197	691.90	230	682.00	431.70	2.30%	12	0.015	0.701	4.740	0.33	3.022	23.2	33.3
198.1	198	719.00	192	713.93	316.10	1.60%	6	0.015	0.001	0.520	0.00	0.398	0.1	0.7

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
199.1	199	709.26	194	707.00	438.70	0.50%	8	0.015	0.087	1.360	0.22	0.486	17.9	32.7
200.1	200	709.89	199	709.26	171.00	0.40%	8	0.015	0.086	1.230	0.23	0.411	21.0	34.9
201.1	201	722.90	200	709.89	472.30	2.80%	6	0.015	0.006	0.710	0.50	0.522	1.1	100.0
202.1	202	724.73	201	722.90	352.50	0.50%	6	0.015	0.000	0.000	0.13	0.227	0.0	26.1
203.1	203	729.19	190	715.74	670.20	2.00%	6	0.015	0.027	1.260	0.50	0.445	6.2	100.0
204.1	204	730.77	203	729.19	292.90	0.50%	6	0.015	0.001	0.530	0.16	0.231	0.4	32.4
205.1	205	737.31	203	729.19	142.80	5.70%	6	0.015	0.002	0.540	0.01	0.750	0.2	1.0
206.1	206	738.79	205	737.31	276.60	0.50%	6	0.015	0.000	0.000	0.15	0.230	0.0	29.6
207.1	207	723.98	201	722.90	197.00	0.50%	6	0.015	0.000	0.000	0.00	0.233	0.0	0.0
208.1	208	736.46	203	729.19	529.10	1.40%	6	0.015	0.015	1.000	0.08	0.368	4.0	15.4
209.1	209	738.99	208	736.46	506.60	0.50%	6	0.015	0.004	0.720	0.04	0.222	1.9	7.5
210.1	210	739.98	213	731.19	570.70	1.50%	6	0.015	0.038	1.390	0.50	0.390	9.7	100.0
211.1	211	740.66	210	739.98	177.30	0.40%	6	0.015	0.003	0.560	0.01	0.195	1.6	1.3
212.1	212	741.49	211	740.66	217.30	0.40%	6	0.015	0.003	0.550	0.01	0.194	1.6	1.2
213.1	213	731.19	214	723.19	497.50	1.60%	6	0.015	0.045	1.540	0.14	0.399	11.2	27.8
214.1	214	723.19	215	710.68	402.00	3.10%	6	0.015	0.047	1.460	0.12	0.554	8.5	23.9
215.1	215	710.68	200	709.89	173.70	0.50%	8	0.015	0.081	1.300	0.21	0.457	17.6	31.9
216.1	216	714.99	215	710.68	327.60	1.30%	8	0.015	0.031	1.130	0.12	0.776	4.0	18.0
217.1	217	716.49	216	714.99	300.70	0.50%	6	0.015	0.013	0.730	0.10	0.222	5.9	19.8
218.1	218	718.32	2366	717.37	189.70	0.50%	6	0.015	0.005	0.600	0.01	0.222	2.1	2.5
219.1	219	734.40	218	718.32	470.10	3.40%	6	0.015	0.002	0.540	0.50	0.581	0.3	100.0
220.1	220	723.94	221	722.83	201.10	0.60%	6	0.015	0.000	0.000	0.00	0.234	0.0	0.0
221.1	221	722.83	1975	721.50	246.80	0.50%	6	0.015	0.003	0.560	0.01	0.231	1.4	1.2
222.1	222	723.64	221	722.83	142.20	0.60%	6	0.015	0.000	0.000	0.00	0.237	0.0	0.0
223.1	223	720.15	2365	719.25	159.70	0.60%	6	0.015	0.004	0.610	0.01	0.236	1.9	3.0
224.1	224	720.98	223	720.15	145.60	0.60%	6	0.015	0.000	0.000	0.00	0.237	0.0	0.0
225.1	225	716.39	227	715.57	199.30	0.40%	8	0.015	0.008	0.730	0.03	0.434	1.9	5.1
226.1	226	717.22	225	716.39	145.10	0.60%	8	0.015	0.000	0.000	0.00	0.512	0.0	0.0
227.1	227	715.57	216	714.99	133.60	0.40%	8	0.015	0.008	0.780	0.04	0.446	1.8	6.4
228.1	228	743.30	212	741.49	622.10	0.30%	6	0.015	0.003	0.650	0.02	0.170	1.8	4.9
229.1	229	747.50	228	743.30	515.20	0.80%	6	0.015	0.001	0.530	0.00	0.284	0.3	0.9
230.1	230	682.00	231	674.50	441.50	1.70%	12	0.015	0.702	4.250	0.36	2.601	27.0	36.1
231.1	231	674.50	232	670.88	174.90	2.10%	12	0.015	0.701	4.570	0.34	2.871	24.4	34.2
232.1	232	670.88	2027	667.80	157.90	2.00%	12	0.015	0.701	4.470	0.35	2.787	25.2	34.7
233.1	233	668.26	2027	660.23	115.90	6.90%	12	0.015	0.002	0.550	0.01	5.252	0.0	0.6
234.1	234	658.45	1970	657.88	310.30	0.20%	18	0.015	2.423	2.660	1.12	2.522	96.1	74.4
235.1	235	657.00	2015	656.42	188.50	0.30%	18	0.013	2.431	3.630	0.85	3.766	64.6	56.8
236.1	236	657.17	235	657.00	37.40	0.50%	12	0.015	0.015	0.030	0.82	1.346	1.1	82.0
237.1	237	659.02	236	657.17	288.50	0.60%	12	0.015	0.003	0.060	0.32	1.598	0.2	32.2
238.1	238	659.51	2187	659.32	46.30	0.40%	8	0.015	0.000	0.320	0.00	0.434	0.1	0.4

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
239.1	239	697.70	197	691.90	207.30	2.80%	6	0.015	0.069	1.740	0.14	0.526	13.1	28.3
240.1	240	704.75	2406	704.65	204.90	0.00%	6	0.015	0.068	0.690	0.36	0.069	97.6	72.7
241.1	241	705.55	240	704.75	266.30	0.30%	6	0.015	0.000	0.000	0.08	0.172	0.0	16.0
242.1	242	707.55	241	705.55	409.40	0.50%	6	0.015	0.000	0.000	0.00	0.220	0.0	0.0
243.1	243	711.60	244	710.49	200.50	0.60%	6	0.015	0.001	0.520	0.00	0.234	0.2	0.7
244.1	244	710.49	245	709.76	123.40	0.60%	6	0.015	0.001	0.530	0.00	0.242	0.6	1.0
245.1	245	709.76	251	708.48	167.40	0.80%	8	0.015	0.035	0.930	0.15	0.592	5.9	22.2
246.1	246	711.15	245	709.76	160.40	0.90%	8	0.015	0.033	1.010	0.13	0.630	5.2	20.0
247.1	247	714.95	246	711.15	349.30	1.10%	6	0.015	0.031	1.100	0.41	0.328	9.5	81.7
248.1	248	724.50	247	714.95	326.70	2.90%	6	0.015	0.024	1.160	0.10	0.537	4.5	19.1
249.1	249	736.98	2198	736.11	152.20	0.60%	6	0.015	0.024	0.950	0.12	0.238	9.9	24.8
250.1	250	741.68	249	736.98	363.40	1.30%	6	0.015	0.001	0.520	0.34	0.357	0.1	67.9
251.1	251	708.48	260	705.68	330.80	0.80%	8	0.015	0.173	2.150	0.26	0.623	27.7	38.5
252.1	252	715.49	251	708.48	367.20	1.90%	8	0.015	0.131	2.430	0.67	0.935	14.0	100.0
253.1	253	727.00	252	715.49	333.80	3.40%	8	0.015	0.126	2.250	0.16	1.257	10.0	23.3
254.1	254	727.00	253	727.00	264.80	0.00%	8	0.015	0.125	0.730	0.47	0.000	Infinity	70.8
255.1	255	732.91	254	727.00	173.80	3.40%	8	0.015	0.084	0.950	0.28	1.248	6.8	41.6
256.1	256	733.65	255	732.91	355.20	0.20%	8	0.015	0.051	0.780	0.27	0.309	16.5	41.1
257.1	257	734.49	256	733.65	147.60	0.60%	6	0.015	0.001	0.530	0.00	0.237	0.3	0.8
258.1	258	709.25	259	705.40	275.00	1.40%	6	0.015	0.000	0.000	0.39	0.372	0.0	77.0
259.1	259	705.40	273	700.76	485.70	1.00%	6	0.015	0.002	0.610	0.28	0.307	0.7	55.2
260.1	260	705.68	272	703.10	310.90	0.80%	8	0.015	0.203	2.260	0.28	0.617	32.9	41.9
261.1	261	710.00	272	703.10	350.80	2.00%	8	0.015	0.018	0.460	0.65	0.949	1.9	96.9
262.1	262	725.97	261	710.00	354.00	4.50%	8	0.015	0.003	0.560	0.67	1.438	0.2	100.0
263.1	263	743.75	264	736.02	524.60	1.50%	6	0.015	0.001	0.520	0.00	0.382	0.1	0.7
264.1	264	736.02	256	733.65	241.40	1.00%	6	0.015	0.050	1.370	0.16	0.311	15.9	32.7
265.1	265	739.11	264	736.02	335.00	0.90%	6	0.015	0.015	1.030	0.08	0.302	5.0	16.4
266.1	266	740.73	265	739.11	146.30	1.10%	6	0.015	0.013	0.940	0.07	0.331	3.8	13.5
267.1	267	742.01	266	740.73	113.00	1.10%	6	0.015	0.011	0.900	0.06	0.334	3.4	12.4
268.1	268	748.12	267	742.01	500.70	1.20%	6	0.015	0.008	0.790	0.05	0.347	2.2	9.2
269.1	269	749.28	268	748.12	211.40	0.50%	6	0.015	0.007	0.700	0.03	0.233	3.0	5.8
270.1	270	749.60	269	749.28	43.30	0.70%	6	0.015	0.000	0.000	0.00	0.270	0.0	0.0
271.1	271	750.94	269	749.28	311.30	0.50%	6	0.015	0.001	0.530	0.00	0.230	0.6	0.9
272.1	272	703.10	273	700.76	287.50	0.80%	8	0.015	0.248	1.120	0.67	0.611	40.6	100.0
273.1	273	700.76	333	697.30	356.20	1.00%	8	0.015	0.303	1.340	0.67	0.667	45.4	100.0
274.1	274	718.31	260	705.68	366.00	3.50%	8	0.015	0.009	0.770	0.67	1.257	0.7	100.0
275.1	275	726.65	274	718.31	332.40	2.50%	8	0.015	0.005	0.580	0.01	1.072	0.5	1.3
276.1	276	742.43	267	742.01	64.00	0.70%	6	0.015	0.000	0.000	0.00	0.255	0.0	0.0
277.1	277	742.30	266	740.73	294.90	0.50%	4	0.015	0.000	0.000	0.16	0.078	0.0	47.1
278.1	278	739.78	2110	739.45	23.20	1.40%	10	0.013	0.088	1.910	0.14	1.687	5.2	17.4

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
279.1	279	742.13	278	739.78	281.70	0.80%	8	0.013	0.000	0.420	0.24	0.713	0.0	35.7
280.1	280	743.36	556	740.60	265.80	1.00%	6	0.015	0.001	0.530	0.28	0.320	0.4	56.2
281.1	281	742.20	556	740.60	243.40	0.70%	10	0.013	0.085	1.620	0.17	1.148	7.4	20.5
282.1	282	743.67	298	743.18	135.80	0.40%	6	0.015	0.045	0.910	0.21	0.189	23.6	41.1
283.1	283	745.27	282	743.67	238.90	0.70%	6	0.015	0.045	1.180	0.17	0.257	17.3	33.8
284.1	284	746.03	283	745.27	122.10	0.60%	6	0.015	0.045	1.120	0.18	0.248	18.0	35.1
285.1	285	747.83	2111	746.57	203.20	0.60%	6	0.015	0.045	1.150	0.17	0.248	18.1	34.6
286.1	286	744.24	1972	743.26	244.20	0.40%	8	0.013	0.001	0.520	0.00	0.495	0.1	0.5
287.1	287	745.00	288	744.26	156.20	0.50%	8	0.013	0.001	0.520	0.00	0.538	0.1	0.5
288.1	288	744.26	1972	743.26	249.50	0.40%	8	0.013	0.036	0.890	0.26	0.494	7.3	38.5
289.1	289	749.33	288	744.26	334.30	1.50%	8	0.013	0.034	1.310	0.11	0.962	3.5	16.6
290.1	290	754.35	291	751.78	260.50	1.00%	8	0.013	0.032	1.150	0.38	0.776	4.1	56.7
291.1	291	751.78	289	749.33	248.90	1.00%	8	0.013	0.033	1.170	0.37	0.775	4.3	55.1
292.1	292	757.41	290	754.35	309.60	1.00%	6	0.015	0.032	1.070	0.14	0.312	10.1	28.2
293.1	293	758.48	292	757.41	189.20	0.60%	6	0.015	0.028	0.930	0.14	0.236	11.7	28.4
294.1	294	759.94	297	759.03	182.10	0.50%	6	0.015	0.000	0.300	0.00	0.222	0.1	0.5
295.1	295	760.93	297	759.03	146.40	1.30%	6	0.015	0.002	0.540	0.00	0.358	0.4	1.0
296.1	296	764.31	295	760.93	252.10	1.30%	6	0.015	0.001	0.520	0.34	0.364	0.1	68.3
297.1	297	759.03	1973	758.49	331.70	0.20%	6	0.015	0.002	0.630	0.02	0.127	1.8	4.4
298.1	298	743.18	281	742.20	243.90	0.40%	8	0.013	0.045	1.050	0.16	0.495	9.1	24.5
299.1	299	749.72	285	747.83	252.00	0.70%	6	0.015	0.045	1.160	0.36	0.272	16.5	72.1
300.1	300	751.74	299	749.72	232.00	0.90%	6	0.015	0.045	1.260	0.16	0.293	15.3	32.3
301.1	301	755.36	300	751.80	712.00	0.50%	6	0.015	0.000	0.000	0.00	0.222	0.0	0.0
302.1	302	753.30	300	751.74	190.10	0.80%	6	0.015	0.010	0.880	0.06	0.285	3.6	12.1
303.1	303	754.32	302	753.30	163.20	0.60%	6	0.015	0.002	0.540	0.01	0.249	0.7	1.0
304.1	304	755.74	303	754.32	263.50	0.50%	6	0.015	0.002	0.540	0.15	0.231	0.7	29.4
305.1	305	741.91	306	739.80	421.50	0.50%	6	0.015	0.001	0.520	0.00	0.222	0.3	0.8
306.1	306	739.70	313	738.00	319.70	0.50%	6	0.015	0.012	0.690	0.02	0.229	5.2	4.0
307.1	307	750.80	306	739.70	120.60	9.20%	6	0.015	0.000	0.000	0.00	0.954	0.0	0.0
308.1	308	738.55	309	737.86	117.20	0.60%	6	0.015	0.001	0.530	0.00	0.241	0.5	0.9
309.1	309	737.86	311	733.94	484.30	0.80%	6	0.015	0.010	0.770	0.26	0.283	3.7	51.0
310.1	310	739.04	323	738.35	117.70	0.60%	6	0.015	0.000	0.000	0.00	0.241	0.0	0.0
311.1	311	733.94	329	724.10	244.60	4.00%	6	0.015	0.378	4.400	0.32	0.630	59.9	64.1
312.1	312	736.00	311	733.94	187.30	1.10%	6	0.015	0.357	2.810	0.50	0.330	108.2	100.0
313.1	313	738.00	312	736.00	57.00	3.50%	6	0.015	0.357	3.090	0.43	0.589	60.7	85.3
314.1	314	741.43	313	738.00	145.80	2.40%	6	0.015	0.345	3.930	0.33	0.482	71.7	65.3
315.1	315	742.63	314	741.43	221.20	0.50%	6	0.013	0.000	0.000	0.00	0.267	0.0	0.0
316.1	316	742.47	2364	742.40	13.90	0.50%	6	0.015	0.344	2.710	0.50	0.223	154.6	100.0
317.1	317	768.00	320	757.47	60.90	17.30%	6	0.013	0.002	0.540	0.01	1.507	0.1	1.0
318.1	318	769.36	317	768.00	257.10	0.50%	6	0.013	0.002	0.540	0.14	0.264	0.7	28.2

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
319.1	319	769.92	317	768.00	163.90	1.20%	8	0.013	0.000	0.000	0.00	0.845	0.0	0.0
320.1	320	757.47	322	757.47	183.10	0.00%	6	0.013	0.250	1.970	0.50	0.000	Infinity	100.0
321.1	321	770.16	319	769.92	227.20	0.10%	6	0.015	0.000	0.000	0.00	0.102	0.0	0.0
322.1	322	757.47	316	742.47	468.80	3.20%	6	0.013	0.252	3.510	0.50	0.649	38.8	100.0
323.1	323	738.35	309	737.86	78.50	0.60%	6	0.015	0.008	0.790	0.05	0.248	3.0	9.1
324.1	324	726.86	325	725.87	177.50	0.60%	6	0.015	0.001	0.010	0.50	0.235	0.4	100.0
325.1	325	725.87	329	724.10	200.30	0.90%	6	0.015	0.012	0.090	0.50	0.295	3.9	100.0
326.1	326	727.19	325	725.87	244.60	0.50%	6	0.015	0.002	0.020	0.50	0.231	0.9	100.0
327.1	327	727.84	326	727.19	110.80	0.60%	6	0.015	0.001	0.010	0.50	0.241	0.4	100.0
328.1	328	728.29	327	727.84	69.50	0.60%	6	0.015	0.001	0.010	0.50	0.253	0.3	100.0
329.1	329	724.10	330	721.42	711.10	0.40%	6	0.015	0.299	2.360	0.50	0.193	155.1	100.0
330.1	330	721.42	2060	721.26	12.00	1.30%	6	0.015	0.343	3.150	0.40	0.364	94.3	80.0
331.1	331	710.76	332	705.13	321.60	1.80%	6	0.015	0.356	3.490	0.37	0.416	85.5	74.8
332.1	332	705.13	333	697.30	265.70	2.90%	6	0.015	0.361	4.330	0.50	0.540	66.8	100.0
333.1	333	697.30	2125	697.05	75.00	0.30%	8	0.015	0.661	2.930	0.67	0.391	169.2	100.0
335.1	335	697.04	1971	696.03	269.00	0.40%	8	0.015	0.105	0.470	0.67	0.415	25.4	100.0
336.1	336	697.88	335	697.04	217.50	0.40%	8	0.015	0.000	0.000	0.67	0.421	0.1	100.0
337.1	337	707.55	347	706.19	308.30	0.40%	8	0.015	0.113	0.500	0.67	0.450	25.2	100.0
338.1	338	709.20	337	707.55	455.90	0.40%	8	0.015	0.128	1.420	0.37	0.407	31.4	55.8
339.1	339	729.95	338	709.20	482.00	4.30%	8	0.015	0.039	1.280	0.67	1.404	2.8	100.0
340.1	340	731.32	339	729.95	380.20	0.40%	8	0.015	0.001	0.530	0.10	0.406	0.3	15.3
341.1	341	731.91	340	731.32	144.80	0.40%	8	0.015	0.000	0.000	0.00	0.432	0.0	0.0
342.1	342	730.53	339	729.95	116.00	0.50%	6	0.015	0.000	0.000	0.00	0.222	0.0	0.0
343.1	343	737.44	312	736.00	185.30	0.80%	6	0.015	0.000	0.000	0.40	0.277	0.0	80.7
344.1	344	696.05	334	695.20	299.30	0.30%	10	0.015	0.658	1.870	0.83	0.654	100.6	100.0
345.1	345	699.80	335	697.04	531.90	0.50%	6	0.015	0.000	0.000	0.50	0.226	0.0	100.0
346.1	346	698.52	334	695.20	312.60	1.10%	8	0.015	0.809	3.590	0.67	0.698	116.0	100.0
347.1	347	706.19	2124	705.59	60.00	1.00%	8	0.015	0.622	2.760	0.67	0.677	91.9	100.0
348.1	348	710.86	347	706.19	469.50	1.00%	8	0.015	0.370	2.930	0.62	0.675	54.8	93.7
349.1	349	711.19	348	710.86	45.40	0.70%	6	0.015	0.000	0.000	0.21	0.268	0.0	42.2
350.1	350	712.18	349	711.19	177.40	0.60%	6	0.015	0.000	0.000	0.00	0.235	0.0	0.0
351.1	351	707.50	352	701.65	576.60	1.00%	6	0.015	0.000	0.000	0.27	0.317	0.0	53.2
352.1	352	701.65	346	698.52	335.60	0.90%	6	0.015	0.148	1.170	0.50	0.304	48.8	100.0
353.1	353	704.86	352	701.65	340.70	0.90%	6	0.015	0.101	1.840	0.22	0.305	33.2	44.7
354.1	354	709.90	353	704.86	577.80	0.90%	6	0.015	0.000	0.000	0.23	0.294	0.0	45.8
355.1	355	697.98	356	696.75	216.90	0.60%	6	0.015	0.022	1.050	0.11	0.237	9.4	22.4
356.1	356	696.75	357	691.45	358.80	1.50%	6	0.015	0.035	1.320	0.50	0.382	9.2	100.0
357.1	357	691.45	376	689.53	401.30	0.50%	6	0.015	0.089	1.360	0.25	0.217	40.7	50.9
358.1	358	693.13	357	691.45	321.60	0.50%	6	0.015	0.045	1.010	0.19	0.227	19.7	38.0
359.1	359	695.37	358	693.13	449.70	0.50%	6	0.015	0.044	1.000	0.31	0.222	19.6	62.4

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
360.1	360	699.80	359	695.37	361.10	1.20%	6	0.015	0.023	1.080	0.43	0.348	6.5	85.6
361.1	361	701.25	362	699.65	311.80	0.50%	6	0.015	0.000	0.000	0.00	0.225	0.0	0.0
362.1	362	699.65	355	697.98	315.30	0.50%	6	0.015	0.009	0.730	0.08	0.229	4.1	15.7
363.1	363	702.17	360	699.80	453.00	0.50%	6	0.015	0.000	0.000	0.13	0.227	0.0	26.3
364.1	364	711.75	365	706.80	574.20	0.90%	6	0.015	0.000	0.000	0.23	0.292	0.0	45.0
365.1	365	706.80	353	704.86	337.30	0.60%	6	0.015	0.046	1.050	0.19	0.238	19.2	37.4
366.1	366	714.02	365	706.80	183.30	3.90%	6	0.015	0.001	0.530	0.00	0.624	0.2	0.9
367.1	367	715.47	366	714.02	270.30	0.50%	6	0.015	0.000	0.000	0.15	0.230	0.0	29.0
368.1	368	713.41	1298	713.02	85.40	0.50%	8	0.015	0.138	1.520	0.28	0.457	30.1	42.2
369.1	369	714.27	374	713.84	93.60	0.50%	8	0.015	0.137	1.590	0.27	0.459	29.8	40.6
370.1	370	716.36	369	714.27	114.60	1.80%	8	0.015	0.086	1.960	0.17	0.914	9.5	25.0
371.1	371	718.97	370	716.36	149.00	1.80%	8	0.015	0.087	1.950	0.16	0.896	9.7	23.5
372.1	372	722.61	373	719.66	515.00	0.60%	8	0.015	0.033	0.870	0.15	0.512	6.4	22.3
373.1	373	719.66	371	718.97	124.70	0.60%	8	0.015	0.076	1.350	0.20	0.504	15.0	29.7
374.1	374	713.84	554	713.61	50.60	0.50%	8	0.015	0.137	1.620	0.27	0.456	30.0	40.0
375.1	375	692.37	376	689.53	411.30	0.70%	10	0.015	1.565	4.440	0.83	1.020	153.5	100.0
376.1	376	689.53	378	685.91	132.20	2.70%	12	0.015	1.678	5.870	0.55	3.302	50.8	55.0
377.1	377	695.23	376	689.53	453.20	1.30%	6	0.015	0.004	0.670	0.35	0.353	1.1	69.0
378.1	378	685.91	379	684.27	204.40	0.80%	12	0.015	1.750	4.000	0.81	1.788	97.9	80.5
379.1	379	684.27	2025	682.06	275.60	0.80%	12	0.015	1.749	3.970	1.00	1.787	97.9	100.0
380.1	380	671.70	381	670.19	413.50	0.40%	8	0.015	0.000	0.000	0.00	0.409	0.0	0.0
381.1	381	670.19	233	668.26	539.10	0.40%	8	0.015	0.001	0.530	0.00	0.405	0.3	0.7
382.1	382	649.00	384	648.35	129.30	0.50%	8	0.012	0.504	2.910	0.48	0.600	84.1	71.7
383.1	383	655.60	382	649.00	122.70	5.40%	8	0.012	0.133	2.160	0.13	1.962	6.8	18.8
384.1	384	648.35	385	647.46	178.50	0.50%	8	0.012	0.510	2.880	0.49	0.597	85.3	73.1
385.1	385	647.46	LS_TP1	647.41	15.80	0.30%	8	0.012	0.517	2.960	0.48	0.493	104.9	72.4
386.1	386	658.90	383	655.60	405.70	0.80%	8	0.012	0.118	2.160	0.19	0.763	15.4	29.0
387.1	387	663.30	386	658.90	489.50	0.90%	8	0.012	0.099	2.090	0.42	0.802	12.4	63.0
388.1	388	665.59	387	663.30	254.70	0.90%	8	0.012	0.000	0.000	0.23	0.802	0.0	34.4
389.1	389	655.50	382	649.00	340.70	1.90%	8	0.012	0.176	2.790	0.19	1.169	15.1	27.9
390.1	390	656.21	389	655.50	141.20	0.50%	8	0.012	0.006	0.420	0.07	0.600	1.0	11.0
391.1	391	657.40	389	655.50	380.70	0.50%	8	0.012	0.007	0.720	0.17	0.598	1.1	25.6
392.1	392	659.27	389	655.50	289.80	1.30%	8	0.012	0.143	2.540	0.56	0.965	14.8	84.6
393.1	393	662.46	392	659.27	290.10	1.10%	8	0.012	0.027	1.220	0.42	0.887	3.1	63.1
394.1	394	664.54	393	662.46	174.60	1.20%	8	0.012	0.007	0.680	0.02	0.924	0.8	3.7
395.1	395	661.39	392	659.27	265.50	0.80%	8	0.012	0.100	2.010	0.39	0.756	13.2	59.0
396.1	396	662.20	395	661.39	150.30	0.50%	8	0.012	0.094	1.700	0.20	0.621	15.2	29.4
397.1	397	663.70	396	662.20	114.50	1.30%	8	0.012	0.094	2.010	0.16	0.968	9.7	23.4
398.1	398	664.86	397	663.70	219.00	0.50%	8	0.012	0.007	0.720	0.03	0.616	1.1	5.1
399.1	399	665.34	398	664.86	96.50	0.50%	8	0.012	0.003	0.620	0.02	0.597	0.6	2.9

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
400.1	400	664.64	397	663.70	312.80	0.30%	8	0.012	0.010	0.870	0.06	0.464	2.1	8.9
401.1	401	665.22	397	663.70	284.20	0.50%	8	0.012	0.057	1.340	0.31	0.619	9.2	47.1
402.1	402	666.70	401	665.22	298.80	0.50%	8	0.012	0.006	0.580	0.01	0.596	0.9	1.1
403.1	403	666.69	401	665.22	296.60	0.50%	8	0.012	0.038	1.060	0.29	0.596	6.4	43.8
404.1	404	667.92	403	666.69	245.50	0.50%	8	0.012	0.019	1.010	0.09	0.599	3.1	13.7
405.1	405	668.98	404	667.92	104.70	1.00%	8	0.012	0.015	0.890	0.05	0.851	1.7	8.2
406.1	406	670.70	405	668.98	349.20	0.50%	8	0.012	0.002	0.590	0.14	0.594	0.4	20.7
407.1	407	669.70	403	666.69	442.10	0.70%	8	0.012	0.003	0.580	0.01	0.698	0.4	1.8
408.1	408	666.50	387	663.30	292.70	1.10%	8	0.012	0.088	1.980	0.48	0.885	9.9	71.9
409.1	409	668.64	408	666.50	193.80	1.10%	8	0.012	0.024	1.090	0.08	0.889	2.6	12.2
410.1	410	671.08	409	668.64	154.80	1.60%	8	0.012	0.020	0.950	0.06	1.062	1.8	8.8
411.1	411	671.25	410	671.08	223.60	0.10%	8	0.012	0.011	0.590	0.09	0.233	4.8	13.8
412.1	412	672.50	411	671.25	256.10	0.50%	8	0.012	0.000	0.000	0.13	0.591	0.0	18.8
413.1	413	674.03	408	666.50	503.00	1.50%	8	0.012	0.040	1.370	0.11	1.035	3.8	16.8
414.1	414	676.37	413	674.03	232.50	1.00%	8	0.012	0.030	1.260	0.11	0.849	3.5	15.8
415.1	415	678.92	414	676.37	179.90	1.40%	8	0.012	0.023	1.040	0.07	1.007	2.3	10.9
416.1	416	683.72	415	678.92	550.80	0.90%	8	0.012	0.003	0.590	0.23	0.790	0.4	34.6
417.1	417	646.15	1929	646.07	179.70	0.00%	18	0.011	7.716	6.760	1.50	1.693	455.8	100.0
418.1	418	648.71	417	646.15	221.00	1.20%	21	0.011	6.992	4.500	1.75	13.025	53.7	100.0
419.1	419	649.70	418	648.71	197.30	0.50%	21	0.011	6.985	6.070	1.21	8.572	81.5	69.3
420.1	420	652.80	419	649.70	294.00	1.10%	6	0.012	0.031	1.270	0.43	0.403	7.7	86.6
421.1	421	655.48	420	652.80	363.40	0.70%	6	0.012	0.018	1.090	0.28	0.337	5.2	56.6
422.1	422	657.91	421	655.48	369.30	0.70%	6	0.012	0.005	0.680	0.20	0.319	1.5	40.6
423.1	423	647.98	417	646.15	261.50	0.70%	8	0.012	0.706	3.130	0.67	0.708	99.8	100.0
424.1	424	649.88	423	647.98	381.90	0.50%	8	0.012	0.691	3.060	0.67	0.597	115.7	100.0
425.1	425	651.91	424	649.88	396.00	0.50%	8	0.012	0.676	2.990	0.67	0.606	111.5	100.0
426.1	426	658.00	425	651.91	218.20	2.80%	6	0.012	0.000	0.000	0.00	0.656	0.0	0.0
427.1	427	653.12	861	652.16	194.40	0.50%	8	0.012	0.661	2.930	0.67	0.595	111.2	100.0
428.1	428	652.29	2363	650.81	177.40	0.80%	21	0.011	6.940	7.490	1.01	11.055	62.8	57.5
429.1	429	653.63	428	652.29	159.80	0.80%	21	0.011	6.694	7.440	0.98	11.081	60.4	56.2
430.1	430	656.17	429	653.63	487.60	0.50%	21	0.011	6.677	6.160	1.29	8.735	76.4	73.8
431.1	431	657.77	430	656.17	299.70	0.50%	21	0.011	6.666	6.170	1.15	8.842	75.4	65.6
432.1	432	660.27	431	657.77	459.00	0.50%	21	0.011	6.652	6.270	1.27	8.931	74.5	72.5
433.1	433	661.23	432	660.27	172.20	0.60%	21	0.011	6.644	6.170	1.14	9.037	73.5	65.4
434.1	434	653.28	428	652.29	147.10	0.70%	8	0.012	0.234	1.170	0.55	0.694	33.7	82.7
435.1	435	654.70	434	653.28	213.70	0.70%	8	0.012	0.226	2.560	0.28	0.690	32.8	41.5
436.1	436	656.20	435	654.70	300.90	0.50%	8	0.012	0.083	1.610	0.19	0.597	13.8	27.8
437.1	437	656.70	436	656.20	73.00	0.70%	6	0.012	0.049	1.400	0.16	0.325	15.0	31.9
438.1	438	659.14	437	656.70	426.20	0.60%	6	0.012	0.031	1.020	0.14	0.297	10.3	28.7
439.1	439	660.34	438	659.14	247.20	0.50%	6	0.012	0.022	1.010	0.11	0.274	8.0	22.7

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
440.1	440	661.45	439	660.34	216.30	0.50%	6	0.012	0.014	0.950	0.07	0.281	4.8	14.0
441.1	441	664.03	440	661.45	309.20	0.80%	6	0.012	0.003	0.630	0.02	0.359	0.7	4.3
442.1	442	658.35	436	656.20	173.00	1.20%	6	0.012	0.030	1.310	0.12	0.438	6.8	23.3
443.1	443	662.00	442	658.35	549.50	0.70%	6	0.012	0.009	0.830	0.22	0.320	2.7	43.6
444.1	444	659.20	442	658.35	220.50	0.40%	6	0.012	0.002	0.540	0.00	0.244	0.6	1.0
445.1	445	656.58	435	654.70	174.40	1.10%	8	0.012	0.143	2.570	0.20	0.879	16.2	29.4
446.1	446	658.32	445	656.58	348.00	0.50%	8	0.012	0.125	1.860	0.35	0.598	20.8	52.4
447.1	447	660.65	446	658.32	480.00	0.50%	8	0.012	0.107	1.730	0.34	0.590	18.2	51.3
448.1	448	663.00	447	660.65	382.30	0.60%	8	0.012	0.092	1.760	0.36	0.663	13.8	53.3
449.1	449	665.31	448	663.00	412.20	0.60%	8	0.012	0.067	1.490	0.17	0.633	10.6	25.4
450.1	450	665.31	449	665.31	103.90	0.00%	8	0.012	0.067	0.770	0.27	0.000	Infinity	40.7
451.1	451	666.45	450	665.31	100.10	1.10%	6	0.012	0.006	0.710	0.03	0.419	1.5	6.6
452.1	452	667.17	451	666.45	146.10	0.50%	6	0.012	0.000	0.000	0.00	0.276	0.0	0.0
453.1	453	666.79	2078	666.37	332.70	0.10%	21	0.011	6.594	4.270	1.71	4.300	153.4	97.6
454.1	454	671.98	455	671.17	140.30	0.60%	8	0.012	0.000	0.000	0.00	0.643	0.0	0.0
455.1	455	671.17	456	668.59	435.90	0.60%	8	0.012	0.014	0.950	0.07	0.651	2.2	10.3
456.1	456	668.59	457	667.14	242.60	0.60%	8	0.012	0.034	1.070	0.13	0.654	5.2	19.7
457.1	457	667.14	450	665.31	199.50	0.90%	8	0.012	0.055	1.120	0.18	0.810	6.7	26.7
458.1	458	680.85	2127	680.27	80.00	0.70%	8	0.011	0.215	2.760	0.25	0.786	27.4	37.7
459.1	459	661.85	460	660.69	292.30	0.40%	8	0.012	0.398	2.470	0.56	0.533	74.7	84.6
460.1	460	660.69	464	660.30	202.30	0.20%	8	0.012	0.428	2.080	0.57	0.372	115.3	85.8
461.1	461	663.41	460	660.69	544.10	0.50%	8	0.012	0.006	0.630	0.06	0.598	1.0	8.5
462.1	462	659.86	465	658.77	219.00	0.50%	8	0.012	0.456	2.800	0.45	0.597	76.4	67.8
463.1	463	662.10	462	659.86	515.10	0.40%	8	0.012	0.006	0.450	0.07	0.558	1.1	10.9
464.1	464	660.30	462	659.86	85.90	0.50%	8	0.012	0.432	2.840	0.43	0.605	71.3	63.8
465.1	465	658.77	466	658.27	99.30	0.50%	8	0.012	0.466	2.330	0.55	0.600	77.7	83.0
466.1	466	658.27	467	656.89	343.50	0.40%	8	0.012	0.481	2.130	0.67	0.536	89.7	100.0
467.1	467	656.89	1202	656.13	196.80	0.40%	8	0.012	0.497	2.200	0.67	0.526	94.4	100.0
468.1	468	662.83	459	661.85	242.80	0.40%	8	0.012	0.276	2.260	0.35	0.538	51.3	53.2
469.1	469	671.89	1223	665.37	634.70	1.00%	8	0.012	0.006	0.650	0.02	0.858	0.7	3.3
470.1	470	666.83	468	662.83	409.20	1.00%	8	0.012	0.170	2.650	0.22	0.837	20.3	32.6
471.1	471	669.96	470	666.83	214.10	1.50%	8	0.012	0.162	2.710	0.19	1.023	15.8	28.7
472.1	472	672.82	471	669.96	238.40	1.20%	8	0.012	0.154	2.680	0.20	0.927	16.6	29.6
473.1	473	675.32	472	672.82	451.60	0.60%	8	0.012	0.123	1.920	0.36	0.630	19.6	53.6
474.1	474	680.41	473	675.32	510.90	1.00%	8	0.012	0.008	0.600	0.01	0.845	1.0	1.2
475.1	475	719.96	476	716.53	666.30	0.50%	6	0.015	0.001	0.520	0.14	0.226	0.3	27.1
476.1	476	716.53	369	714.27	435.00	0.50%	6	0.015	0.036	0.900	0.18	0.227	16.0	35.4
477.1	477	723.81	371	718.97	275.60	1.80%	6	0.015	0.005	0.690	0.50	0.417	1.1	100.0
478.1	478	732.32	477	723.81	485.60	1.80%	6	0.015	0.003	0.640	0.50	0.416	0.7	99.1
479.1	479	736.56	478	732.32	469.60	0.90%	6	0.015	0.002	0.540	0.24	0.299	0.5	48.1

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
480.1	480	742.67	479	736.56	402.50	1.50%	6	0.015	0.000	0.300	0.00	0.387	0.1	0.5
481.1	481	725.78	482	724.45	266.00	0.50%	8	0.015	0.032	0.800	0.29	0.479	6.6	43.2
482.1	482	724.45	372	722.61	368.70	0.50%	8	0.015	0.032	0.840	0.28	0.478	6.6	42.1
483.1	483	726.74	481	725.78	171.70	0.60%	6	0.015	0.016	0.930	0.09	0.235	6.7	18.9
484.1	484	728.60	483	726.74	372.40	0.50%	6	0.015	0.000	0.520	0.14	0.222	0.2	27.2
485.1	485	729.49	486	726.86	506.90	0.50%	6	0.015	0.000	0.520	0.00	0.226	0.2	0.7
486.1	486	726.86	481	725.78	195.30	0.60%	8	0.015	0.016	1.010	0.08	0.503	3.2	11.4
487.1	487	761.54	488	760.16	376.80	0.40%	8	0.012	0.005	0.710	0.13	0.512	1.1	19.8
488.1	488	760.16	489	759.42	187.90	0.40%	8	0.012	0.021	0.960	0.10	0.531	4.0	15.3
489.1	489	759.42	490	758.65	198.20	0.40%	8	0.012	0.029	0.880	0.14	0.527	5.5	20.4
490.1	490	758.65	491	757.46	321.60	0.40%	8	0.012	0.036	0.920	0.15	0.515	7.0	23.0
491.1	491	757.46	494	756.75	179.60	0.40%	8	0.012	0.049	1.150	0.16	0.532	9.2	24.3
492.1	492	758.13	491	757.46	166.70	0.40%	8	0.012	0.006	0.690	0.03	0.536	1.0	4.4
493.1	493	758.63	492	758.13	117.40	0.40%	8	0.012	0.002	0.560	0.01	0.552	0.4	1.5
494.1	494	756.75	495	756.08	166.80	0.40%	8	0.012	0.057	1.210	0.18	0.536	10.7	26.3
495.1	495	756.08	496	755.49	143.20	0.40%	8	0.012	0.117	1.690	0.23	0.543	21.5	34.5
496.1	496	755.49	497	754.63	223.00	0.40%	8	0.012	0.122	1.690	0.24	0.525	23.2	35.6
497.1	497	754.63	498	753.55	286.90	0.40%	8	0.012	0.132	1.710	0.36	0.519	25.5	53.7
498.1	498	753.55	524	753.19	127.90	0.30%	12	0.012	0.156	1.590	0.25	1.323	11.8	24.8
499.1	499	753.94	498	753.55	143.60	0.30%	12	0.012	0.007	0.570	0.06	1.300	0.5	5.7
500.1	500	754.30	499	753.94	131.60	0.30%	12	0.012	0.001	0.530	0.00	1.305	0.1	0.4
501.1	501	757.05	495	756.08	255.90	0.40%	8	0.012	0.047	1.070	0.26	0.521	9.0	39.4
502.1	502	757.55	501	757.05	146.90	0.30%	8	0.012	0.042	0.990	0.16	0.494	8.4	24.2
503.1	503	758.58	502	757.55	273.20	0.40%	8	0.012	0.027	0.760	0.24	0.520	5.1	36.6
504.1	504	759.38	503	758.58	205.40	0.40%	8	0.012	0.020	0.970	0.10	0.528	3.7	14.4
505.1	505	759.78	504	759.38	88.40	0.50%	8	0.012	0.017	0.970	0.09	0.569	3.0	13.2
506.1	506	760.54	505	759.78	193.60	0.40%	8	0.012	0.002	0.630	0.02	0.530	0.4	3.5
507.1	507	761.43	505	759.78	456.70	0.40%	8	0.012	0.000	0.000	0.09	0.509	0.0	13.7
508.1	508	759.47	509	759.17	59.10	0.50%	6	0.012	0.007	0.790	0.05	0.280	2.6	9.2
509.1	509	759.17	510	758.76	89.90	0.50%	8	0.012	0.009	0.810	0.05	0.571	1.5	7.2
510.1	510	758.76	512	756.78	551.70	0.40%	8	0.012	0.025	0.800	0.22	0.507	4.9	33.1
511.1	511	759.06	510	758.76	57.60	0.50%	8	0.012	0.014	0.980	0.07	0.611	2.3	11.0
512.1	512	756.78	513	755.64	306.90	0.40%	8	0.012	0.037	0.930	0.15	0.516	7.2	23.1
513.1	513	755.64	518	754.64	294.60	0.30%	8	0.012	0.050	1.110	0.27	0.493	10.2	40.5
514.1	514	756.17	513	755.64	127.00	0.40%	8	0.012	0.003	0.620	0.02	0.547	0.6	2.7
515.1	515	757.48	516	756.60	230.50	0.40%	8	0.012	0.002	0.540	0.01	0.523	0.3	0.8
516.1	516	756.60	517	755.66	245.70	0.40%	8	0.012	0.104	1.600	0.22	0.523	19.9	33.1
517.1	517	755.66	518	754.64	299.70	0.30%	8	0.012	0.109	1.530	0.24	0.494	22.2	35.3
518.1	518	754.64	519	753.52	299.70	0.40%	8	0.012	0.176	1.900	0.29	0.517	34.0	43.0
519.1	519	753.52	521	753.01	150.30	0.30%	8	0.012	0.202	1.920	0.32	0.493	40.9	47.3

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
520.1	520	755.07	519	753.52	425.70	0.40%	8	0.012	0.003	0.630	0.02	0.511	0.6	3.2
521.1	521	753.01	522	752.26	191.70	0.40%	8	0.012	0.204	2.030	0.30	0.529	38.6	45.7
522.1	522	752.26	2062	752.00	81.30	0.30%	12	0.012	0.422	2.410	0.38	1.411	29.9	37.7
523.1	523	752.73	522	752.26	186.10	0.30%	12	0.012	0.188	1.640	0.28	1.254	15.0	27.7
524.1	524	753.19	523	752.73	181.40	0.30%	12	0.012	0.159	1.540	0.26	1.256	12.7	25.7
526.1	526	757.98	516	756.60	377.40	0.40%	8	0.012	0.090	1.450	0.31	0.512	17.5	46.6
527.1	527	764.56	528	758.33	63.10	9.90%	8	0.012	0.073	1.490	0.09	2.659	2.7	12.8
528.1	528	758.33	526	757.98	74.40	0.50%	8	0.012	0.088	1.580	0.20	0.580	15.2	29.6
529.1	529	778.00	530	768.40	206.60	4.60%	8	0.012	0.003	0.570	0.01	1.824	0.2	1.4
530.1	530	768.40	531	765.40	66.40	4.50%	8	0.012	0.013	0.790	0.04	1.799	0.7	5.7
531.1	531	765.40	532	762.80	145.10	1.80%	8	0.012	0.013	0.830	0.05	1.133	1.1	7.0
532.1	532	762.80	533	760.84	371.30	0.50%	8	0.012	0.025	0.960	0.25	0.615	4.0	38.1
533.1	533	760.84	541	757.16	332.50	1.10%	8	0.012	0.087	1.960	0.16	0.890	9.7	23.7
534.1	534	776.58	533	760.84	259.80	6.10%	8	0.012	0.007	0.670	0.67	2.082	0.3	100.0
535.1	535	780.86	534	776.58	108.30	4.00%	8	0.012	0.002	0.550	0.01	1.682	0.1	1.0
536.1	536	784.00	537	778.00	125.40	4.80%	8	0.012	0.004	0.590	0.01	1.851	0.2	1.8
537.1	537	778.00	538	775.00	129.50	2.30%	8	0.012	0.011	0.820	0.05	1.288	0.9	6.9
538.1	538	775.00	539	768.65	289.80	2.20%	8	0.012	0.016	0.910	0.67	1.252	1.3	100.0
539.1	539	768.65	533	760.84	320.40	2.40%	8	0.012	0.027	1.140	0.09	1.321	2.0	13.1
540.1	540	758.97	541	757.16	185.60	1.00%	8	0.012	0.005	0.640	0.02	0.835	0.6	2.9
541.1	541	757.16	548	743.98	466.30	2.80%	8	0.012	0.104	1.980	0.67	1.422	7.3	100.0
542.1	542	749.50	543	748.45	82.10	1.30%	8	0.012	0.007	0.670	0.02	0.957	0.7	3.4
543.1	543	748.45	544	747.79	133.40	0.50%	8	0.012	0.010	0.840	0.05	0.595	1.7	7.8
544.1	544	747.79	545	742.52	208.20	2.50%	8	0.012	0.015	0.890	0.06	1.346	1.1	8.3
545.1	545	742.52	552	738.40	189.90	2.20%	8	0.012	0.022	1.030	0.07	1.246	1.7	10.8
546.1	546	738.08	551	735.42	78.90	3.40%	8	0.012	0.130	2.210	0.14	1.553	8.4	21.0
547.1	547	742.22	546	738.08	97.60	4.20%	8	0.012	0.127	2.130	0.13	1.743	7.3	19.6
548.1	548	743.98	547	742.22	98.00	1.80%	8	0.012	0.122	2.240	0.16	1.134	10.7	24.1
549.1	549	728.76	1588	727.30	303.50	0.50%	10	0.012	0.249	2.300	0.29	1.064	23.4	34.6
550.1	550	730.90	1587	729.99	34.60	2.60%	8	0.012	0.178	2.740	0.17	1.371	13.0	25.8
551.1	551	735.42	550	730.90	354.70	1.30%	8	0.012	0.162	2.750	0.52	0.955	17.0	78.2
552.1	552	738.40	551	735.42	163.70	1.80%	8	0.012	0.028	1.220	0.10	1.142	2.4	15.1
553.1	553	742.47	1139	741.73	120.90	0.60%	6	0.015	0.069	1.370	0.21	0.246	28.1	41.9
554.1	554	713.61	368	713.41	43.20	0.50%	8	0.015	0.137	1.650	0.26	0.460	29.8	39.6
555.1	555	716.96	554	713.61	129.00	2.60%	6	0.015	0.000	0.450	0.00	0.507	0.1	0.6
556.1	556	740.60	278	739.78	104.90	0.80%	10	0.013	0.087	1.740	0.17	1.252	6.9	19.9
557.1	557	697.38	359	695.37	390.50	0.50%	6	0.015	0.006	0.720	0.18	0.226	2.8	35.8
558.1	558	698.73	557	697.38	271.90	0.50%	6	0.015	0.001	0.530	0.14	0.222	0.3	27.8
559.1	559	718.63	2367	718.23	59.60	0.70%	6	0.015	0.000	0.000	0.00	0.258	0.0	0.0
560.1	560	688.08	567	687.05	314.50	0.30%	10	0.011	0.024	0.950	0.10	0.958	2.5	12.6

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
561.1	561	701.29	562	692.37	424.00	2.10%	8	0.011	0.000	0.000	0.00	1.339	0.0	0.0
562.1	562	692.37	568	674.85	398.50	4.40%	8	0.011	0.002	0.540	0.01	1.935	0.1	0.8
563.1	563	695.35	566	693.50	504.50	0.40%	8	0.011	0.001	0.530	0.00	0.559	0.1	0.6
564.1	564	703.55	565	700.89	516.40	0.50%	8	0.011	0.001	0.530	0.00	0.662	0.1	0.6
565.1	565	700.89	566	693.50	290.20	2.50%	8	0.011	0.003	0.580	0.67	1.473	0.2	100.0
566.1	566	693.50	560	688.08	290.80	1.90%	8	0.011	0.005	0.620	0.56	1.260	0.4	83.7
567.1	567	687.05	570	686.18	260.60	0.30%	10	0.011	0.025	0.950	0.19	0.967	2.6	23.3
568.1	568	674.85	572	673.17	348.00	0.50%	12	0.011	0.006	0.680	0.15	1.891	0.3	14.6
569.1	569	695.94	574	687.92	396.20	2.00%	8	0.011	0.002	0.540	0.58	1.313	0.1	86.7
570.1	570	686.18	571	685.27	273.70	0.30%	10	0.011	0.026	0.950	0.20	0.965	2.7	24.1
571.1	571	685.27	572	673.17	399.10	3.00%	10	0.011	0.027	1.070	0.07	2.914	0.9	8.6
572.1	572	673.17	575	672.20	292.50	0.30%	12	0.011	0.035	0.880	0.23	1.567	2.2	22.9
573.1	573	685.55	585	676.19	249.20	3.80%	8	0.011	0.001	0.530	0.67	1.789	0.0	100.0
574.1	574	687.92	575	672.20	400.80	3.90%	8	0.011	0.003	0.580	0.01	1.828	0.2	1.5
575.1	575	672.20	576	671.12	324.30	0.30%	12	0.011	0.041	0.960	0.14	1.570	2.6	13.8
576.1	576	671.12	577	670.17	290.00	0.30%	12	0.011	0.043	0.980	0.24	1.557	2.8	23.6
577.1	577	670.17	583	668.60	375.70	0.40%	12	0.011	0.072	1.410	0.27	1.759	4.1	27.0
578.1	578	684.24	577	670.17	453.50	3.10%	8	0.011	0.019	0.900	0.67	1.626	1.2	100.0
579.1	579	685.77	578	684.24	287.80	0.50%	8	0.011	0.017	0.990	0.22	0.673	2.5	33.7
580.1	580	692.25	579	685.77	239.20	2.70%	8	0.011	0.016	0.890	0.05	1.519	1.0	7.9
581.1	581	697.07	580	692.25	376.30	1.30%	8	0.011	0.015	0.830	0.39	1.045	1.4	58.1
582.1	582	701.58	569	695.94	404.00	1.40%	8	0.011	0.000	0.320	0.00	1.091	0.0	0.4
583.1	583	668.60	584	667.30	296.90	0.40%	12	0.011	0.081	1.500	0.29	1.801	4.5	29.3
584.1	584	667.30	679	662.00	310.40	1.70%	12	0.011	0.082	1.720	0.12	3.556	2.3	11.7
585.1	585	676.19	568	674.85	247.80	0.50%	8	0.011	0.002	0.540	0.14	0.679	0.3	20.9
586.1	586	651.40	587	649.80	285.00	0.60%	8	0.011	0.288	2.770	0.47	0.692	41.6	70.9
587.1	587	649.80	606	648.89	162.90	0.60%	10	0.011	0.412	3.050	0.34	1.251	32.9	40.7
588.1	588	654.12	586	651.40	396.40	0.70%	8	0.011	0.271	2.920	0.48	0.765	35.5	72.2
589.1	589	655.35	588	654.12	233.00	0.50%	8	0.011	0.252	2.580	0.30	0.671	37.5	44.6
590.1	590	656.64	589	655.35	239.00	0.50%	8	0.011	0.243	2.570	0.29	0.678	35.8	43.6
591.1	591	658.24	590	656.64	303.10	0.50%	8	0.011	0.232	2.520	0.28	0.671	34.5	42.7
592.1	592	659.77	591	658.24	284.90	0.50%	8	0.011	0.140	2.140	0.37	0.676	20.6	56.0
593.1	593	661.30	592	659.77	284.10	0.50%	8	0.011	0.022	0.870	0.19	0.677	3.2	29.0
594.1	594	662.78	593	661.30	257.00	0.60%	8	0.011	0.011	0.850	0.20	0.700	1.6	30.3
595.1	595	662.68	594	662.78	257.00	0.00%	8	0.011	0.003	0.040	0.22	0.182	1.4	32.8
596.1	596	673.56	597	668.10	258.60	2.10%	8	0.011	0.003	0.600	0.56	1.341	0.2	84.2
597.1	597	668.10	592	659.77	257.30	3.20%	8	0.011	0.019	0.700	0.67	1.661	1.1	100.0
598.1	598	663.04	592	659.77	285.50	1.10%	8	0.011	0.073	1.770	0.47	0.988	7.4	70.1
599.1	599	668.76	598	663.04	277.70	2.10%	8	0.011	0.035	1.250	0.67	1.325	2.7	100.0
600.1	600	673.58	599	668.76	235.80	2.00%	8	0.011	0.002	0.540	0.01	1.320	0.1	0.8

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
601.1	601	671.23	602	662.49	479.20	1.80%	8	0.011	0.018	0.970	0.55	1.246	1.5	82.6
602.1	602	662.49	603	658.97	338.00	1.00%	8	0.011	0.029	1.230	0.10	0.942	3.1	15.3
603.1	603	658.97	587	649.80	437.00	2.10%	8	0.011	0.045	0.920	0.18	1.337	3.4	26.8
604.1	604	662.00	605	658.00	391.70	1.00%	8	0.011	0.005	0.620	0.30	0.933	0.5	45.3
605.1	605	658.00	587	649.80	288.40	2.80%	8	0.011	0.019	0.920	0.67	1.556	1.2	100.0
606.1	606	648.89	2477	648.54	67.60	0.50%	10	0.011	0.414	2.950	0.35	1.204	34.4	41.9
607.1	607	658.23	588	654.12	322.90	1.30%	8	0.011	0.003	0.560	0.01	1.041	0.3	0.9
608.1	608	654.27	610	653.64	105.50	0.60%	8	0.011	0.000	0.000	0.00	0.713	0.0	0.0
609.1	609	654.23	610	653.64	146.40	0.40%	8	0.011	0.007	0.740	0.04	0.586	1.2	5.6
610.1	610	653.64	611	647.34	173.30	3.60%	8	0.011	0.017	0.920	0.06	1.760	1.0	8.5
611.1	611	647.34	612	645.22	321.30	0.70%	10	0.011	0.596	3.630	0.39	1.359	43.8	47.3
612.1	612	645.22	613	644.19	267.50	0.40%	10	0.011	0.599	2.970	0.57	1.039	57.7	68.1
613.1	613	644.19	614	642.87	243.90	0.50%	10	0.011	0.604	3.380	0.42	1.231	49.0	50.6
614.1	614	642.87	615	626.15	420.10	4.00%	10	0.011	0.611	6.460	0.25	3.338	18.3	29.5
615.1	615	626.15	616	609.06	499.40	3.40%	10	0.011	0.615	6.170	0.18	3.096	19.9	22.0
616.1	616	609.06	617	606.98	366.20	0.60%	12	0.011	1.001	3.950	0.65	2.051	48.8	64.8
617.1	617	606.98	618	606.12	152.80	0.60%	15	0.011	1.014	3.910	0.45	3.701	27.4	36.2
618.1	618	606.12	632	605.11	181.30	0.60%	15	0.011	1.071	3.960	0.47	3.683	29.1	37.3
619.1	619	607.40	618	606.12	121.30	1.10%	8	0.011	0.010	0.760	0.04	0.948	1.1	5.3
620.1	620	608.50	619	607.40	196.30	0.60%	8	0.011	0.003	0.630	0.02	0.691	0.4	3.3
621.1	621	608.25	622	605.68	493.70	0.50%	8	0.011	0.004	0.630	0.16	0.666	0.6	24.5
622.1	622	605.68	625	603.33	449.10	0.50%	8	0.011	0.022	1.050	0.23	0.668	3.3	34.3
623.1	623	608.00	629	600.64	205.00	3.60%	8	0.011	0.009	0.690	0.02	1.749	0.5	3.7
624.1	624	604.55	629	600.64	282.50	1.40%	8	0.011	0.005	0.570	0.40	1.086	0.4	59.7
625.1	625	603.33	626	602.58	129.60	0.60%	8	0.011	0.035	1.150	0.13	0.702	5.0	19.3
626.1	626	602.58	627	601.22	250.00	0.50%	8	0.011	0.038	1.180	0.27	0.681	5.6	40.4
627.1	627	601.22	628	599.04	269.80	0.80%	8	0.011	0.044	1.440	0.35	0.830	5.2	51.9
628.1	628	599.04	640	597.56	348.10	0.40%	18	0.011	1.218	3.680	0.60	5.232	23.3	40.2
629.1	629	600.64	628	599.04	299.70	0.50%	18	0.011	1.168	3.950	0.46	5.862	19.9	30.6
630.1	630	602.24	629	600.64	299.00	0.50%	18	0.011	1.131	3.910	0.45	5.869	19.3	30.1
631.1	631	611.50	630	602.24	379.50	2.40%	8	0.011	0.003	0.580	0.67	1.442	0.2	100.0
632.1	632	605.11	633	603.99	204.20	0.50%	15	0.011	1.077	3.950	0.47	3.654	29.5	37.6
633.1	633	603.99	630	602.24	299.60	0.60%	15	0.011	1.108	4.070	0.47	3.771	29.4	37.5
634.1	634	613.00	636	611.55	268.40	0.50%	8	0.011	0.252	2.610	0.44	0.678	37.1	66.0
635.1	635	614.35	634	613.00	250.30	0.50%	8	0.011	0.245	2.590	0.43	0.678	36.1	63.9
636.1	636	611.55	638	609.84	322.60	0.50%	8	0.011	0.278	2.680	0.31	0.672	41.4	46.9
637.1	637	613.00	636	611.55	123.50	1.20%	8	0.011	0.010	0.270	0.14	1.000	1.0	21.5
638.1	638	609.84	640	597.56	168.70	7.30%	8	0.011	0.297	3.600	0.16	2.490	11.9	24.2
639.1	639	610.52	638	609.84	115.60	0.60%	8	0.011	0.007	0.800	0.05	0.708	1.0	7.3
640.1	640	597.56	641	596.65	200.50	0.50%	18	0.011	1.529	4.020	0.55	5.405	28.3	36.7

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
641.1	641	596.65	2091	593.90	286.60	1.00%	18	0.011	1.531	2.410	1.09	7.859	19.5	72.8
642.1	642	615.06	635	614.35	336.60	0.20%	8	0.011	0.002	0.450	0.03	0.424	0.5	5.0
643.1	643	615.44	644	611.33	268.10	1.50%	8	0.011	0.002	0.550	0.42	1.143	0.2	62.5
644.1	644	611.33	633	603.99	321.60	2.30%	8	0.011	0.013	0.810	0.04	1.394	0.9	6.2
645.1	645	611.49	618	606.12	339.70	1.60%	8	0.011	0.031	1.240	0.10	1.160	2.7	14.8
646.1	646	617.88	645	611.49	251.50	2.50%	8	0.011	0.022	1.010	0.67	1.471	1.5	100.0
647.1	647	620.79	646	617.88	280.60	1.00%	8	0.011	0.009	0.740	0.32	0.940	1.0	48.7
648.1	648	627.36	649	624.45	224.10	1.30%	8	0.011	0.115	2.200	0.16	1.052	11.0	24.4
649.1	649	624.45	653	621.44	165.20	1.80%	8	0.011	0.124	2.230	0.15	1.246	9.9	23.1
650.1	650	634.98	648	627.36	294.00	2.60%	8	0.011	0.011	0.730	0.67	1.486	0.7	100.0
651.1	651	635.99	650	634.98	203.60	0.50%	8	0.011	0.003	0.610	0.02	0.650	0.4	2.7
652.1	652	616.49	616	609.06	286.90	2.60%	8	0.011	0.143	2.360	0.67	1.485	9.6	100.0
653.1	653	621.44	652	616.49	179.50	2.80%	8	0.011	0.136	2.270	0.14	1.533	8.9	21.6
654.1	654	624.96	653	621.44	138.30	2.50%	8	0.011	0.006	0.630	0.02	1.472	0.4	2.7
655.1	655	615.96	656	613.60	226.10	1.00%	15	0.011	0.000	0.000	0.00	5.041	0.0	0.0
656.1	656	613.60	657	610.74	265.70	1.10%	15	0.011	0.000	0.000	0.29	5.119	0.0	22.9
657.1	657	610.74	658	608.25	238.00	1.00%	15	0.011	0.000	0.000	0.00	5.046	0.0	0.0
658.1	658	608.25	659	607.66	98.40	0.60%	15	0.011	0.000	0.000	0.00	3.820	0.0	0.0
659.1	659	607.66	617	606.98	165.10	0.40%	15	0.011	0.000	0.000	0.13	3.166	0.0	10.7
660.1	660	617.81	661	617.24	109.50	0.50%	8	0.011	0.051	1.310	0.15	0.666	7.7	22.9
661.1	661	617.24	635	614.35	296.70	1.00%	8	0.011	0.211	3.050	0.52	0.911	23.1	77.9
662.1	662	618.22	661	617.24	167.90	0.60%	8	0.011	0.005	0.180	0.12	0.705	0.8	18.7
663.1	663	619.13	662	618.22	162.80	0.60%	8	0.011	0.002	0.540	0.00	0.690	0.2	0.7
664.1	664	622.20	665	615.16	274.50	2.60%	10	0.012	0.151	2.420	0.83	2.457	6.1	100.0
665.1	665	615.16	666	609.06	299.50	2.00%	10	0.011	0.184	2.750	0.17	2.388	7.7	20.0
666.1	666	609.06	667	607.30	159.90	1.10%	10	0.011	0.194	2.990	0.20	1.755	11.0	23.7
667.1	667	607.30	2085	597.00	172.20	6.00%	10	0.011	0.409	4.580	0.18	4.093	10.0	21.8
668.1	668	619.09	665	615.16	382.90	1.00%	8	0.011	0.014	0.850	0.33	0.935	1.5	49.3
669.1	669	608.80	667	607.30	281.50	0.50%	10	0.012	0.200	2.230	0.40	1.120	17.9	48.2
670.1	670	611.31	669	608.80	483.20	0.50%	10	0.012	0.181	2.120	0.38	1.106	16.3	45.8
671.1	671	621.91	670	611.31	297.20	3.60%	10	0.011	0.173	2.540	0.83	3.161	5.5	100.0
672.1	672	622.04	668	619.09	286.20	1.00%	8	0.011	0.003	0.560	0.30	0.937	0.4	45.3
673.1	673	623.28	671	621.91	255.30	0.50%	10	0.011	0.163	2.220	0.36	1.226	13.3	42.6
674.1	674	632.99	673	623.28	293.50	3.30%	10	0.011	0.154	2.380	0.83	3.044	5.1	100.0
675.1	675	633.86	674	632.99	162.20	0.50%	10	0.011	0.143	2.070	0.21	1.226	11.6	24.9
676.1	676	639.02	674	632.99	239.30	2.50%	8	0.011	0.001	0.530	0.00	1.465	0.1	0.7
677.1	677	635.70	678	634.57	233.90	0.50%	8	0.012	0.042	1.140	0.15	0.588	7.2	22.1
678.1	678	634.57	664	622.20	342.00	3.60%	8	0.011	0.042	1.270	0.09	1.755	2.4	13.2
679.1	679	662.00	681	653.53	195.80	4.30%	12	0.011	0.082	1.590	0.09	5.661	1.4	9.3
680.1	680	657.56	681	653.53	56.30	7.20%	6	0.011	0.000	0.000	0.00	1.147	0.0	0.0

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
681.1	681	653.53	2392	653.33	93.70	0.20%	15	0.011	0.082	1.150	0.18	2.279	3.6	14.5
682.1	682	652.54	687	651.89	257.20	0.30%	15	0.011	0.100	1.320	0.25	2.480	4.0	20.3
683.1	683	654.81	682	652.54	280.90	0.80%	8	0.011	0.014	0.890	0.28	0.830	1.7	42.6
684.1	684	656.07	683	654.81	221.50	0.60%	8	0.011	0.013	0.880	0.06	0.696	1.9	8.3
685.1	685	656.46	684	656.07	93.90	0.40%	8	0.011	0.000	0.000	0.00	0.595	0.0	0.0
686.1	686	670.50	687	651.89	350.30	5.30%	8	0.011	0.001	0.530	0.67	2.127	0.1	100.0
687.1	687	651.89	688	651.18	281.50	0.30%	15	0.011	0.103	1.340	0.26	2.478	4.2	21.0
688.1	688	651.18	699	650.24	382.40	0.20%	15	0.011	0.107	1.350	0.26	2.446	4.4	21.0
689.1	689	667.63	688	651.18	322.10	5.10%	8	0.011	0.001	0.530	0.00	2.086	0.1	0.7
690.1	690	671.61	689	667.63	302.30	1.30%	8	0.011	0.000	0.000	0.00	1.059	0.0	0.0
691.1	691	668.35	692	660.28	403.10	2.00%	8	0.011	0.000	0.210	0.00	1.306	0.0	0.4
692.1	692	660.28	694	647.40	309.00	4.20%	8	0.011	0.003	0.570	0.01	1.884	0.1	1.5
693.1	693	664.17	692	660.28	193.80	2.00%	8	0.011	0.001	0.530	0.00	1.308	0.1	0.6
694.1	694	647.40	1430	635.30	166.80	7.30%	15	0.011	0.121	1.890	0.09	13.287	0.9	7.2
695.1	695	648.37	694	647.40	401.40	0.20%	15	0.011	0.116	1.390	0.20	2.425	4.8	16.3
697.1	697	648.93	695	648.37	226.50	0.20%	15	0.011	0.115	1.400	0.20	2.453	4.7	16.0
698.1	698	649.80	697	648.93	336.70	0.30%	15	0.011	0.113	1.400	0.20	2.508	4.5	15.8
699.1	699	650.24	698	649.80	158.80	0.30%	15	0.011	0.110	1.430	0.19	2.597	4.2	15.3
700.1	700	666.01	698	649.80	279.00	5.80%	8	0.011	0.001	0.520	0.67	2.225	0.0	100.0
701.1	701	681.32	706	666.65	291.60	5.00%	8	0.011	0.000	0.000	0.67	2.070	0.0	100.0
702.1	702	670.12	706	666.65	142.90	2.40%	8	0.011	0.002	0.550	0.01	1.438	0.1	0.9
703.1	703	670.74	702	670.12	31.80	1.90%	8	0.011	0.002	0.570	0.01	1.288	0.2	1.5
704.1	704	674.47	703	670.74	195.10	1.90%	8	0.011	0.002	0.560	0.01	1.276	0.2	1.4
705.1	705	677.35	704	674.47	274.50	1.00%	8	0.011	0.000	0.460	0.29	0.945	0.0	43.7
706.1	706	666.65	707	661.90	143.70	3.30%	8	0.011	0.003	0.570	0.01	1.678	0.2	1.4
707.1	707	661.90	708	655.95	166.50	3.60%	8	0.011	0.008	0.660	0.02	1.745	0.4	3.1
708.1	708	655.95	709	654.89	164.30	0.60%	8	0.011	0.008	0.720	0.03	0.741	1.0	4.9
709.1	709	654.89	710	651.84	499.00	0.60%	8	0.011	0.008	0.320	0.11	0.722	1.1	16.3
710.1	710	651.84	2193	641.20	352.80	3.00%	18	0.011	2.434	7.280	1.26	13.933	17.5	84.1
711.1	711	669.76	707	661.90	110.80	7.10%	8	0.011	0.004	0.580	0.01	2.458	0.1	1.6
712.1	712	679.63	711	669.76	221.80	4.40%	8	0.011	0.000	0.520	0.00	1.947	0.0	0.5
713.1	713	684.14	712	679.63	98.70	4.60%	8	0.011	0.000	0.000	0.00	1.973	0.0	0.0
714.1	714	671.22	711	669.76	172.60	0.80%	8	0.011	0.002	0.550	0.01	0.849	0.3	1.1
715.1	715	676.49	714	671.22	205.90	2.60%	8	0.011	0.001	0.530	0.00	1.477	0.1	0.7
716.1	716	686.74	2428	683.66	103.70	3.00%	8	0.011	0.001	0.520	0.00	1.591	0.0	0.6
717.1	717	677.05	715	676.49	78.10	0.70%	8	0.011	0.000	0.000	0.00	0.782	0.0	0.0
718.1	718	675.22	723	675.25	249.10	0.00%	8	0.011	0.000	0.000	0.19	0.101	0.0	28.4
719.1	719	677.57	720	670.58	504.40	1.40%	8	0.011	0.000	0.320	0.00	1.087	0.0	0.4
720.1	720	670.58	721	664.53	281.50	2.10%	8	0.011	0.002	0.590	0.62	1.353	0.2	92.9
721.1	721	664.53	724	662.82	142.90	1.20%	8	0.011	0.012	0.780	0.04	1.010	1.2	5.6

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
722.1	722	664.87	721	664.53	17.20	2.00%	8	0.011	0.001	0.530	0.00	1.297	0.1	0.7
723.1	723	675.25	722	664.87	267.20	3.90%	8	0.011	0.001	0.530	0.67	1.819	0.1	100.0
724.1	724	662.82	725	662.82	38.40	0.00%	8	0.011	0.012	0.320	0.15	0.000	Infinity	22.1
725.1	725	662.82	684	656.07	142.10	4.80%	8	0.011	0.012	0.750	0.03	2.012	0.6	4.7
726.1	726	667.84	721	664.53	294.50	1.10%	8	0.011	0.006	0.640	0.35	0.978	0.7	52.4
727.1	727	676.28	726	667.84	277.60	3.00%	8	0.011	0.001	0.530	0.67	1.609	0.1	100.0
728.1	728	672.68	726	667.84	288.90	1.70%	8	0.011	0.004	0.590	0.50	1.195	0.3	74.3
729.1	729	674.86	728	672.68	65.00	3.40%	8	0.011	0.002	0.540	0.01	1.690	0.1	0.8
730.1	730	679.37	729	674.86	465.90	1.00%	8	0.011	0.002	0.540	0.26	0.908	0.2	38.4
731.1	731	681.89	730	679.37	259.60	1.00%	8	0.011	0.001	0.530	0.26	0.909	0.1	38.5
732.1	732	684.52	733	683.34	70.90	1.70%	8	0.011	0.000	0.320	0.00	1.191	0.0	0.4
733.1	733	683.34	731	681.89	164.70	0.90%	8	0.011	0.001	0.520	0.00	0.866	0.1	0.6
734.1	734	682.21	735	676.92	278.90	1.90%	8	0.011	0.000	0.000	0.53	1.271	0.0	79.3
735.1	735	676.92	736	661.72	297.50	5.10%	8	0.011	0.001	0.530	0.67	2.086	0.1	100.0
736.1	736	661.72	737	660.18	113.70	1.40%	8	0.011	0.002	0.540	0.01	1.074	0.2	0.8
737.1	737	660.18	739	639.16	309.10	6.80%	8	0.011	0.003	0.600	0.01	2.407	0.1	2.2
738.1	738	660.63	737	660.18	77.90	0.60%	8	0.011	0.001	0.530	0.00	0.702	0.1	0.6
739.1	739	639.16	1990	637.51	452.70	0.40%	18	0.011	2.425	4.210	0.85	4.844	50.1	56.4
740.1	740	663.05	741	661.92	196.30	0.60%	8	0.011	0.000	0.000	0.00	0.700	0.0	0.0
741.1	741	661.92	742	660.61	168.20	0.80%	8	0.011	0.001	0.530	0.00	0.815	0.1	0.6
742.1	742	660.61	745	659.50	191.80	0.60%	8	0.011	0.004	0.630	0.02	0.702	0.6	2.8
743.1	743	663.21	742	660.61	150.40	1.70%	8	0.011	0.003	0.630	0.02	1.213	0.2	3.2
744.1	744	664.58	743	663.21	227.40	0.60%	8	0.011	0.002	0.560	0.01	0.716	0.3	1.4
745.1	745	659.50	747	658.45	173.20	0.60%	8	0.011	0.005	0.640	0.02	0.719	0.6	3.1
746.1	746	665.17	744	664.58	176.00	0.30%	8	0.011	0.001	0.530	0.00	0.534	0.2	0.7
747.1	747	658.45	752	657.12	294.30	0.50%	8	0.011	0.005	0.710	0.17	0.621	0.8	25.1
748.1	748	667.11	746	665.17	225.40	0.90%	8	0.011	0.000	0.210	0.00	0.856	0.0	0.4
749.1	749	668.81	751	668.19	91.60	0.70%	8	0.011	0.000	0.210	0.00	0.759	0.0	0.4
750.1	750	672.30	751	668.19	82.20	5.00%	8	0.011	0.000	0.000	0.00	2.064	0.0	0.0
751.1	751	668.19	752	657.12	281.20	3.90%	8	0.011	0.001	0.520	0.67	1.831	0.0	100.0
752.1	752	657.12	753	654.86	363.60	0.60%	8	0.011	0.007	0.720	0.19	0.728	1.0	29.0
753.1	753	654.86	754	635.46	160.70	12.10%	8	0.011	0.009	0.660	0.02	3.207	0.3	2.6
754.1	754	635.46	1430	635.30	134.70	0.10%	18	0.011	2.420	3.570	0.86	2.766	87.5	57.4
755.1	755	702.00	764	700.75	293.20	0.40%	8	0.011	0.004	0.680	0.15	0.603	0.7	23.1
756.1	756	711.10	755	702.00	350.30	2.60%	8	0.011	0.003	0.560	0.66	1.488	0.2	98.7
757.1	757	715.39	756	711.10	359.10	1.20%	8	0.011	0.001	0.530	0.31	1.009	0.1	46.7
758.1	758	716.81	757	715.39	254.60	0.60%	8	0.011	0.000	0.520	0.15	0.689	0.1	21.8
759.1	759	718.80	760	716.79	377.50	0.50%	8	0.011	0.000	0.000	0.14	0.674	0.0	21.5
760.1	760	716.79	767	713.64	380.40	0.80%	8	0.011	0.001	0.530	0.23	0.840	0.1	34.4
761.1	761	717.08	762	714.04	301.00	1.00%	8	0.011	0.000	0.520	0.00	0.928	0.0	0.5

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
762.1	762	714.04	763	707.04	362.40	1.90%	8	0.011	0.002	0.540	0.50	1.283	0.1	75.7
763.1	763	707.04	764	700.75	327.90	1.90%	8	0.011	0.003	0.590	0.01	1.278	0.2	2.1
764.1	764	700.75	581	697.07	289.60	1.30%	8	0.011	0.009	0.700	0.39	1.041	0.9	59.0
765.1	765	701.77	581	697.07	385.70	1.20%	8	0.011	0.004	0.580	0.35	1.019	0.4	51.9
766.1	766	707.61	765	701.77	386.50	1.50%	8	0.011	0.003	0.610	0.43	1.135	0.3	65.0
767.1	767	713.64	766	707.61	387.10	1.60%	8	0.011	0.002	0.590	0.45	1.152	0.2	66.9
768.1	768	700.63	578	684.24	457.60	3.60%	8	0.011	0.001	0.520	0.67	1.747	0.0	100.0
769.1	769	670.11	770	666.48	159.80	2.30%	8	0.012	0.009	0.770	0.04	1.275	0.7	6.0
770.1	770	666.48	771	662.54	468.30	0.80%	8	0.012	0.016	0.980	0.29	0.776	2.1	43.4
771.1	771	662.54	772	657.74	479.60	1.00%	8	0.012	0.034	1.270	0.38	0.846	4.0	57.6
772.1	772	657.74	773	650.65	415.70	1.70%	8	0.012	0.052	1.480	0.12	1.105	4.7	17.4
773.1	773	650.65	382	649.00	329.60	0.50%	8	0.012	0.183	2.150	0.27	0.599	30.6	40.3
774.1	774	652.00	773	650.65	289.20	0.50%	8	0.012	0.111	1.720	0.35	0.578	19.2	53.0
775.1	775	656.99	774	652.00	414.30	1.20%	8	0.012	0.035	1.320	0.11	0.929	3.7	16.7
776.1	776	661.79	775	656.99	479.70	1.00%	8	0.012	0.018	1.000	0.34	0.846	2.1	50.7
777.1	777	667.76	776	661.79	401.70	1.50%	8	0.012	0.005	0.620	0.02	1.031	0.5	2.3
778.1	778	666.43	779	659.49	456.40	1.50%	8	0.012	0.009	0.700	0.41	1.043	0.9	61.8
779.1	779	659.49	780	656.45	418.60	0.70%	8	0.012	0.023	1.150	0.09	0.721	3.1	14.1
780.1	780	656.45	781	653.55	400.10	0.70%	8	0.012	0.039	1.230	0.13	0.720	5.3	19.6
781.1	781	653.55	774	652.00	291.00	0.50%	8	0.012	0.059	1.370	0.32	0.618	9.6	47.8
782.1	782	685.50	783	684.50	93.40	1.10%	8	0.011	0.000	0.000	0.00	0.955	0.0	0.0
783.1	783	684.50	784	682.72	120.70	1.50%	8	0.011	0.006	0.630	0.02	1.121	0.5	2.5
784.1	784	682.72	786	680.74	102.70	1.90%	8	0.011	0.006	0.700	0.03	1.282	0.5	4.7
785.1	785	686.12	798	681.59	297.20	1.50%	8	0.011	0.004	0.600	0.47	1.139	0.4	69.8
786.1	786	680.74	787	678.24	123.50	2.00%	8	0.011	0.010	0.780	0.04	1.313	0.7	6.1
787.1	787	678.24	788	675.64	264.90	1.00%	8	0.011	0.014	0.860	0.31	0.914	1.5	46.7
788.1	788	675.64	789	675.08	115.10	0.50%	8	0.011	0.023	0.980	0.11	0.644	3.6	16.2
789.1	789	675.08	790	673.67	123.20	1.10%	8	0.011	0.028	1.150	0.09	0.987	2.8	13.2
790.1	790	673.67	791	671.84	122.70	1.50%	8	0.011	0.031	1.220	0.10	1.127	2.7	14.4
791.1	791	671.84	808	669.86	397.10	0.50%	8	0.011	0.165	2.190	0.39	0.652	25.3	57.9
792.1	792	672.30	791	671.84	99.70	0.50%	8	0.011	0.127	1.940	0.22	0.627	20.3	33.3
793.1	793	672.79	792	672.30	110.50	0.40%	8	0.011	0.124	1.890	0.22	0.615	20.2	33.3
794.1	794	676.00	793	672.79	76.50	4.20%	8	0.011	0.032	1.140	0.08	1.891	1.7	11.8
795.1	795	677.88	794	676.00	115.80	1.60%	8	0.011	0.029	1.180	0.09	1.176	2.4	13.7
796.1	796	679.43	795	677.88	103.40	1.50%	8	0.011	0.025	1.100	0.08	1.130	2.2	12.2
797.1	797	680.44	796	679.43	102.00	1.00%	8	0.011	0.021	1.030	0.07	0.918	2.3	11.0
798.1	798	681.59	797	680.44	114.70	1.00%	8	0.011	0.021	1.030	0.07	0.924	2.3	10.9
799.1	799	678.23	800	677.58	130.00	0.50%	8	0.011	0.020	1.020	0.10	0.653	3.1	14.4
800.1	800	677.58	801	677.08	99.80	0.50%	8	0.011	0.021	1.030	0.10	0.653	3.1	14.4
801.1	801	677.08	802	674.91	338.30	0.60%	8	0.011	0.029	1.060	0.12	0.739	4.0	18.1

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
802.1	802	674.91	803	673.20	81.20	2.10%	8	0.011	0.040	1.300	0.10	1.340	3.0	14.6
803.1	803	673.20	793	672.79	128.10	0.30%	8	0.011	0.090	1.470	0.21	0.522	17.2	31.5
804.1	804	677.19	805	676.49	151.40	0.50%	8	0.011	0.003	0.670	0.03	0.628	0.4	4.8
805.1	805	676.49	803	673.20	279.70	1.20%	8	0.011	0.038	1.350	0.44	1.001	3.8	65.9
806.1	806	679.99	805	676.49	456.60	0.80%	8	0.011	0.018	1.010	0.27	0.808	2.2	40.3
807.1	807	683.94	806	679.99	384.30	1.00%	8	0.011	0.005	0.630	0.30	0.936	0.6	44.9
808.1	808	669.86	809	665.97	369.20	1.10%	8	0.011	0.181	2.950	0.49	0.947	19.1	73.1
809.1	809	665.97	810	664.38	91.50	1.70%	8	0.011	0.195	2.960	0.19	1.217	16.0	28.6
810.1	810	664.38	811	663.27	110.70	1.00%	8	0.011	0.199	3.020	0.22	0.924	21.5	33.3
811.1	811	663.27	812	660.55	274.80	1.00%	8	0.011	0.203	3.030	0.50	0.918	22.1	74.6
812.1	812	660.55	814	659.95	121.10	0.50%	8	0.011	0.220	2.420	0.28	0.650	33.9	42.4
813.1	813	663.79	812	660.55	162.40	2.00%	8	0.011	0.007	0.720	0.03	1.304	0.5	5.1
814.1	814	659.95	815	659.09	169.50	0.50%	8	0.011	0.224	2.450	0.28	0.658	34.0	42.4
815.1	815	659.09	817	657.69	282.40	0.50%	8	0.011	0.238	2.490	0.43	0.650	36.7	65.1
816.1	816	664.15	815	659.09	253.30	2.00%	8	0.011	0.002	0.590	0.52	1.304	0.2	78.0
817.1	817	657.69	818	657.00	91.50	0.80%	8	0.011	0.256	2.970	0.27	0.801	31.9	40.7
818.1	818	657.00	838	648.61	307.60	2.70%	8	0.011	0.256	3.440	0.19	1.524	16.8	28.9
819.1	819	661.87	817	657.69	209.30	2.00%	8	0.011	0.007	0.730	0.03	1.304	0.5	5.2
820.1	820	675.41	821	671.56	125.40	3.10%	8	0.011	0.000	0.000	0.00	1.617	0.0	0.0
821.1	821	671.56	849	671.02	109.70	0.50%	8	0.011	0.006	0.710	0.03	0.648	0.9	4.9
822.1	822	668.36	823	665.51	123.20	2.30%	8	0.011	0.000	0.000	0.00	1.404	0.0	0.0
823.1	823	665.51	824	662.97	121.50	2.10%	8	0.011	0.005	0.680	0.03	1.335	0.4	4.3
824.1	824	662.97	827	661.80	142.50	0.80%	8	0.011	0.015	0.910	0.06	0.836	1.8	8.7
825.1	825	663.72	824	662.97	197.40	0.40%	8	0.011	0.000	0.000	0.00	0.569	0.0	0.0
826.1	826	664.09	825	663.72	80.60	0.50%	8	0.011	0.000	0.000	0.00	0.625	0.0	0.0
827.1	827	661.80	828	661.14	171.50	0.40%	8	0.011	0.020	0.970	0.10	0.573	3.4	14.4
828.1	828	661.14	829	660.12	279.40	0.40%	8	0.011	0.027	0.830	0.23	0.558	4.8	35.2
829.1	829	660.12	830	658.99	309.60	0.40%	8	0.011	0.037	1.000	0.15	0.558	6.7	22.3
830.1	830	658.99	831	658.14	226.10	0.40%	8	0.011	0.049	1.180	0.16	0.566	8.6	23.8
831.1	831	658.14	832	657.46	176.30	0.40%	8	0.011	0.059	1.310	0.17	0.573	10.3	25.4
832.1	832	657.46	833	656.81	166.30	0.40%	8	0.011	0.066	1.380	0.18	0.577	11.4	26.3
833.1	833	656.81	834	656.04	204.20	0.40%	8	0.011	0.076	1.460	0.19	0.567	13.3	28.0
834.1	834	656.04	835	655.26	204.70	0.40%	8	0.011	0.082	1.520	0.19	0.570	14.4	28.9
835.1	835	655.26	836	654.79	113.30	0.40%	8	0.011	0.171	2.080	0.26	0.594	28.7	39.2
836.1	836	654.79	837	654.26	132.10	0.40%	8	0.011	0.174	2.070	0.27	0.585	29.8	40.0
837.1	837	654.26	838	648.61	399.20	1.40%	8	0.011	0.179	2.850	0.19	1.098	16.3	29.0
838.1	838	648.61	839	647.00	67.10	2.40%	8	0.011	0.454	5.340	0.26	1.430	31.8	39.7
839.1	839	647.00	840	636.26	33.90	31.60%	8	0.011	0.455	4.710	0.14	5.192	8.8	20.8
840.1	840	636.26	2275	633.79	735.40	0.30%	24	0.011	11.478	5.690	1.95	10.014	114.6	97.3
841.1	841	660.67	835	655.26	154.30	3.50%	8	0.011	0.078	1.640	0.11	1.728	4.5	16.1

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
842.1	842	661.76	841	660.67	244.90	0.40%	8	0.011	0.069	1.470	0.17	0.616	11.2	26.1
843.1	843	662.37	842	661.76	131.40	0.50%	8	0.011	0.064	1.440	0.17	0.629	10.2	25.1
844.1	844	666.07	843	662.37	400.40	0.90%	8	0.011	0.049	1.510	0.13	0.887	5.5	19.1
845.1	845	666.64	844	666.07	115.40	0.50%	8	0.011	0.045	1.230	0.15	0.649	6.9	21.8
846.1	846	667.16	845	666.64	106.10	0.50%	8	0.011	0.041	1.170	0.14	0.646	6.4	21.2
847.1	847	668.81	846	667.16	387.10	0.40%	8	0.011	0.026	0.940	0.24	0.603	4.3	35.7
848.1	848	669.67	847	668.81	188.10	0.50%	8	0.011	0.020	1.000	0.09	0.624	3.1	14.1
849.1	849	671.02	848	669.67	313.20	0.40%	8	0.011	0.009	0.820	0.05	0.606	1.4	7.4
850.1	850	657.16	851	655.60	106.80	1.50%	8	0.011	0.000	0.000	0.00	1.116	0.0	0.0
851.1	851	655.60	852	649.96	430.20	1.30%	8	0.011	0.028	1.140	0.08	1.057	2.7	12.7
852.1	852	649.96	853	646.25	312.70	1.20%	8	0.011	0.091	1.970	0.15	1.005	9.1	22.8
853.1	853	646.25	854	631.31	229.40	6.50%	8	0.011	0.107	1.850	0.10	2.356	4.5	15.7
854.1	854	631.31	1984	631.31	266.20	0.00%	24	0.011	11.564	5.700	2.00	0.000	Infinity	100.0
855.1	855	659.81	859	658.62	143.00	0.80%	8	0.011	0.003	0.580	0.01	0.842	0.4	1.6
856.1	856	659.80	857	656.37	359.30	1.00%	8	0.011	0.012	0.810	0.29	0.902	1.3	43.2
857.1	857	656.37	858	653.48	444.60	0.70%	8	0.011	0.026	1.140	0.10	0.744	3.5	15.7
858.1	858	653.48	852	649.96	252.50	1.40%	8	0.011	0.042	1.390	0.46	1.090	3.9	69.6
859.1	859	658.62	851	655.60	359.80	0.80%	8	0.011	0.010	0.760	0.25	0.846	1.1	38.0
860.1	860	665.00	433	661.23	221.90	1.70%	6	0.012	0.000	0.000	0.00	0.512	0.0	0.0
861.1	861	652.16	425	651.91	58.30	0.40%	8	0.012	0.663	2.940	0.67	0.554	119.6	100.0
862.1	862	661.88	875	647.93	155.20	9.00%	8	0.011	0.275	3.360	0.15	2.767	9.9	21.8
863.1	863	709.69	92	702.44	394.30	1.80%	8	0.011	0.166	2.640	0.67	1.252	13.2	100.0
864.1	864	709.95	865	704.17	292.50	2.00%	8	0.011	0.017	0.940	0.64	1.298	1.3	95.8
865.1	865	704.17	868	696.51	310.70	2.50%	8	0.011	0.033	1.200	0.09	1.449	2.3	13.5
866.1	866	707.14	867	705.78	327.40	0.40%	8	0.011	0.011	0.910	0.06	0.595	1.9	9.6
867.1	867	705.78	868	696.51	199.30	4.70%	8	0.011	0.023	1.020	0.07	1.990	1.2	10.1
868.1	868	696.51	872	678.90	301.10	5.80%	8	0.011	0.056	1.360	0.09	2.232	2.5	12.9
869.1	869	676.61	LS_KT	668.00	14.00	61.30%	8	0.011	0.189	2.430	0.09	7.229	2.6	14.1
870.1	870	677.22	869	676.61	108.90	0.60%	8	0.011	0.189	2.400	0.25	0.691	27.4	38.0
871.1	871	678.15	870	677.22	206.50	0.50%	8	0.011	0.162	2.100	0.25	0.619	26.1	37.4
872.1	872	678.90	871	678.15	164.30	0.50%	8	0.011	0.153	2.070	0.24	0.624	24.5	36.3
873.1	873	680.20	872	678.90	299.40	0.40%	8	0.011	0.084	1.590	0.19	0.608	13.8	28.3
874.1	874	681.90	873	680.20	298.30	0.60%	8	0.011	0.046	1.320	0.14	0.697	6.6	21.3
875.1	875	647.93	876	647.21	503.50	0.10%	27	0.011	2.633	3.110	0.82	8.945	29.4	36.4
876.1	876	647.21	95	646.34	511.00	0.20%	27	0.011	2.588	3.240	0.78	9.760	26.5	34.9
877.1	877	696.10	878	679.51	310.10	5.30%	8	0.011	0.000	0.000	0.00	2.135	0.0	0.0
878.1	878	679.51	879	666.00	313.50	4.30%	8	0.011	0.013	0.810	0.04	1.916	0.7	6.2
879.1	879	666.00	881	664.90	305.20	0.40%	8	0.011	0.029	0.850	0.14	0.554	5.2	20.7
880.1	880	688.60	881	664.90	440.70	5.40%	8	0.011	0.010	0.720	0.03	2.141	0.4	4.2
881.1	881	664.90	886	664.49	99.50	0.40%	8	0.011	0.057	1.310	0.16	0.593	9.6	24.7

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
882.1	882	666.00	886	664.49	129.20	1.20%	8	0.011	0.000	0.000	0.00	0.998	0.0	0.0
883.1	883	702.50	884	688.25	410.40	3.50%	8	0.011	0.000	0.000	0.00	1.720	0.0	0.0
884.1	884	688.25	885	666.90	411.50	5.20%	8	0.011	0.000	0.000	0.00	2.102	0.0	0.0
885.1	885	666.90	862	661.88	122.10	4.10%	8	0.011	0.011	0.740	0.03	1.871	0.6	4.6
886.1	886	664.49	1257	649.42	148.40	10.20%	8	0.011	0.057	1.320	0.08	2.941	1.9	11.4
887.1	887	705.39	888	704.90	78.40	0.60%	8	0.011	0.000	0.000	0.00	0.730	0.0	0.0
888.1	888	704.90	889	690.90	398.90	3.50%	8	0.011	0.006	0.630	0.02	1.729	0.3	2.5
889.1	889	690.90	890	683.00	216.20	3.70%	8	0.011	0.018	0.930	0.06	1.764	1.0	8.7
890.1	890	683.00	902	678.62	68.70	6.40%	8	0.011	0.025	1.030	0.07	2.330	1.1	10.3
891.1	891	705.45	892	703.45	131.00	1.50%	8	0.011	0.000	0.000	0.00	1.140	0.0	0.0
892.1	892	703.45	893	696.82	449.20	1.50%	8	0.011	0.007	0.610	0.38	1.121	0.6	57.1
893.1	893	696.82	894	690.90	91.70	6.50%	8	0.011	0.019	0.880	0.05	2.345	0.8	7.0
894.1	894	690.90	895	690.90	79.60	0.00%	8	0.011	0.023	0.440	0.19	0.000	Infinity	28.2
895.1	895	690.90	896	675.32	298.90	5.20%	8	0.011	0.025	0.980	0.06	2.107	1.2	8.6
896.1	896	675.32	897	659.25	309.70	5.20%	8	0.011	0.034	1.140	0.07	2.103	1.6	11.2
897.1	897	659.25	898	652.15	103.20	6.90%	8	0.011	0.045	1.240	0.08	2.421	1.9	11.6
898.1	898	652.15	80	651.67	188.00	0.30%	27	0.011	2.244	3.590	0.66	11.954	18.8	29.2
899.1	899	652.26	898	652.15	280.90	0.00%	27	0.011	2.199	2.510	0.85	4.681	47.0	37.9
900.1	900	654.09	899	652.26	98.10	1.90%	8	0.011	0.047	1.380	0.10	1.260	3.7	15.7
901.1	901	672.58	900	654.09	400.30	4.60%	8	0.011	0.033	1.140	0.08	1.984	1.7	11.6
902.1	902	678.62	901	672.58	182.30	3.30%	8	0.011	0.027	1.080	0.07	1.680	1.6	11.1
903.1	903	770.31	904	768.75	291.00	0.50%	8	0.011	0.092	1.810	0.34	0.676	13.6	51.1
904.1	904	768.75	905	767.62	206.50	0.50%	8	0.011	0.115	1.950	0.20	0.683	16.8	30.7
905.1	905	767.62	906	766.63	178.90	0.60%	8	0.011	0.121	2.000	0.21	0.687	17.6	31.2
906.1	906	766.63	907	766.40	76.60	0.30%	8	0.011	0.143	1.770	0.26	0.506	28.2	38.7
907.1	907	766.40	908	765.22	165.70	0.70%	8	0.011	0.146	2.380	0.21	0.779	18.7	31.5
908.1	908	765.22	909	763.94	237.30	0.50%	8	0.011	0.224	2.500	0.28	0.678	33.0	41.9
909.1	909	763.94	910	762.50	258.70	0.60%	8	0.011	0.260	2.630	0.44	0.689	37.7	66.7
910.1	910	762.50	1117	762.45	277.70	0.00%	8	0.011	0.292	1.340	0.62	0.124	235.6	92.7
911.1	911	770.93	912	769.77	210.30	0.60%	8	0.011	0.008	0.770	0.04	0.686	1.2	6.2
912.1	912	769.77	913	768.46	244.10	0.50%	8	0.011	0.015	0.960	0.07	0.676	2.2	10.5
913.1	913	768.46	910	762.50	131.30	4.50%	8	0.011	0.023	1.010	0.07	1.966	1.1	10.0
914.1	914	766.09	909	763.94	216.10	1.00%	8	0.011	0.028	1.190	0.09	0.921	3.1	14.0
915.1	915	768.26	914	766.09	416.20	0.50%	8	0.011	0.010	0.820	0.05	0.666	1.4	7.4
916.1	916	769.16	915	768.26	162.80	0.60%	8	0.011	0.003	0.580	0.01	0.686	0.4	1.7
917.1	917	771.28	908	765.22	154.50	3.90%	8	0.011	0.006	0.640	0.02	1.828	0.3	2.8
918.1	918	774.57	920	772.34	207.90	1.10%	8	0.011	0.007	0.670	0.02	0.956	0.7	3.5
919.1	919	774.63	920	772.34	218.30	1.00%	8	0.011	0.004	0.600	0.01	0.945	0.4	2.0
920.1	920	772.34	921	771.61	190.90	0.40%	8	0.011	0.022	0.980	0.10	0.571	3.9	15.6
921.1	921	771.61	922	771.18	65.80	0.70%	8	0.011	0.033	1.150	0.12	0.746	4.4	18.4

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
922.1	922	771.18	923	769.88	241.60	0.50%	8	0.011	0.033	1.050	0.13	0.677	4.9	19.6
923.1	923	769.88	926	768.39	276.80	0.50%	8	0.011	0.041	1.230	0.29	0.677	6.0	42.8
924.1	924	772.09	925	771.24	150.80	0.60%	8	0.011	0.003	0.630	0.02	0.693	0.5	3.2
925.1	925	771.24	926	768.39	150.90	1.90%	8	0.011	0.010	0.790	0.04	1.269	0.8	6.3
926.1	926	768.39	927	767.70	121.10	0.60%	8	0.011	0.062	1.530	0.16	0.697	8.9	23.6
927.1	927	767.70	908	765.22	103.30	2.40%	8	0.011	0.064	1.550	0.11	1.430	4.5	16.5
928.1	928	777.02	929	773.15	198.60	1.90%	8	0.011	0.005	0.680	0.03	1.288	0.4	4.4
929.1	929	773.15	906	766.63	227.90	2.90%	8	0.011	0.014	0.850	0.05	1.561	0.9	7.3
930.1	930	785.07	931	783.83	153.10	0.80%	8	0.011	0.005	0.630	0.02	0.831	0.6	2.9
931.1	931	783.83	903	770.31	313.20	4.30%	8	0.011	0.031	1.110	0.08	1.918	1.6	11.3
932.1	932	785.98	933	785.52	70.50	0.70%	8	0.011	0.007	0.720	0.03	0.745	1.0	4.8
933.1	933	785.52	934	784.53	177.90	0.60%	8	0.011	0.012	0.920	0.06	0.689	1.8	9.7
934.1	934	784.53	931	783.83	119.70	0.60%	8	0.011	0.019	1.050	0.08	0.706	2.6	12.2
935.1	935	781.37	936	780.71	112.70	0.60%	8	0.011	0.007	0.710	0.03	0.707	0.9	4.7
936.1	936	780.71	937	780.12	98.40	0.60%	8	0.011	0.011	0.830	0.05	0.715	1.5	7.4
937.1	937	780.12	1101	779.00	106.50	1.10%	8	0.011	0.016	0.890	0.05	0.946	1.7	8.1
938.1	938	668.45	453	666.79	103.30	1.60%	21	0.011	6.291	5.350	1.24	15.340	41.0	70.7
939.1	939	670.03	938	668.45	151.30	1.00%	10	0.012	0.200	2.830	0.21	1.568	12.7	25.4
940.1	940	670.28	939	670.03	60.60	0.40%	10	0.012	0.200	2.040	0.27	0.985	20.3	32.1
941.1	941	671.08	940	670.28	281.10	0.30%	10	0.012	0.164	1.650	0.35	0.818	20.0	42.0
942.1	942	671.88	941	671.08	279.70	0.30%	10	0.012	0.125	1.490	0.32	0.820	15.2	38.3
943.1	943	673.41	942	671.88	143.80	1.10%	10	0.012	0.100	2.060	0.16	1.582	6.3	18.7
944.1	944	675.05	943	673.41	169.90	1.00%	10	0.012	0.094	2.000	0.16	1.507	6.2	18.7
945.1	945	676.33	944	675.05	474.20	0.30%	10	0.012	0.079	1.200	0.27	0.797	9.9	32.6
946.1	946	673.09	940	670.28	473.40	0.60%	8	0.012	0.004	0.570	0.16	0.652	0.7	24.4
947.1	947	674.19	941	671.08	473.00	0.70%	8	0.012	0.005	0.580	0.18	0.686	0.8	27.0
948.1	948	673.16	942	671.88	474.00	0.30%	8	0.012	0.005	0.690	0.10	0.440	1.0	15.4
949.1	949	678.23	957	676.66	343.00	0.50%	8	0.012	0.016	0.850	0.05	0.572	2.8	6.8
950.1	950	679.33	949	678.23	261.30	0.40%	8	0.012	0.006	0.780	0.16	0.549	1.2	23.3
951.1	951	679.75	954	678.72	86.20	1.20%	8	0.012	0.031	1.250	0.10	0.925	3.3	15.3
952.1	952	684.55	951	679.75	427.40	1.10%	8	0.012	0.010	0.770	0.04	0.897	1.2	5.6
953.1	953	679.54	954	678.72	134.10	0.60%	8	0.012	0.004	0.640	0.02	0.662	0.6	3.3
954.1	954	678.72	955	678.08	95.10	0.70%	10	0.012	0.042	1.220	0.13	1.259	3.3	15.3
955.1	955	678.08	956	676.99	203.40	0.50%	10	0.012	0.042	1.130	0.13	1.123	3.7	16.1
956.1	956	676.99	957	676.66	90.50	0.40%	10	0.012	0.047	1.050	0.15	0.926	5.1	18.6
957.1	957	676.66	945	676.33	92.90	0.40%	10	0.012	0.077	1.310	0.19	0.914	8.4	22.2
958.1	958	675.09	959	673.65	285.60	0.50%	8	0.011	0.000	0.000	0.14	0.655	0.0	21.6
959.1	959	673.65	960	670.45	229.60	1.40%	8	0.011	0.003	0.130	0.10	1.090	0.2	14.5
960.1	960	670.45	938	668.45	233.60	0.90%	8	0.011	0.162	2.650	0.21	0.854	19.0	31.6
961.1	961	655.67	963	654.37	330.30	0.40%	8	0.011	0.142	1.910	0.24	0.579	24.6	36.6

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
962.1	962	655.50	963	654.37	261.50	0.40%	8	0.011	0.011	0.630	0.12	0.607	1.9	18.3
963.1	963	654.37	2438	651.80	333.20	0.80%	8	0.011	0.171	2.600	0.22	0.811	21.1	33.3
964.1	964	649.45	965	644.91	161.50	2.80%	8	0.011	0.009	0.770	0.04	1.547	0.6	5.9
965.1	965	644.91	968	629.71	378.50	4.00%	10	0.011	0.574	6.130	0.83	3.354	17.1	100.0
966.1	966	625.59	LS_SRP1	623.99	60.90	2.60%	10	0.011	0.592	1.680	0.83	2.712	21.8	100.0
967.1	967	627.75	966	625.59	209.60	1.00%	10	0.011	0.592	1.680	0.83	1.699	34.8	100.0
968.1	968	629.71	967	627.75	183.00	1.10%	10	0.011	0.591	1.670	0.83	1.732	34.1	100.0
969.1	969	650.05	965	644.91	365.50	1.40%	10	0.011	0.552	4.680	0.67	1.985	27.8	80.9
970.1	970	651.42	969	650.05	426.20	0.30%	10	0.011	0.515	2.660	0.45	0.949	54.3	53.9
971.1	971	653.80	2438	651.80	277.90	0.70%	10	0.011	0.321	3.180	0.47	1.420	22.6	56.8
972.1	972	654.67	971	653.80	287.60	0.30%	10	0.011	0.313	2.240	0.44	0.920	34.0	52.2
973.1	973	657.65	972	654.67	405.10	0.70%	8	0.011	0.025	0.720	0.14	0.792	3.2	21.1
974.1	974	659.31	973	657.65	265.70	0.60%	8	0.011	0.015	0.960	0.24	0.730	2.0	35.3
975.1	975	655.06	972	654.67	57.10	0.70%	8	0.011	0.000	0.000	0.16	0.763	0.0	23.9
976.1	976	666.53	977	660.40	219.40	2.80%	8	0.011	0.018	0.940	0.06	1.543	1.2	8.9
977.1	977	660.40	978	656.27	400.10	1.00%	8	0.011	0.026	1.130	0.09	0.938	2.8	13.0
978.1	978	656.27	972	654.67	304.20	0.50%	10	0.011	0.257	2.580	0.27	1.214	21.2	32.6
979.1	979	659.07	978	656.27	361.00	0.80%	10	0.011	0.202	2.710	0.42	1.474	13.7	50.4
980.1	980	723.85	981	721.47	445.50	0.50%	10	0.011	1.607	4.560	0.83	1.223	131.4	100.0
981.1	981	721.47	1843	711.94	93.80	10.20%	10	0.011	1.605	13.150	0.31	5.334	30.1	37.8
982.1	982	688.02	983	677.81	500.00	2.00%	10	0.011	1.681	7.270	0.52	2.392	70.3	62.4
983.1	983	677.81	984	663.14	267.60	5.50%	10	0.011	1.849	10.830	0.83	3.918	47.2	100.0
984.1	984	663.14	12	653.54	356.40	2.70%	12	0.011	1.849	8.320	1.00	4.466	41.4	100.0
985.1	985	656.99	1421	656.57	94.40	0.40%	8	0.011	0.035	1.040	0.14	0.616	5.7	20.7
986.1	986	686.84	49	667.50	486.60	4.00%	8	0.011	0.012	0.780	0.67	1.840	0.6	100.0
987.1	987	700.92	48	694.42	266.70	2.40%	8	0.011	0.000	0.000	0.65	1.441	0.0	97.5
988.1	988	684.34	996	675.76	98.90	8.70%	8	0.011	0.022	0.920	0.05	2.718	0.8	7.6
989.1	989	709.12	988	684.34	351.00	7.10%	8	0.011	0.010	0.720	0.67	2.452	0.4	100.0
990.1	990	709.12	989	709.12	240.20	0.00%	8	0.011	0.002	0.040	0.18	0.000	Infinity	27.1
991.1	991	718.80	63	695.01	357.70	6.60%	8	0.011	0.000	0.000	0.67	2.380	0.0	100.0
992.1	992	711.30	993	700.28	494.10	2.20%	8	0.011	0.002	0.580	0.63	1.378	0.2	93.8
993.1	993	700.28	994	693.77	124.70	5.20%	8	0.011	0.018	0.880	0.05	2.109	0.9	7.1
994.1	994	693.77	995	686.80	126.40	5.50%	8	0.011	0.023	1.010	0.07	2.168	1.0	10.1
995.1	995	686.80	996	675.76	170.70	6.50%	8	0.011	0.026	1.050	0.07	2.347	1.1	10.4
996.1	996	675.76	1421	656.57	319.30	6.00%	8	0.011	0.055	1.350	0.08	2.263	2.4	12.7
997.1	997	700.49	1017	697.90	490.60	0.50%	10	0.012	1.145	3.490	0.83	1.115	102.8	100.0
998.1	998	702.05	997	700.49	431.00	0.40%	10	0.012	1.144	3.240	0.83	0.923	123.9	100.0
999.1	999	703.85	998	702.05	481.30	0.40%	10	0.012	1.042	2.950	0.83	0.938	111.1	100.0
1000.1	1000	704.51	999	703.85	172.40	0.40%	10	0.012	1.041	2.950	0.83	0.949	109.7	100.0
1001.1	1001	705.64	1000	704.51	156.10	0.70%	8	0.012	1.006	4.460	0.67	0.720	139.7	100.0

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1002.1	1002	706.92	1001	705.64	201.80	0.60%	8	0.012	0.995	4.410	0.67	0.674	147.7	100.0
1003.1	1003	708.11	1002	706.92	218.10	0.50%	8	0.012	0.895	3.960	0.67	0.625	143.2	100.0
1004.1	1004	709.38	1003	708.11	192.30	0.70%	8	0.012	0.892	3.950	0.67	0.688	129.7	100.0
1005.1	1005	716.31	1004	709.38	462.80	1.50%	8	0.012	0.680	3.010	0.67	1.035	65.7	100.0
1006.1	1006	728.58	1005	716.31	265.60	4.60%	8	0.012	0.646	6.900	0.67	1.818	35.5	100.0
1007.1	1007	733.88	1006	728.58	250.90	2.10%	8	0.012	0.641	5.360	0.67	1.230	52.1	100.0
1008.1	1008	736.09	1007	733.88	163.70	1.40%	8	0.012	0.636	4.510	0.40	0.983	64.7	59.9
1009.1	1009	738.36	1008	736.09	258.10	0.90%	8	0.012	0.634	3.790	0.67	0.794	79.9	100.0
1010.1	1010	741.59	1009	738.36	455.20	0.70%	8	0.012	0.588	3.420	0.65	0.713	82.5	98.2
1011.1	1011	743.20	1010	741.59	298.00	0.50%	8	0.012	0.588	3.030	0.53	0.622	94.5	80.2
1012.1	1012	744.20	1011	743.20	192.10	0.50%	8	0.012	0.587	3.010	0.54	0.611	96.1	80.7
1013.1	1013	746.20	1012	744.20	433.70	0.50%	8	0.012	0.587	2.790	0.59	0.575	102.1	87.9
1014.1	1014	746.79	1013	746.20	145.30	0.40%	8	0.012	0.586	2.790	0.58	0.539	108.7	87.7
1015.1	1015	747.97	1014	746.79	328.70	0.40%	8	0.012	0.585	2.590	0.67	0.507	115.5	100.0
1016.1	1016	748.65	1015	747.97	91.60	0.70%	8	0.012	0.585	2.590	0.67	0.729	80.3	100.0
1017.1	1017	697.90	1018	697.09	406.60	0.20%	21	0.011	2.337	3.390	0.80	5.402	43.3	45.5
1018.1	1018	697.09	1019	695.99	415.00	0.30%	21	0.011	2.345	3.710	0.75	6.231	37.6	42.6
1019.1	1019	695.99	1020	694.90	415.00	0.30%	21	0.011	2.347	3.700	0.75	6.203	37.8	42.7
1020.1	1020	694.90	2158	693.28	409.70	0.40%	21	0.011	2.351	4.280	0.67	7.610	30.9	38.4
1021.1	1021	694.63	2158	693.28	41.90	3.20%	12	0.011	2.623	9.730	0.52	4.886	53.7	52.4
1022.1	1022	691.19	1025	689.55	313.00	0.50%	8	0.011	0.048	1.310	0.15	0.668	7.1	21.8
1023.1	1023	692.49	1022	691.19	245.00	0.50%	8	0.011	0.000	0.000	0.00	0.672	0.0	0.0
1024.1	1024	693.13	1025	689.55	146.10	2.40%	8	0.011	0.000	0.000	0.00	1.445	0.0	0.0
1025.1	1025	689.55	1031	683.52	300.00	2.00%	8	0.011	0.068	1.630	0.12	1.309	5.2	18.0
1026.1	1026	679.20	1033	673.36	232.10	2.50%	8	0.011	0.000	0.000	0.00	1.464	0.0	0.0
1027.1	1027	680.53	2442	666.41	398.20	3.50%	8	0.011	0.093	1.800	0.11	1.738	5.4	17.2
1028.1	1028	675.57	1034	667.19	261.80	3.20%	8	0.011	0.000	0.000	0.67	1.651	0.0	100.0
1029.1	1029	676.28	1032	668.75	242.80	3.10%	8	0.011	0.000	0.000	0.00	1.625	0.0	0.0
1030.1	1030	682.61	1027	680.53	398.20	0.50%	8	0.011	0.082	1.680	0.18	0.667	12.2	26.8
1031.1	1031	683.52	1030	682.61	167.50	0.50%	8	0.011	0.077	1.640	0.17	0.680	11.3	26.1
1032.1	1032	668.75	1034	667.19	299.10	0.50%	8	0.011	0.045	1.280	0.14	0.667	6.8	21.4
1033.1	1033	673.36	1032	668.75	300.00	1.50%	8	0.011	0.023	1.090	0.08	1.144	2.0	12.2
1034.1	1034	667.19	1041	664.97	236.40	0.90%	8	0.011	0.058	1.610	0.13	0.894	6.4	20.1
1035.1	1035	681.55	1033	673.36	300.80	2.70%	8	0.011	0.000	0.000	0.00	1.523	0.0	0.0
1036.1	1036	687.12	1037	680.39	399.80	1.70%	8	0.011	0.000	0.000	0.00	1.198	0.0	0.0
1037.1	1037	680.39	1039	674.27	397.00	1.50%	8	0.011	0.008	0.730	0.47	1.146	0.7	70.7
1038.1	1038	675.60	1032	668.75	301.80	2.30%	8	0.011	0.000	0.000	0.00	1.391	0.0	0.0
1039.1	1039	674.27	1041	664.97	140.80	6.60%	8	0.011	0.019	0.880	0.05	2.372	0.8	6.9
1040.1	1040	678.06	1039	674.27	150.30	2.50%	8	0.011	0.000	0.000	0.00	1.466	0.0	0.0
1041.1	1041	664.97	1072	658.52	324.20	2.00%	8	0.011	0.090	1.860	0.13	1.302	6.9	20.0

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1042.1	1042	739.84	1043	733.20	267.90	2.50%	8	0.012	0.029	1.170	0.67	1.332	2.2	100.0
1043.1	1043	733.20	1044	731.44	230.40	0.80%	8	0.012	0.039	1.270	0.13	0.740	5.3	19.4
1044.1	1044	731.44	1051	724.55	520.70	1.30%	8	0.012	0.049	1.500	0.12	0.973	5.1	18.5
1045.1	1045	746.17	1046	733.72	460.40	2.70%	8	0.012	0.002	0.580	0.67	1.391	0.2	100.0
1046.1	1046	733.72	1048	727.47	276.70	2.30%	8	0.012	0.022	1.050	0.67	1.272	1.7	100.0
1047.1	1047	743.51	1048	727.47	392.80	4.10%	8	0.012	0.005	0.620	0.67	1.710	0.3	100.0
1048.1	1048	727.47	1058	726.23	251.30	0.50%	8	0.012	0.018	0.910	0.22	0.594	3.0	32.7
1048.2	1048	727.47	1049	723.49	262.10	1.50%	8	0.012	0.031	1.180	0.49	1.043	3.0	73.0
1049.1	1049	723.49	1050	719.98	267.70	1.30%	8	0.012	0.037	1.340	0.46	0.969	3.8	69.2
1050.1	1050	719.98	1054	719.30	129.20	0.50%	8	0.012	0.132	1.940	0.23	0.614	21.6	34.2
1051.1	1051	724.55	1050	719.98	269.10	1.70%	8	0.012	0.083	1.840	0.60	1.103	7.5	89.5
1052.1	1052	730.13	1051	724.55	361.90	1.50%	8	0.012	0.001	0.530	0.40	1.051	0.1	60.5
1053.1	1053	718.97	1181	717.39	148.10	1.10%	8	0.012	0.135	2.500	0.19	0.874	15.5	28.8
1054.1	1054	719.30	1053	718.97	64.80	0.50%	8	0.012	0.135	1.930	0.23	0.604	22.4	34.8
1055.1	1055	720.03	1061	716.37	388.50	0.90%	8	0.012	0.020	1.020	0.34	0.821	2.4	50.4
1056.1	1056	727.57	1055	720.03	224.60	3.40%	8	0.012	0.001	0.530	0.00	1.550	0.1	0.7
1057.1	1057	721.00	1055	720.03	174.90	0.60%	8	0.012	0.006	0.720	0.03	0.630	1.0	5.1
1058.1	1058	726.23	1059	724.55	295.90	0.60%	8	0.012	0.075	1.570	0.34	0.638	11.7	51.5
1059.1	1059	724.55	1060	724.29	32.70	0.80%	8	0.012	0.085	1.870	0.17	0.755	11.2	25.5
1060.1	1060	724.29	1005	716.31	401.40	2.00%	8	0.012	0.018	0.280	0.22	1.193	1.5	32.4
1060.2	1060	724.29	1061	716.37	320.40	2.50%	8	0.012	0.048	1.390	0.10	1.330	3.6	15.5
1061.1	1061	716.37	1062	712.13	414.80	1.00%	8	0.012	0.073	1.810	0.15	0.855	8.5	22.2
1062.1	1062	712.13	1002	706.92	251.70	2.10%	8	0.012	0.089	0.390	0.67	1.217	7.3	100.0
1063.1	1063	721.02	1064	718.90	130.70	1.60%	8	0.012	0.001	0.540	0.00	1.077	0.1	0.7
1064.1	1064	718.90	1065	715.12	245.80	1.50%	8	0.012	0.007	0.660	0.02	1.049	0.7	3.2
1065.1	1065	715.12	1000	704.51	280.10	3.80%	8	0.012	0.017	0.850	0.67	1.647	1.0	100.0
1066.1	1066	684.52	1067	682.45	217.70	1.00%	8	0.011	0.020	1.010	0.07	0.900	2.2	10.5
1067.1	1067	682.45	2442	666.41	140.90	11.40%	8	0.011	0.033	1.060	0.06	3.114	1.1	9.1
1068.1	1068	665.15	979	659.07	308.60	2.00%	8	0.011	0.159	2.570	0.17	1.296	12.3	25.3
1069.1	1069	665.73	1068	665.15	149.10	0.40%	8	0.011	0.005	0.650	0.02	0.576	0.8	3.5
1070.1	1070	675.77	1071	669.14	324.60	2.00%	8	0.011	0.012	0.810	0.04	1.319	0.9	6.4
1071.1	1071	669.14	979	659.07	396.90	2.50%	8	0.011	0.024	1.040	0.67	1.470	1.6	100.0
1072.1	1072	658.52	2476	656.02	309.10	0.80%	8	0.011	0.112	2.250	0.18	0.830	13.4	27.2
1073.1	1073	674.98	1072	658.52	379.00	4.30%	8	0.011	0.005	0.610	0.67	1.923	0.2	100.0
1074.1	1074	672.40	1075	668.01	488.10	0.90%	8	0.011	0.000	0.000	0.24	0.875	0.0	36.6
1075.1	1075	668.01	961	655.67	410.50	3.00%	8	0.011	0.013	0.830	0.05	1.600	0.8	6.9
1076.1	1076	671.00	1075	668.01	91.70	3.30%	8	0.011	0.000	0.000	0.00	1.667	0.0	0.0
1077.1	1077	667.50	1078	656.03	272.70	4.20%	8	0.011	0.005	0.610	0.67	1.893	0.2	100.0
1078.1	1078	656.03	969	650.05	263.60	2.30%	8	0.011	0.014	0.830	0.64	1.390	1.0	96.3
1079.1	1079	779.00	1080	775.00	171.40	2.30%	8	0.011	0.000	0.000	0.00	1.410	0.0	0.0

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1080.1	1080	775.00	1081	773.40	291.50	0.50%	8	0.011	0.026	1.060	0.27	0.684	3.8	40.4
1081.1	1081	773.40	1086	772.00	206.00	0.70%	8	0.011	0.051	1.480	0.14	0.761	6.7	20.9
1082.1	1082	764.00	1087	762.40	227.60	0.70%	8	0.011	0.072	1.770	0.16	0.774	9.3	23.5
1083.1	1083	766.00	1082	764.00	167.00	1.20%	8	0.011	0.072	1.740	0.14	1.010	7.1	20.5
1084.1	1084	767.00	1083	766.00	62.30	1.60%	8	0.011	0.061	1.580	0.12	1.169	5.3	18.0
1085.1	1085	769.00	1084	767.00	153.20	1.30%	8	0.011	0.061	1.610	0.13	1.055	5.8	18.9
1086.1	1086	772.00	1085	769.00	193.40	1.60%	8	0.011	0.061	1.580	0.12	1.150	5.3	18.1
1087.1	1087	762.40	1088	758.00	216.30	2.00%	8	0.011	0.081	1.750	0.12	1.316	6.1	18.7
1088.1	1088	758.00	1089	756.40	282.50	0.60%	8	0.011	0.087	1.980	0.32	0.695	12.5	48.4
1089.1	1089	756.40	1090	754.40	130.10	1.50%	8	0.011	0.686	5.170	0.38	1.145	59.9	56.9
1090.1	1090	754.40	1091	752.40	120.30	1.70%	8	0.011	0.690	5.340	0.37	1.190	58.0	55.7
1091.1	1091	752.40	1092	745.73	195.90	3.40%	12	0.011	0.740	4.790	0.34	5.022	14.7	34.4
1092.1	1092	745.73	1094	743.88	179.20	1.00%	12	0.011	1.189	5.170	0.46	2.765	43.0	46.3
1093.1	1093	748.00	1092	745.73	249.90	0.90%	8	0.011	0.450	3.780	0.57	0.880	51.1	86.2
1094.1	1094	743.88	1132	739.22	466.90	1.00%	12	0.011	1.189	5.100	0.73	2.719	43.7	72.6
1095.1	1095	761.00	1096	757.00	277.60	1.40%	8	0.011	0.000	0.000	0.40	1.108	0.0	60.0
1096.1	1096	757.00	1091	752.40	450.40	1.00%	8	0.011	0.013	0.650	0.27	0.933	1.4	39.8
1097.1	1097	779.00	1099	777.90	74.10	1.50%	8	0.011	0.000	0.000	0.00	1.125	0.0	0.0
1098.1	1098	780.00	1099	777.90	176.70	1.20%	8	0.011	0.007	0.670	0.02	1.006	0.7	3.4
1099.1	1099	777.90	1100	776.69	223.30	0.50%	8	0.011	0.015	1.000	0.08	0.679	2.3	12.0
1100.1	1100	776.69	1103	776.11	96.00	0.60%	8	0.011	0.040	1.250	0.13	0.718	5.5	19.9
1101.1	1101	779.00	1100	776.69	160.40	1.40%	8	0.011	0.018	0.900	0.05	1.108	1.6	7.8
1102.1	1102	779.00	1105	774.00	164.50	3.00%	8	0.011	0.002	0.550	0.01	1.609	0.1	1.0
1103.1	1103	776.11	1104	774.80	242.60	0.50%	8	0.011	0.043	1.220	0.14	0.678	6.3	21.2
1104.1	1104	774.80	1105	774.00	132.40	0.60%	8	0.011	0.049	1.360	0.14	0.717	6.8	21.5
1105.1	1105	774.00	1106	772.31	312.50	0.50%	8	0.011	0.058	1.460	0.15	0.679	8.6	23.2
1106.1	1106	772.31	1108	771.60	122.50	0.60%	8	0.011	0.081	1.740	0.17	0.703	11.6	26.0
1107.1	1107	775.00	1106	772.31	168.20	1.60%	8	0.011	0.009	0.760	0.04	1.167	0.8	5.7
1108.1	1108	771.60	1109	770.63	171.80	0.60%	8	0.011	0.081	1.700	0.18	0.694	11.7	26.5
1109.1	1109	770.63	1110	769.57	192.00	0.60%	8	0.011	0.093	1.780	0.19	0.686	13.5	28.1
1110.1	1110	769.57	1111	763.90	301.30	1.90%	8	0.011	0.096	1.940	0.14	1.266	7.6	20.8
1111.1	1111	763.90	1112	763.21	119.10	0.60%	8	0.011	0.106	1.940	0.19	0.703	15.1	29.1
1112.1	1112	763.21	1113	761.80	255.50	0.60%	8	0.011	0.118	2.090	0.34	0.686	17.2	50.9
1113.1	1113	761.80	1114	761.00	92.90	0.90%	8	0.011	0.433	3.660	0.35	0.857	50.5	51.9
1114.1	1114	761.00	1120	759.00	386.00	0.50%	8	0.011	0.435	3.020	0.55	0.664	65.5	82.4
1115.1	1115	772.00	1112	763.21	85.00	10.30%	8	0.011	0.006	0.620	0.01	2.968	0.2	2.2
1116.1	1116	762.20	1113	761.80	144.70	0.30%	8	0.011	0.309	2.210	0.40	0.485	63.7	59.4
1117.1	1117	762.45	1116	762.20	187.30	0.10%	8	0.011	0.302	1.820	0.46	0.337	89.6	69.1
1118.1	1118	770.00	1119	768.90	420.70	0.30%	8	0.011	0.006	0.720	0.04	0.472	1.2	5.4
1119.1	1119	768.90	1120	759.00	362.00	2.70%	8	0.011	0.065	1.080	0.67	1.526	4.3	100.0

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1120.1	1120	759.00	1121	757.90	137.90	0.80%	8	0.011	0.583	3.840	0.42	0.824	70.7	63.7
1121.1	1121	757.90	1089	756.40	265.90	0.60%	8	0.011	0.591	3.340	0.64	0.693	85.2	95.6
1122.1	1122	764.85	1087	762.40	87.70	2.80%	8	0.011	0.003	0.560	0.01	1.543	0.2	1.2
1123.1	1123	770.06	1083	766.00	225.00	1.80%	8	0.011	0.002	0.580	0.01	1.240	0.2	1.9
1124.1	1124	780.00	1125	778.90	130.10	0.80%	8	0.011	0.002	0.560	0.01	0.849	0.3	1.2
1125.1	1125	778.90	1126	776.48	196.20	1.20%	8	0.011	0.007	0.660	0.02	1.025	0.7	3.3
1126.1	1126	776.48	1081	773.40	60.60	5.10%	8	0.011	0.014	0.800	0.04	2.080	0.7	5.6
1127.1	1127	780.00	1128	779.00	165.60	0.60%	8	0.011	0.006	0.680	0.03	0.717	0.8	4.0
1128.1	1128	779.00	1080	775.00	313.10	1.30%	8	0.011	0.014	0.840	0.05	1.043	1.4	7.0
1129.1	1129	727.76	1135	723.65	400.40	1.00%	12	0.012	1.183	4.830	0.49	2.527	46.8	48.6
1130.1	1130	729.83	1129	727.76	197.90	1.00%	12	0.011	1.184	5.190	0.46	2.783	42.6	46.0
1131.1	1131	734.44	1130	729.83	452.10	1.00%	12	0.011	1.186	5.140	0.72	2.748	43.1	72.0
1132.1	1132	739.22	1131	734.44	456.20	1.00%	12	0.011	1.187	5.190	0.73	2.785	42.6	72.6
1133.1	1133	716.32	2063	714.67	13.20	12.50%	12	0.012	1.179	2.320	1.00	8.830	13.4	100.0
1134.1	1134	719.64	1133	716.32	302.70	1.10%	12	0.012	1.180	2.320	1.00	2.612	45.2	100.0
1135.1	1135	723.65	1134	719.64	398.30	1.00%	12	0.012	1.182	2.330	1.00	2.503	47.2	100.0
1136.1	1136	740.04	150	729.80	480.90	2.10%	8	0.013	0.002	0.570	0.58	1.140	0.2	86.9
1137.1	1137	735.43	149	725.31	478.10	2.10%	8	0.013	0.004	0.580	0.57	1.136	0.4	85.8
1138.1	1138	724.06	LS_BM	712.50	116.10	10.00%	8	0.013	0.013	0.870	0.05	2.464	0.5	8.0
1139.1	1139	741.73	156	741.50	36.70	0.60%	8	0.013	0.069	1.480	0.17	0.618	11.2	26.0
1140.1	1140	772.17	1142	771.51	112.00	0.60%	6	0.013	0.000	0.000	0.00	0.278	0.0	0.0
1141.1	1141	770.64	321	770.16	94.30	0.50%	6	0.013	0.000	0.000	0.00	0.259	0.0	0.0
1142.1	1142	771.51	1141	770.64	155.00	0.60%	6	0.013	0.000	0.000	0.00	0.272	0.0	0.0
1143.1	1143	713.50	1144	712.56	280.30	0.30%	12	0.012	2.444	4.810	1.00	1.445	169.2	100.0
1144.1	1144	712.56	1145	711.01	169.80	0.90%	12	0.012	2.439	4.800	1.00	2.384	102.3	100.0
1145.1	1145	711.01	1146	707.80	409.90	0.80%	12	0.012	2.434	4.790	1.00	2.207	110.3	100.0
1146.1	1146	707.80	1147	706.48	215.30	0.60%	12	0.012	2.427	4.780	1.00	1.953	124.3	100.0
1147.1	1147	706.48	1148	705.50	201.10	0.50%	12	0.012	2.420	4.770	1.00	1.741	139.0	100.0
1148.1	1148	705.50	1149	704.49	191.20	0.50%	12	0.012	2.414	4.750	1.00	1.813	133.2	100.0
1149.1	1149	704.49	2437	701.89	299.50	0.90%	12	0.012	2.408	4.740	1.00	2.324	103.6	100.0
1150.1	1150	703.60	2160	699.48	499.30	0.80%	12	0.011	0.485	3.660	0.31	2.472	19.6	30.7
1151.1	1151	707.94	2162	707.40	108.90	0.50%	8	0.012	0.217	2.260	0.29	0.596	36.4	44.1
1152.1	1152	708.73	1151	707.94	138.40	0.60%	8	0.012	0.217	2.380	0.28	0.639	33.9	42.4
1153.1	1153	710.40	1152	708.73	318.60	0.50%	8	0.012	0.061	1.430	0.16	0.613	10.0	24.5
1154.1	1154	711.01	1153	710.40	96.40	0.60%	8	0.012	0.058	1.450	0.16	0.673	8.7	23.4
1155.1	1155	711.69	1154	711.01	120.70	0.60%	8	0.012	0.006	0.400	0.08	0.635	1.0	12.0
1156.1	1156	710.29	1152	708.73	291.50	0.50%	8	0.012	0.140	1.990	0.39	0.619	22.5	58.2
1157.1	1157	711.63	1156	710.29	247.70	0.50%	8	0.012	0.097	1.720	0.33	0.622	15.6	49.9
1158.1	1158	712.72	1157	711.63	198.20	0.50%	8	0.012	0.042	1.180	0.14	0.627	6.8	21.7
1159.1	1159	713.89	1158	712.72	213.50	0.50%	8	0.012	0.035	1.060	0.13	0.626	5.5	20.2

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1160.1	1160	715.08	1159	713.89	212.50	0.60%	8	0.012	0.025	0.980	0.11	0.633	3.9	16.9
1161.1	1161	714.77	1162	713.80	174.40	0.60%	8	0.012	0.008	0.810	0.06	0.631	1.3	8.8
1162.1	1162	713.80	1157	711.63	414.60	0.50%	8	0.012	0.038	1.040	0.15	0.612	6.2	21.8
1163.1	1163	720.73	1162	713.80	283.80	2.40%	8	0.012	0.018	0.940	0.67	1.322	1.3	100.0
1164.1	1164	728.51	1163	720.73	128.60	6.00%	8	0.012	0.015	0.800	0.04	2.081	0.7	5.7
1165.1	1165	727.63	1166	722.83	235.50	2.00%	8	0.012	0.003	0.640	0.02	1.208	0.2	3.5
1166.1	1166	722.83	1160	715.08	335.90	2.30%	8	0.012	0.013	0.840	0.05	1.285	1.0	7.0
1167.1	1167	733.42	1164	728.51	480.80	1.00%	8	0.012	0.003	0.560	0.28	0.855	0.3	42.0
1168.1	1168	704.20	1150	703.60	163.60	0.40%	12	0.012	0.264	2.110	0.30	1.511	17.5	29.5
1169.1	1169	704.98	1168	704.20	224.90	0.30%	12	0.012	0.264	2.070	0.30	1.469	18.0	29.9
1170.1	1170	707.60	1169	704.98	128.30	2.00%	8	0.012	0.004	0.650	0.02	1.209	0.3	3.6
1171.1	1171	706.45	1169	704.98	463.20	0.30%	12	0.012	0.239	1.930	0.37	1.405	17.0	37.4
1172.1	1172	707.66	1171	706.45	370.40	0.30%	12	0.012	0.228	1.920	0.37	1.426	16.0	37.0
1173.1	1173	709.15	1172	707.66	290.90	0.50%	8	0.012	0.210	2.260	0.44	0.606	34.7	65.4
1174.1	1174	715.80	1173	709.15	95.50	7.00%	8	0.012	0.003	0.560	0.01	2.232	0.1	1.3
1175.1	1175	712.51	1154	711.01	281.60	0.50%	8	0.012	0.042	1.150	0.30	0.618	6.9	44.5
1176.1	1176	717.50	1175	712.51	112.10	4.50%	8	0.012	0.003	0.570	0.01	1.785	0.2	1.4
1177.1	1177	729.50	1184	718.50	326.20	3.40%	8	0.012	0.005	0.640	0.02	1.554	0.3	3.1
1178.1	1178	728.50	1179	713.25	378.70	4.00%	8	0.012	0.004	0.580	0.67	1.698	0.2	100.0
1179.1	1179	713.25	1156	710.29	570.90	0.50%	8	0.012	0.018	0.760	0.24	0.609	2.9	36.1
1180.1	1180	716.73	1183	710.96	572.40	1.00%	8	0.012	0.151	2.570	0.47	0.850	17.8	70.0
1181.1	1181	717.39	1180	716.73	110.20	0.60%	8	0.012	0.137	2.050	0.22	0.655	20.9	33.6
1182.1	1182	714.69	1183	710.96	192.50	1.90%	8	0.012	0.014	0.880	0.05	1.178	1.2	8.0
1183.1	1183	710.96	1173	709.15	427.50	0.40%	8	0.012	0.192	2.050	0.29	0.551	34.9	43.4
1184.1	1184	718.50	1175	712.51	211.90	2.80%	8	0.012	0.030	1.170	0.09	1.422	2.1	13.1
1185.1	1185	708.78	1172	707.66	203.00	0.60%	8	0.012	0.001	0.530	0.00	0.628	0.2	0.6
1186.1	1186	711.21	1192	708.89	463.30	0.50%	8	0.012	0.013	0.940	0.20	0.599	2.1	29.5
1187.1	1187	713.00	1186	711.21	278.10	0.60%	8	0.012	0.002	0.580	0.19	0.679	0.3	28.9
1188.1	1188	724.00	1184	718.50	214.10	2.60%	8	0.012	0.013	0.850	0.05	1.356	1.0	7.5
1189.1	1189	729.00	1188	724.00	302.80	1.70%	8	0.012	0.003	0.550	0.01	1.087	0.3	0.9
1190.1	1190	731.00	1180	716.73	366.10	3.90%	8	0.012	0.004	0.590	0.67	1.670	0.2	100.0
1191.1	1191	706.58	998	702.05	176.70	2.60%	8	0.012	0.101	1.950	0.13	1.355	7.4	20.2
1192.1	1192	708.89	1191	706.58	444.60	0.50%	8	0.012	0.028	0.900	0.13	0.610	4.6	19.7
1193.1	1193	710.54	1194	708.63	124.70	1.50%	8	0.012	0.007	0.670	0.02	1.047	0.7	3.3
1194.1	1194	708.63	1191	706.58	234.70	0.90%	8	0.012	0.052	1.540	0.14	0.791	6.5	20.6
1195.1	1195	717.00	1196	712.60	221.10	2.00%	8	0.012	0.003	0.630	0.02	1.194	0.2	3.3
1196.1	1196	712.60	1197	710.07	300.10	0.80%	8	0.012	0.014	0.910	0.06	0.777	1.8	9.2
1197.1	1197	710.07	1194	708.63	267.20	0.50%	8	0.012	0.033	1.010	0.28	0.621	5.3	41.9
1198.1	1198	713.41	1183	710.96	468.10	0.50%	8	0.012	0.002	0.540	0.14	0.612	0.4	21.2
1199.1	1199	711.02	1197	710.07	330.00	0.30%	8	0.012	0.002	0.590	0.01	0.454	0.5	2.1

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1200.1	1200	653.26	427	653.12	10.70	1.30%	8	0.012	0.659	2.920	0.67	0.968	68.1	100.0
1201.1	1201	654.78	1200	653.26	400.10	0.40%	8	0.012	0.506	2.240	0.67	0.522	97.0	100.0
1202.1	1202	656.13	1201	654.78	340.10	0.40%	8	0.012	0.505	2.240	0.67	0.533	94.7	100.0
1203.1	1203	677.12	1204	674.45	267.20	1.00%	8	0.012	0.005	0.630	0.29	0.846	0.6	42.9
1204.1	1204	674.45	1205	673.54	91.00	1.00%	8	0.012	0.011	0.810	0.04	0.846	1.3	6.5
1205.1	1205	673.54	1206	668.23	409.30	1.30%	8	0.012	0.017	0.910	0.06	0.964	1.8	8.5
1206.1	1206	668.23	1222	667.01	232.80	0.50%	8	0.012	0.057	1.350	0.16	0.612	9.3	24.2
1207.1	1207	675.84	1208	672.68	395.00	0.80%	8	0.012	0.000	0.000	0.23	0.757	0.0	33.9
1208.1	1208	672.68	1206	668.23	323.20	1.40%	8	0.012	0.014	0.850	0.05	0.993	1.4	7.3
1209.1	1209	672.99	1217	671.03	307.40	0.60%	8	0.012	0.007	0.740	0.04	0.676	1.0	5.5
1210.1	1210	672.29	1211	671.91	63.80	0.60%	8	0.012	0.002	0.540	0.00	0.653	0.2	0.7
1211.1	1211	671.91	1212	671.27	106.10	0.60%	8	0.012	0.003	0.610	0.02	0.657	0.5	2.5
1212.1	1212	671.27	1213	669.22	409.40	0.50%	8	0.012	0.012	0.900	0.06	0.599	2.0	9.3
1213.1	1213	669.22	1214	667.17	409.60	0.50%	8	0.012	0.027	0.910	0.12	0.599	4.5	18.7
1214.1	1214	667.17	1215	663.07	422.40	1.00%	8	0.012	0.040	1.400	0.12	0.834	4.8	18.5
1215.1	1215	663.07	459	661.85	127.70	1.00%	8	0.012	0.114	2.260	0.18	0.827	13.8	27.5
1216.1	1216	664.24	1215	663.07	292.30	0.40%	8	0.012	0.054	1.170	0.29	0.535	10.1	43.3
1217.1	1217	671.03	1218	669.71	352.40	0.40%	8	0.012	0.014	0.960	0.17	0.518	2.7	25.8
1218.1	1218	669.71	1219	666.44	420.10	0.80%	8	0.012	0.026	1.150	0.10	0.747	3.5	15.5
1219.1	1219	666.44	1216	664.24	299.60	0.70%	8	0.012	0.049	1.390	0.14	0.725	6.7	21.3
1220.1	1220	667.25	1219	666.44	181.90	0.40%	8	0.012	0.007	0.590	0.07	0.565	1.3	10.3
1221.1	1221	667.23	448	663.00	356.40	1.20%	8	0.012	0.003	0.560	0.31	0.922	0.3	46.5
1222.1	1222	667.01	1223	665.37	329.50	0.50%	8	0.012	0.062	1.360	0.17	0.597	10.4	25.6
1223.1	1223	665.37	468	662.83	304.40	0.80%	8	0.012	0.090	1.930	0.15	0.773	11.6	22.0
1224.1	1224	673.90	1225	666.24	195.30	3.90%	8	0.012	0.005	0.620	0.02	1.676	0.3	2.3
1225.1	1225	666.24	1226	660.52	338.40	1.70%	8	0.012	0.012	0.760	0.03	1.100	1.1	5.1
1226.1	1226	660.52	1227	659.30	71.00	1.70%	8	0.012	0.024	1.040	0.07	1.109	2.2	10.7
1227.1	1227	659.30	1228	658.07	308.50	0.40%	8	0.012	0.063	1.260	0.18	0.534	11.7	27.2
1228.1	1228	658.07	1229	656.87	299.60	0.40%	8	0.012	0.097	1.550	0.21	0.536	18.2	32.2
1229.1	1229	656.87	1230	656.35	130.40	0.40%	8	0.012	0.130	1.740	0.24	0.534	24.3	36.6
1230.1	1230	656.35	1235	655.23	283.00	0.40%	8	0.012	0.137	1.100	0.47	0.532	25.8	70.9
1231.1	1231	669.31	1233	665.18	243.70	1.70%	8	0.012	0.008	0.690	0.02	1.102	0.8	3.7
1232.1	1232	670.69	1234	664.24	293.60	2.20%	8	0.012	0.009	0.730	0.67	1.254	0.7	100.0
1233.1	1233	665.18	1228	658.07	325.00	2.20%	8	0.012	0.015	0.880	0.05	1.251	1.2	8.0
1234.1	1234	664.24	1229	656.87	275.30	2.70%	8	0.012	0.016	0.870	0.67	1.384	1.1	100.0
1235.1	1235	655.23	1200	653.26	512.50	0.40%	8	0.012	0.148	0.660	0.67	0.525	28.3	100.0
1236.1	1236	664.77	2362	663.91	185.40	0.50%	8	0.012	0.007	0.720	0.03	0.576	1.2	5.0
1237.1	1237	662.26	1238	661.93	84.40	0.40%	8	0.012	0.028	0.820	0.14	0.529	5.3	20.9
1238.1	1238	661.93	1227	659.30	289.90	0.90%	8	0.012	0.035	1.240	0.38	0.806	4.3	57.7
1239.1	1239	672.23	583	668.60	353.90	1.00%	8	0.011	0.006	0.650	0.28	0.935	0.7	42.0

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1240.1	1240	673.58	1239	672.23	257.10	0.50%	8	0.011	0.005	0.690	0.16	0.669	0.8	24.6
1241.1	1241	675.84	1240	673.58	293.30	0.80%	8	0.011	0.004	0.620	0.24	0.810	0.5	36.5
1242.1	1242	692.62	1241	675.84	400.20	4.20%	8	0.011	0.003	0.570	0.01	1.890	0.2	1.5
1243.1	1243	699.84	1242	692.62	399.20	1.80%	8	0.011	0.001	0.540	0.00	1.241	0.1	0.7
1244.1	1244	707.02	1243	699.84	285.50	2.50%	8	0.011	0.000	0.470	0.67	1.464	0.0	100.0
1245.1	1245	684.97	577	670.17	293.90	5.00%	8	0.011	0.008	0.690	0.67	2.071	0.4	100.0
1246.1	1246	687.69	1245	684.97	306.40	0.90%	8	0.011	0.004	0.600	0.01	0.870	0.5	2.0
1247.1	1247	693.60	1246	687.69	139.90	4.20%	8	0.011	0.000	0.000	0.00	1.897	0.0	0.0
1248.1	1248	706.00	1249	696.92	314.60	2.90%	8	0.011	0.001	0.520	0.00	1.568	0.0	0.5
1249.1	1249	696.92	1246	687.69	476.10	1.90%	8	0.011	0.002	0.540	0.52	1.285	0.1	77.7
1250.1	1250	703.25	1251	690.27	449.90	2.90%	8	0.011	0.001	0.520	0.67	1.568	0.0	100.0
1251.1	1251	690.27	1245	684.97	435.60	1.20%	8	0.011	0.002	0.550	0.01	1.018	0.2	0.8
1252.1	1252	620.60	LS_SRP1	620.54	26.70	0.20%	27	0.011	2.677	1.040	2.25	11.205	23.9	100.0
1253.1	1253	621.00	1252	620.60	159.20	0.30%	27	0.011	2.678	1.040	2.25	11.859	22.6	100.0
1254.1	1254	630.59	1253	621.00	578.10	1.70%	27	0.011	2.684	1.040	2.25	30.467	8.8	100.0
1255.1	1255	645.21	1254	630.59	705.70	2.10%	27	0.011	2.696	7.860	0.43	34.047	7.9	19.1
1256.1	1256	645.68	1255	645.21	182.60	0.30%	27	0.011	2.705	3.810	0.72	12.001	22.5	32.0
1257.1	1257	649.42	875	647.93	387.30	0.40%	27	0.011	2.414	4.190	0.73	14.671	16.5	32.3
1258.1	1258	688.89	2131	687.77	300.00	0.40%	8	0.011	0.044	1.100	0.16	0.564	7.8	23.3
1259.1	1259	691.09	1258	688.89	300.60	0.70%	8	0.011	0.044	1.400	0.13	0.790	5.6	19.7
1260.1	1260	697.45	1259	691.09	417.30	1.50%	8	0.011	0.000	0.000	0.00	1.140	0.0	0.0
1261.1	1261	701.12	1260	697.45	238.30	1.50%	8	0.011	0.000	0.000	0.00	1.146	0.0	0.0
1262.1	1262	678.74	32	673.90	49.80	9.70%	12	0.011	0.048	1.190	0.06	8.484	0.6	6.3
1263.1	1263	678.98	1262	678.74	34.70	0.70%	12	0.011	0.048	1.370	0.12	2.264	2.1	12.1
1264.1	1264	680.32	1263	678.98	309.00	0.40%	12	0.011	0.048	1.160	0.13	1.792	2.7	13.5
1265.1	1265	680.74	1264	680.32	76.00	0.60%	12	0.011	0.047	1.250	0.13	2.023	2.3	12.8
1266.1	1266	682.44	1265	680.74	411.40	0.40%	12	0.011	0.047	1.130	0.14	1.749	2.7	13.6
1267.1	1267	684.63	2436	683.21	304.50	0.50%	12	0.011	0.041	1.100	0.13	1.858	2.2	12.6
1268.1	1268	686.66	1267	684.63	373.80	0.50%	12	0.011	0.040	1.120	0.27	2.005	2.0	26.8
1269.1	1269	689.15	1268	686.66	345.90	0.70%	12	0.011	0.040	1.270	0.11	2.309	1.7	11.2
1270.1	1270	692.32	1269	689.15	437.60	0.70%	12	0.011	0.040	1.240	0.11	2.316	1.7	11.3
1271.1	1271	694.39	1270	692.32	394.80	0.50%	12	0.011	0.039	1.100	0.27	1.970	2.0	27.1
1272.1	1272	696.58	1271	694.39	297.40	0.70%	12	0.011	0.039	1.270	0.33	2.335	1.7	33.0
1273.1	1273	699.83	1272	696.58	314.50	1.00%	12	0.011	0.039	1.310	0.10	2.766	1.4	10.1
1274.1	1274	701.86	1273	699.83	387.60	0.50%	12	0.011	0.039	1.090	0.27	1.969	2.0	26.8
1275.1	1275	703.79	1274	701.86	365.30	0.50%	12	0.011	0.039	1.090	0.26	1.978	2.0	26.0
1276.1	1276	704.33	1275	703.79	89.10	0.60%	12	0.011	0.039	1.170	0.12	2.119	1.8	11.7
1277.1	1277	706.71	1276	704.33	459.70	0.50%	12	0.011	0.039	1.110	0.25	1.958	2.0	25.3
1280.1	1280	673.62	1281	663.95	370.60	2.60%	8	0.011	0.001	0.520	0.67	1.491	0.0	100.0
1281.1	1281	663.95	1282	653.40	122.40	8.60%	8	0.011	0.003	0.560	0.01	2.710	0.1	1.2

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1282.1	1282	653.40	2192	652.02	467.00	0.30%	18	0.011	2.423	3.900	0.88	4.361	55.6	58.5
1283.1	1283	719.48	LS_BM	712.50	34.70	20.10%	8	0.013	0.001	0.530	0.00	3.500	0.0	0.7
1284.1	1284	721.00	1283	719.48	265.00	0.60%	8	0.013	0.001	0.530	0.16	0.592	0.2	23.5
1285.1	1285	723.71	1284	721.00	521.20	0.50%	8	0.013	0.000	0.000	0.00	0.563	0.0	0.0
1286.1	1286	776.00	1287	773.00	169.90	1.80%	8	0.012	0.001	0.530	0.00	1.124	0.1	0.6
1287.1	1287	773.00	1288	771.00	320.90	0.60%	8	0.012	0.002	0.580	0.01	0.668	0.3	2.0
1288.1	1288	771.00	1289	764.00	392.90	1.80%	8	0.012	0.003	0.610	0.52	1.129	0.3	77.5
1289.1	1289	764.00	1290	758.00	308.40	1.90%	8	0.012	0.039	1.330	0.10	1.180	3.3	15.7
1290.1	1290	758.00	1291	749.00	288.00	3.10%	8	0.012	0.040	1.280	0.67	1.496	2.7	100.0
1291.1	1291	749.00	1292	742.00	462.70	1.50%	8	0.012	0.043	1.410	0.50	1.041	4.1	75.5
1292.1	1292	742.00	1293	734.00	396.60	2.00%	8	0.012	0.047	1.400	0.67	1.202	3.9	100.0
1293.1	1293	734.00	1294	733.03	36.50	2.70%	8	0.012	0.088	1.820	0.13	1.379	6.4	19.0
1294.1	1294	733.03	2174	728.00	291.80	1.70%	8	0.012	0.089	1.900	0.65	1.111	8.0	96.9
1295.1	1295	718.18	1296	716.68	289.40	0.50%	8	0.012	0.141	1.990	0.38	0.609	23.2	57.7
1296.1	1296	716.68	1297	715.23	288.80	0.50%	8	0.012	0.207	2.230	0.43	0.600	34.5	64.7
1297.1	1297	715.23	1298	713.02	256.30	0.90%	8	0.012	0.218	2.770	0.47	0.786	27.8	71.2
1298.1	1298	713.02	348	710.86	452.60	0.50%	8	0.015	0.357	2.170	0.58	0.468	76.2	86.3
1299.1	1299	735.00	1294	733.03	131.00	1.50%	8	0.012	0.000	0.420	0.00	1.038	0.0	0.5
1300.1	1300	780.00	1301	776.00	137.40	2.90%	8	0.012	0.001	0.530	0.00	1.444	0.1	0.6
1301.1	1301	776.00	1302	772.00	446.10	0.90%	8	0.012	0.002	0.560	0.01	0.801	0.3	1.2
1302.1	1302	772.00	2172	769.00	274.70	1.10%	8	0.012	0.020	1.040	0.38	0.884	2.3	56.6
1303.1	1303	775.00	1288	771.00	230.30	1.70%	8	0.012	0.000	0.280	0.00	1.115	0.0	0.4
1304.1	1304	740.00	1305	732.00	297.40	2.70%	8	0.012	0.001	0.530	0.67	1.388	0.1	100.0
1305.1	1305	732.00	2174	728.00	301.90	1.30%	8	0.012	0.002	0.540	0.01	0.974	0.2	0.8
1306.1	1306	739.33	1308	728.00	500.20	2.30%	8	0.012	0.001	0.530	0.00	1.273	0.1	0.7
1307.1	1307	740.73	1306	739.33	57.80	2.40%	8	0.012	0.000	0.280	0.00	1.317	0.0	0.4
1308.1	1308	728.00	1296	716.68	325.00	3.50%	8	0.012	0.030	0.790	0.01	1.579	1.9	1.8
1309.1	1309	742.00	1310	733.78	432.10	1.90%	8	0.012	0.000	0.280	0.00	1.167	0.0	0.4
1310.1	1310	733.78	1311	721.86	270.50	4.40%	8	0.012	0.015	0.790	0.67	1.776	0.9	100.0
1311.1	1311	721.86	1314	720.49	253.50	0.50%	8	0.012	0.024	0.940	0.25	0.622	3.9	37.7
1312.1	1312	727.95	1311	721.86	290.20	2.10%	8	0.012	0.002	0.540	0.61	1.226	0.2	92.1
1313.1	1313	729.44	1312	727.95	278.20	0.50%	8	0.012	0.001	0.530	0.15	0.619	0.1	22.9
1314.1	1314	720.49	1295	718.18	370.20	0.60%	8	0.012	0.025	0.870	0.29	0.668	3.8	43.4
1315.1	1315	719.77	1297	715.23	282.40	1.60%	8	0.012	0.000	0.420	0.46	1.073	0.0	68.6
1316.1	1316	738.58	1317	738.00	15.90	3.70%	8	0.012	0.009	0.700	0.03	1.618	0.5	4.0
1317.1	1317	738.00	1293	734.00	289.70	1.40%	8	0.012	0.030	1.240	0.50	0.994	3.0	75.2
1318.1	1318	744.00	1317	738.00	275.50	2.20%	8	0.012	0.021	1.030	0.67	1.249	1.7	100.0
1319.1	1319	754.00	1318	744.00	288.80	3.50%	8	0.012	0.014	0.790	0.67	1.574	0.9	100.0
1320.1	1320	754.50	1319	754.00	288.10	0.20%	8	0.012	0.008	0.720	0.12	0.352	2.4	17.3
1321.1	1321	766.50	1320	754.50	412.40	2.90%	8	0.012	0.001	0.530	0.00	1.443	0.1	0.7

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1322.1	1322	767.38	1321	766.50	130.40	0.70%	8	0.012	0.000	0.520	0.00	0.695	0.1	0.5
1323.1	1323	765.10	1330	757.10	487.30	1.60%	8	0.012	0.003	0.550	0.45	1.084	0.3	67.6
1324.1	1324	760.06	1325	746.76	331.50	4.00%	8	0.012	0.000	0.420	0.00	1.695	0.0	0.5
1325.1	1325	746.76	1318	744.00	271.10	1.00%	8	0.012	0.003	0.580	0.29	0.854	0.4	43.0
1326.1	1326	755.35	1327	747.52	277.60	2.80%	8	0.012	0.000	0.420	0.67	1.421	0.0	100.0
1327.1	1327	747.52	1316	738.58	323.10	2.80%	8	0.012	0.002	0.540	0.01	1.407	0.1	0.8
1328.1	1328	748.50	1329	745.00	420.20	0.80%	8	0.012	0.009	0.760	0.04	0.772	1.2	5.7
1329.1	1329	745.00	1979	743.30	320.10	0.50%	8	0.012	0.040	1.120	0.14	0.617	6.4	21.4
1330.1	1330	757.10	1329	745.00	199.40	6.10%	8	0.012	0.014	0.790	0.04	2.084	0.7	5.5
1331.1	1331	706.40	2019	705.40	17.40	5.80%	8	0.011	0.108	1.880	0.11	2.216	4.9	16.3
1332.1	1332	707.50	1331	706.40	66.80	1.60%	8	0.011	0.108	2.080	0.15	1.184	9.1	22.4
1333.1	1333	714.00	2023	712.65	132.80	1.00%	8	0.011	0.108	2.180	0.17	0.931	11.6	25.3
1334.1	1334	715.81	1333	714.00	334.90	0.50%	8	0.011	0.070	1.610	0.16	0.679	10.3	24.7
1335.1	1335	717.14	1334	715.81	242.10	0.50%	8	0.011	0.050	1.330	0.15	0.684	7.4	22.5
1336.1	1336	726.74	1345	725.14	296.70	0.50%	12	0.011	0.013	0.860	0.21	1.998	0.7	21.1
1337.1	1337	710.92	1277	706.71	218.00	1.90%	12	0.011	0.029	1.130	0.08	3.782	0.8	8.2
1338.1	1338	712.72	1337	710.92	342.00	0.50%	12	0.011	0.029	0.970	0.11	1.974	1.5	10.9
1339.1	1339	714.17	1338	712.72	275.20	0.50%	12	0.011	0.029	0.970	0.25	1.975	1.5	25.3
1340.1	1340	715.57	1339	714.17	254.00	0.60%	12	0.011	0.029	1.000	0.25	2.020	1.4	24.6
1341.1	1341	716.89	1340	715.57	249.60	0.50%	12	0.011	0.029	0.970	0.24	1.979	1.4	23.9
1342.1	1342	718.29	1341	716.89	264.70	0.50%	12	0.011	0.028	0.980	0.25	1.979	1.4	24.6
1343.1	1343	719.27	1342	718.29	177.00	0.60%	12	0.011	0.019	0.890	0.09	2.025	0.9	8.6
1344.1	1344	720.04	1343	719.27	128.80	0.60%	12	0.011	0.019	1.030	0.08	2.104	0.9	7.7
1345.1	1345	725.14	1344	720.04	304.40	1.70%	12	0.011	0.013	0.850	0.05	3.522	0.4	4.9
1346.1	1346	791.98	1347	790.69	215.40	0.60%	8	0.011	0.003	0.590	0.01	0.714	0.4	2.1
1347.1	1347	790.69	1348	789.51	217.20	0.50%	8	0.011	0.010	0.840	0.05	0.680	1.5	8.0
1348.1	1348	789.51	1349	788.81	143.40	0.50%	8	0.011	0.015	1.000	0.08	0.645	2.3	11.5
1349.1	1349	788.81	1350	781.17	235.80	3.20%	8	0.011	0.020	0.960	0.06	1.661	1.2	9.2
1350.1	1350	781.17	1351	775.86	235.90	2.30%	8	0.011	0.028	1.130	0.08	1.385	2.0	12.4
1351.1	1351	775.86	1371	773.23	181.50	1.40%	8	0.011	0.051	1.460	0.11	1.111	4.5	17.2
1352.1	1352	778.64	1351	775.86	52.00	5.40%	8	0.011	0.011	0.750	0.03	2.135	0.5	4.8
1353.1	1353	780.07	1352	778.64	262.00	0.50%	8	0.011	0.011	0.860	0.20	0.682	1.7	29.6
1354.1	1354	785.62	1353	780.07	172.50	3.20%	8	0.011	0.008	0.660	0.02	1.656	0.5	3.1
1355.1	1355	791.04	1354	785.62	179.00	3.00%	8	0.011	0.002	0.540	0.00	1.606	0.1	0.7
1356.1	1356	796.15	1357	789.33	260.30	2.60%	8	0.011	0.006	0.660	0.67	1.494	0.4	100.0
1357.1	1357	789.33	1358	786.52	205.00	1.40%	8	0.011	0.018	0.910	0.05	1.081	1.7	8.1
1358.1	1358	786.52	1359	781.88	252.80	1.80%	8	0.011	0.022	1.050	0.54	1.250	1.7	81.0
1359.1	1359	781.88	1360	776.24	237.40	2.40%	8	0.011	0.031	1.180	0.09	1.423	2.2	13.1
1360.1	1360	776.24	1361	766.46	266.40	3.70%	8	0.011	0.043	1.280	0.67	1.768	2.4	100.0
1361.1	1361	766.46	1369	763.33	297.50	1.10%	8	0.011	0.105	2.130	0.48	0.947	11.1	71.6

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1362.1	1362	768.00	1361	766.46	308.00	0.50%	8	0.011	0.046	1.260	0.15	0.653	7.1	21.8
1363.1	1363	780.08	1364	778.47	99.30	1.60%	8	0.011	0.007	0.720	0.03	1.175	0.6	4.8
1364.1	1364	778.47	1366	774.42	170.60	2.40%	8	0.011	0.018	0.940	0.06	1.422	1.3	8.9
1365.1	1365	784.75	1364	778.47	227.70	2.80%	8	0.011	0.001	0.540	0.00	1.533	0.1	0.7
1366.1	1366	774.42	1367	773.49	166.50	0.60%	8	0.011	0.021	1.020	0.10	0.690	3.1	14.7
1367.1	1367	773.49	1411	769.02	181.40	2.50%	8	0.011	0.030	1.170	0.09	1.449	2.1	12.9
1368.1	1368	765.00	1413	763.75	233.00	0.50%	8	0.011	0.000	0.000	0.00	0.676	0.0	0.0
1369.1	1369	763.33	1407	761.71	304.10	0.50%	8	0.011	0.205	2.430	0.27	0.674	30.4	40.0
1370.1	1370	772.23	1369	763.33	266.20	3.30%	8	0.011	0.081	1.690	0.67	1.688	4.8	100.0
1371.1	1371	773.23	1370	772.23	179.10	0.60%	8	0.011	0.074	1.620	0.17	0.690	10.7	25.5
1372.1	1372	782.36	1371	773.23	244.30	3.70%	8	0.011	0.020	0.960	0.06	1.785	1.1	9.2
1373.1	1373	788.70	1374	785.30	143.00	2.40%	8	0.011	0.002	0.540	0.00	1.423	0.1	0.7
1374.1	1374	785.30	1376	783.75	290.70	0.50%	8	0.011	0.006	0.680	0.18	0.674	0.9	27.3
1375.1	1375	786.87	1382	776.68	252.60	4.00%	8	0.011	0.000	0.000	0.67	1.854	0.0	100.0
1376.1	1376	783.75	1372	782.36	257.50	0.50%	8	0.011	0.015	0.980	0.21	0.678	2.2	31.7
1377.1	1377	785.38	1378	774.92	121.20	8.60%	8	0.011	0.008	0.670	0.02	2.711	0.3	3.2
1378.1	1378	774.92	1392	767.35	272.70	2.80%	8	0.011	0.023	1.010	0.67	1.538	1.5	100.0
1379.1	1379	775.49	1378	774.92	94.70	0.60%	8	0.011	0.011	0.860	0.05	0.716	1.6	8.2
1380.1	1380	778.15	1379	775.49	154.30	1.70%	8	0.011	0.007	0.730	0.03	1.212	0.6	5.2
1381.1	1381	778.93	1380	778.15	159.40	0.50%	8	0.011	0.002	0.540	0.00	0.646	0.2	0.7
1382.1	1382	776.68	1383	774.41	250.70	0.90%	8	0.011	0.007	0.670	0.25	0.878	0.7	37.8
1383.1	1383	774.41	1384	770.78	254.10	1.40%	8	0.011	0.017	0.890	0.41	1.103	1.5	62.2
1384.1	1384	770.78	1385	768.63	155.50	1.40%	8	0.011	0.027	1.090	0.08	1.085	2.4	11.6
1385.1	1385	768.63	1386	765.76	199.30	1.40%	8	0.011	0.033	1.230	0.09	1.108	3.0	14.0
1386.1	1386	765.76	1387	764.10	113.80	1.50%	8	0.011	0.041	1.350	0.11	1.115	3.7	16.0
1387.1	1387	764.10	1390	761.59	181.30	1.40%	8	0.011	0.058	1.560	0.12	1.086	5.4	18.3
1388.1	1388	768.89	1387	764.10	248.70	1.90%	8	0.011	0.010	0.750	0.51	1.281	0.8	77.0
1389.1	1389	759.19	1391	758.87	44.60	0.70%	8	0.011	0.073	1.790	0.16	0.782	9.4	23.6
1390.1	1390	761.59	1389	759.19	176.80	1.40%	8	0.011	0.064	1.630	0.13	1.075	6.0	19.1
1391.1	1391	758.87	1410	757.81	191.10	0.60%	8	0.011	0.114	1.950	0.20	0.687	16.6	30.5
1392.1	1392	767.35	1391	758.87	221.00	3.80%	8	0.011	0.033	1.160	0.08	1.808	1.8	12.0
1393.1	1393	777.31	1397	767.47	190.20	5.20%	8	0.011	0.006	0.640	0.02	2.099	0.3	2.8
1394.1	1394	769.74	1396	767.29	164.20	1.50%	8	0.011	0.003	0.600	0.02	1.128	0.2	2.4
1395.1	1395	769.59	1396	767.29	137.80	1.70%	8	0.011	0.009	0.760	0.04	1.193	0.7	5.7
1396.1	1396	767.29	1407	761.71	266.20	2.10%	8	0.011	0.019	0.970	0.62	1.336	1.4	93.3
1397.1	1397	767.47	1398	766.44	180.80	0.60%	8	0.011	0.012	0.880	0.06	0.697	1.8	8.4
1398.1	1398	766.44	1399	756.75	148.00	6.50%	8	0.011	0.018	0.860	0.04	2.361	0.7	6.6
1399.1	1399	756.75	1400	755.93	145.30	0.60%	8	0.011	0.137	2.130	0.22	0.693	19.7	32.7
1400.1	1400	755.93	1403	754.12	342.60	0.50%	8	0.011	0.146	2.150	0.23	0.671	21.7	34.0
1401.1	1401	765.45	1402	761.51	160.40	2.50%	8	0.011	0.004	0.590	0.01	1.447	0.3	1.8

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1402.1	1402	761.51	1403	754.12	192.20	3.80%	8	0.011	0.016	0.890	0.05	1.810	0.9	8.0
1403.1	1403	754.12	1405	753.10	187.80	0.50%	8	0.011	0.169	2.270	0.24	0.680	24.8	36.4
1404.1	1404	752.09	1093	748.00	232.60	1.80%	8	0.011	0.450	4.850	0.29	1.224	36.7	43.0
1405.1	1405	753.10	1404	752.09	178.40	0.60%	8	0.011	0.175	2.310	0.25	0.694	25.2	37.0
1406.1	1406	754.26	1404	752.09	243.20	0.90%	8	0.011	0.258	3.170	0.26	0.872	29.6	38.9
1407.1	1407	761.71	1408	760.67	119.10	0.90%	8	0.011	0.235	3.050	0.25	0.863	27.2	37.4
1408.1	1408	760.67	1409	755.44	231.70	2.30%	8	0.011	0.241	3.350	0.20	1.387	17.4	29.5
1409.1	1409	755.44	1406	754.26	215.40	0.50%	8	0.011	0.250	2.610	0.29	0.683	36.5	44.0
1410.1	1410	757.81	1399	756.75	190.30	0.60%	8	0.011	0.114	1.960	0.20	0.689	16.5	30.5
1411.1	1411	769.02	1362	768.00	181.80	0.60%	8	0.011	0.036	1.110	0.13	0.691	5.2	20.0
1412.1	1412	787.70	1374	785.30	152.30	1.60%	8	0.011	0.000	0.000	0.00	1.159	0.0	0.0
1413.1	1413	763.75	1369	763.33	65.40	0.60%	8	0.011	0.008	0.770	0.06	0.740	1.1	9.1
1414.1	1414	667.39	1415	665.64	357.30	0.50%	8	0.011	0.403	2.890	0.52	0.646	62.4	78.0
1415.1	1415	665.64	1416	664.42	371.60	0.30%	10	0.011	0.402	2.500	0.48	0.959	41.9	57.0
1416.1	1416	664.42	1417	661.40	420.60	0.70%	10	0.011	0.415	3.360	0.32	1.418	29.3	38.2
1417.1	1417	661.40	1418	660.15	500.00	0.20%	10	0.011	0.433	2.300	0.44	0.837	51.7	52.5
1418.1	1418	660.15	1419	655.48	282.10	1.70%	10	0.011	0.456	4.680	0.73	2.153	21.2	88.1
1419.1	1419	655.48	1420	652.06	146.20	2.30%	10	0.011	0.471	5.350	0.25	2.559	18.4	29.7
1420.1	1420	652.06	1838	648.77	343.00	1.00%	10	0.011	1.102	4.880	0.51	1.639	67.2	61.1
1421.1	1421	656.57	1841	645.43	310.50	3.60%	8	0.011	0.097	1.850	0.12	1.748	5.6	18.0
1422.1	1422	644.14	LS_RBSS	644.00	4.10	3.40%	12	0.011	1.663	8.680	0.40	4.999	33.3	40.3
1423.1	1423	687.80	378	685.91	466.10	0.40%	8	0.013	0.074	1.300	0.30	0.497	14.9	45.7
1424.1	1424	689.57	1423	687.80	416.20	0.40%	8	0.013	0.000	0.000	0.00	0.509	0.0	0.0
1425.1	1425	693.84	1424	689.57	347.30	1.20%	8	0.013	0.000	0.000	0.00	0.866	0.0	0.0
1426.1	1426	695.49	1425	693.84	230.70	0.70%	8	0.013	0.000	0.000	0.00	0.660	0.0	0.0
1427.1	1427	750.03	1428	745.84	408.80	1.00%	6	0.013	0.001	0.530	0.00	0.367	0.3	0.9
1428.1	1428	745.84	316	742.47	324.10	1.00%	6	0.013	0.006	0.750	0.04	0.370	1.7	7.9
1429.1	1429	752.11	1427	750.03	198.10	1.10%	6	0.013	0.001	0.530	0.00	0.372	0.2	0.8
1430.1	1430	635.30	2274	632.80	402.70	0.60%	18	0.011	2.541	5.200	0.66	6.322	40.2	44.3
1431.1	1431	605.90	1433	599.00	327.30	2.10%	8	0.011	0.095	1.910	0.13	1.340	7.1	20.2
1432.1	1432	619.00	1431	605.90	419.50	3.10%	8	0.011	0.014	0.850	0.05	1.631	0.9	7.3
1433.1	1433	599.00	LS_BCP4	592.92	65.10	9.30%	8	0.011	0.149	2.200	0.11	2.820	5.3	16.5
1434.1	1434	613.40	1433	599.00	358.60	4.00%	8	0.011	0.032	1.140	0.67	1.850	1.7	100.0
1435.1	1435	616.90	1434	613.40	344.70	1.00%	8	0.011	0.018	0.960	0.07	0.930	1.9	9.8
1436.1	1436	619.54	1435	616.90	348.70	0.80%	8	0.011	0.000	0.000	0.19	0.803	0.0	28.3
1437.1	1437	621.39	1438	617.01	228.40	1.90%	8	0.011	0.161	2.580	0.17	1.278	12.6	24.9
1438.1	1438	617.01	1439	615.50	416.10	0.40%	10	0.011	0.171	1.940	0.25	1.008	16.9	29.7
1439.1	1439	615.50	1440	614.05	441.90	0.30%	10	0.011	0.212	2.020	0.28	0.959	22.1	33.8
1440.1	1440	614.05	1441	612.60	455.60	0.30%	10	0.011	0.261	2.140	0.39	0.944	27.6	47.3
1441.1	1441	612.60	1442	611.15	442.50	0.30%	10	0.011	0.299	2.270	0.33	0.958	31.2	40.0

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1442.1	1442	611.15	1443	609.70	454.00	0.30%	10	0.011	0.319	2.300	0.43	0.946	33.7	51.2
1443.1	1443	609.70	1444	607.18	93.20	2.70%	10	0.011	0.335	4.100	0.20	2.751	12.2	24.3
1444.1	1444	607.18	1998	604.58	294.40	0.90%	10	0.011	0.332	3.370	0.53	1.573	21.1	63.5
1445.1	1445	737.00	1446	731.60	484.00	1.10%	8	0.011	0.005	0.610	0.31	0.975	0.5	47.2
1446.1	1446	731.60	1447	727.50	192.80	2.10%	8	0.011	0.020	0.990	0.07	1.346	1.5	10.0
1447.1	1447	727.50	1448	714.20	295.10	4.50%	8	0.011	0.026	1.020	0.67	1.960	1.3	100.0
1448.1	1448	714.20	1449	713.10	136.50	0.80%	8	0.011	0.055	1.610	0.14	0.829	6.6	20.6
1449.1	1449	713.10	1450	711.90	160.80	0.70%	8	0.011	0.057	1.620	0.14	0.797	7.1	21.2
1450.1	1450	711.90	1451	711.00	127.30	0.70%	8	0.011	0.062	1.660	0.15	0.776	8.0	22.2
1451.1	1451	711.00	1452	708.00	392.80	0.80%	8	0.011	0.067	1.760	0.36	0.807	8.2	54.5
1452.1	1452	708.00	1453	706.00	253.30	0.80%	8	0.011	0.079	1.900	0.36	0.820	9.6	53.6
1453.1	1453	706.00	1454	705.13	133.30	0.70%	8	0.011	0.086	1.880	0.17	0.746	11.5	25.7
1454.1	1454	705.13	1455	701.70	455.00	0.80%	8	0.011	0.092	2.040	0.36	0.801	11.5	54.1
1455.1	1455	701.70	1456	700.60	142.90	0.80%	8	0.011	0.114	2.230	0.19	0.810	14.1	27.8
1456.1	1456	700.60	1457	699.90	105.40	0.70%	8	0.011	0.118	2.140	0.19	0.752	15.6	29.2
1457.1	1457	699.90	1458	697.60	299.50	0.80%	8	0.011	0.123	2.290	0.19	0.809	15.2	28.7
1458.1	1458	697.60	1459	695.40	299.50	0.70%	8	0.011	0.133	2.330	0.20	0.791	16.8	30.1
1459.1	1459	695.40	1460	694.20	159.00	0.80%	8	0.011	0.167	2.560	0.22	0.802	20.8	33.0
1460.1	1460	694.20	1461	691.20	132.40	2.30%	8	0.011	0.171	2.660	0.17	1.389	12.3	25.2
1461.1	1461	691.20	1462	688.90	300.70	0.80%	8	0.011	0.188	2.680	0.23	0.807	23.3	34.9
1462.1	1462	688.90	1463	684.90	301.80	1.30%	8	0.011	0.207	3.160	0.21	1.063	19.5	31.6
1463.1	1463	684.90	1464	673.00	316.30	3.80%	8	0.011	0.232	3.140	0.17	1.790	12.9	25.5
1464.1	1464	673.00	1465	672.15	173.10	0.50%	8	0.011	0.289	2.630	0.33	0.647	44.7	48.9
1465.1	1465	672.15	1836	662.52	509.30	1.90%	8	0.011	0.530	5.200	0.31	1.269	41.7	46.2
1466.1	1466	711.20	1467	701.80	253.30	3.70%	8	0.011	0.000	0.000	0.67	1.778	0.0	100.0
1467.1	1467	701.80	1461	691.20	190.60	5.60%	8	0.011	0.009	0.700	0.03	2.177	0.4	3.9
1468.1	1468	708.30	1459	695.40	315.00	4.10%	8	0.011	0.017	0.830	0.04	1.868	0.9	6.0
1469.1	1469	716.20	1468	708.30	293.40	2.70%	8	0.011	0.008	0.690	0.67	1.515	0.5	100.0
1470.1	1470	728.79	1471	706.39	492.90	4.50%	8	0.011	0.000	0.000	0.67	1.968	0.0	100.0
1471.1	1471	706.39	1472	701.78	109.00	4.20%	8	0.011	0.018	0.930	0.06	1.898	1.0	8.8
1472.1	1472	701.78	1473	699.11	89.00	3.00%	8	0.011	0.202	2.910	0.17	1.599	12.7	25.3
1473.1	1473	699.11	1474	696.73	120.00	2.00%	8	0.011	0.206	3.040	0.19	1.300	15.8	28.4
1474.1	1474	696.73	1475	692.61	300.30	1.40%	8	0.011	0.235	3.430	0.22	1.081	21.7	33.3
1475.1	1475	692.61	1476	690.69	303.00	0.60%	8	0.011	0.263	2.810	0.29	0.735	35.8	43.3
1476.1	1476	690.69	1477	684.68	300.00	2.00%	8	0.011	0.293	3.890	0.22	1.306	22.5	33.5
1477.1	1477	684.68	1478	678.51	305.30	2.00%	8	0.011	0.323	4.170	0.23	1.312	24.6	35.1
1478.1	1478	678.51	1479	669.75	301.60	2.90%	8	0.011	0.349	4.310	0.22	1.573	22.2	33.1
1479.1	1479	669.75	1414	667.39	132.70	1.80%	8	0.011	0.400	4.480	0.28	1.231	32.5	41.7
1480.1	1480	712.60	1475	692.61	500.00	4.00%	8	0.011	0.007	0.670	0.02	1.846	0.4	3.4
1481.1	1481	715.26	1448	714.20	145.50	0.70%	8	0.011	0.021	0.990	0.10	0.788	2.6	14.9

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1482.1	1482	718.71	1481	715.26	459.60	0.80%	8	0.011	0.006	0.680	0.22	0.800	0.8	32.7
1483.1	1483	712.64	1474	696.73	500.00	3.20%	8	0.011	0.013	0.760	0.03	1.647	0.8	4.8
1484.1	1484	672.41	1465	672.15	168.60	0.20%	8	0.011	0.240	1.730	0.39	0.362	66.3	59.1
1485.1	1485	680.17	1484	672.41	301.10	2.60%	8	0.011	0.164	2.570	0.16	1.482	11.1	24.0
1486.1	1486	684.24	1485	680.17	301.10	1.40%	8	0.011	0.135	2.400	0.17	1.073	12.5	25.8
1487.1	1487	688.07	1486	684.24	133.90	2.90%	8	0.011	0.101	1.910	0.13	1.561	6.5	18.8
1488.1	1488	691.60	1487	688.07	168.50	2.10%	8	0.011	0.097	1.920	0.13	1.336	7.3	20.0
1489.1	1489	693.20	1488	691.60	34.80	4.60%	8	0.011	0.072	1.540	0.10	1.979	3.6	14.7
1490.1	1490	698.22	1489	693.20	314.60	1.60%	8	0.011	0.062	1.590	0.12	1.166	5.3	18.4
1491.1	1491	705.75	1490	698.22	271.20	2.80%	8	0.011	0.032	1.180	0.67	1.538	2.1	100.0
1492.1	1492	713.01	1491	705.75	259.20	2.80%	8	0.011	0.024	1.020	0.67	1.545	1.5	100.0
1493.1	1493	716.12	1492	713.01	119.40	2.60%	8	0.011	0.018	0.930	0.06	1.489	1.2	8.8
1494.1	1494	717.57	1493	716.12	113.90	1.30%	8	0.011	0.013	0.810	0.04	1.041	1.3	6.1
1495.1	1495	721.26	1494	717.57	166.30	2.20%	8	0.011	0.000	0.000	0.00	1.375	0.0	0.0
1496.1	1496	723.03	1495	721.26	74.90	2.40%	8	0.011	0.000	0.000	0.00	1.419	0.0	0.0
1497.1	1497	718.45	1498	709.01	451.70	2.10%	8	0.011	0.000	0.000	0.52	1.334	0.0	78.7
1498.1	1498	709.01	1499	695.25	328.30	4.20%	8	0.011	0.010	0.730	0.03	1.890	0.5	4.8
1499.1	1499	695.25	1501	686.58	311.50	2.80%	8	0.011	0.019	0.910	0.05	1.540	1.2	8.0
1500.1	1500	695.91	1499	695.25	91.80	0.70%	8	0.011	0.000	0.000	0.00	0.783	0.0	0.0
1501.1	1501	686.58	1502	674.17	323.70	3.80%	8	0.011	0.029	1.100	0.08	1.807	1.6	11.3
1502.1	1502	674.17	1484	672.41	331.30	0.50%	8	0.011	0.044	1.430	0.12	0.673	6.6	17.7
1503.1	1503	725.60	1504	716.27	312.40	3.00%	8	0.011	0.000	0.000	0.00	1.595	0.0	0.0
1504.1	1504	716.27	1505	703.40	294.80	4.40%	8	0.011	0.013	0.800	0.67	1.929	0.7	100.0
1505.1	1505	703.40	1490	698.22	111.50	4.60%	8	0.011	0.013	0.770	0.03	1.989	0.6	5.0
1506.1	1506	716.48	1507	703.54	379.10	3.40%	8	0.011	0.003	0.560	0.67	1.705	0.2	100.0
1507.1	1507	703.54	1488	691.60	376.90	3.20%	8	0.011	0.015	0.870	0.67	1.643	0.9	100.0
1508.1	1508	721.69	1509	720.98	106.20	0.70%	8	0.011	0.000	0.000	0.00	0.755	0.0	0.0
1509.1	1509	720.98	1510	695.00	464.40	5.60%	8	0.011	0.005	0.620	0.67	2.183	0.2	100.0
1510.1	1510	695.00	1486	684.24	379.90	2.80%	8	0.011	0.019	0.950	0.67	1.553	1.2	100.0
1511.1	1511	715.60	1512	691.00	347.20	7.10%	8	0.011	0.000	0.000	0.00	2.457	0.0	0.0
1512.1	1512	691.00	1485	680.17	343.70	3.20%	8	0.011	0.013	0.760	0.03	1.639	0.8	4.8
1513.1	1513	692.32	1484	672.41	362.00	5.50%	8	0.011	0.011	0.730	0.67	2.165	0.5	100.0
1514.1	1514	703.93	1513	692.32	254.70	4.60%	8	0.011	0.000	0.000	0.67	1.971	0.0	100.0
1515.1	1515	695.12	1476	690.69	219.00	2.00%	8	0.011	0.018	0.940	0.06	1.313	1.3	9.2
1516.1	1516	707.01	1515	695.12	500.60	2.40%	8	0.011	0.000	0.000	0.00	1.422	0.0	0.0
1517.1	1517	696.70	1518	690.56	400.50	1.50%	8	0.011	0.002	0.590	0.01	1.143	0.2	2.2
1518.1	1518	690.56	1477	684.68	299.00	2.00%	8	0.011	0.015	0.880	0.05	1.294	1.2	8.0
1519.1	1519	688.89	1520	684.51	339.10	1.30%	8	0.011	0.000	0.000	0.00	1.049	0.0	0.0
1520.1	1520	684.51	1478	678.51	341.00	1.80%	8	0.011	0.013	0.850	0.05	1.224	1.1	7.3
1521.1	1521	673.93	1479	669.75	299.70	1.40%	8	0.011	0.019	0.700	0.01	1.090	1.8	1.6

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1522.1	1522	677.55	1521	673.93	400.00	0.90%	8	0.011	0.000	0.000	0.00	0.878	0.0	0.0
1523.1	1523	705.26	1527	699.54	141.70	4.00%	8	0.011	0.002	0.540	0.01	1.855	0.1	0.8
1524.1	1524	690.38	1462	688.90	58.20	2.50%	8	0.011	0.006	0.660	0.02	1.471	0.4	3.3
1525.1	1525	696.17	1526	693.25	133.60	2.20%	8	0.011	0.002	0.540	0.01	1.365	0.1	0.8
1526.1	1526	693.25	1528	685.45	360.90	2.20%	8	0.011	0.005	0.690	0.59	1.357	0.4	88.0
1527.1	1527	699.54	1524	690.38	206.80	4.40%	8	0.011	0.006	0.650	0.02	1.943	0.3	2.9
1528.1	1528	685.45	1463	684.90	49.40	1.10%	8	0.011	0.005	0.620	0.02	0.974	0.6	2.5
1529.1	1529	689.47	1530	684.41	347.20	1.50%	8	0.011	0.013	0.780	0.04	1.114	1.1	5.4
1530.1	1530	684.41	1531	675.89	141.70	6.00%	8	0.011	0.013	0.770	0.03	2.264	0.6	5.2
1531.1	1531	675.89	1532	675.32	73.40	0.80%	8	0.011	0.015	0.920	0.06	0.813	1.9	9.0
1532.1	1532	675.32	1464	673.00	272.00	0.90%	8	0.011	0.039	0.870	0.25	0.852	4.6	36.8
1533.1	1533	677.50	1534	675.82	279.50	0.60%	8	0.011	0.010	0.810	0.22	0.716	1.3	32.3
1534.1	1534	675.82	1532	675.32	116.80	0.40%	8	0.011	0.022	0.980	0.10	0.604	3.6	15.6
1535.1	1535	679.12	1533	677.50	283.80	0.60%	8	0.011	0.000	0.000	0.16	0.697	0.0	24.3
1536.1	1536	717.15	2203	716.12	259.20	0.40%	8	0.011	0.023	0.890	0.22	0.582	4.0	32.7
1537.1	1537	720.11	1536	717.15	158.10	1.90%	8	0.011	0.015	0.900	0.06	1.263	1.2	8.5
1538.1	1538	712.50	2202	710.71	364.00	0.50%	8	0.011	0.037	1.110	0.26	0.647	5.7	39.7
1539.1	1539	708.62	1540	707.66	175.80	0.50%	8	0.011	0.038	1.140	0.14	0.682	5.5	20.3
1540.1	1540	707.66	1541	703.21	289.40	1.50%	8	0.011	0.109	2.110	0.60	1.145	9.5	89.7
1541.1	1541	703.21	1542	701.47	329.20	0.50%	8	0.011	0.109	1.920	0.20	0.671	16.3	30.0
1542.1	1542	701.47	1543	699.93	243.80	0.60%	8	0.011	0.110	2.040	0.19	0.734	15.0	28.8
1543.1	1543	699.93	2201	697.76	414.30	0.50%	12	0.011	0.111	1.830	0.18	1.969	5.6	17.7
1544.1	1544	693.43	1545	691.75	348.10	0.50%	12	0.011	0.467	2.980	0.47	1.891	24.7	46.7
1545.1	1545	691.75	1564	690.15	254.30	0.60%	12	0.011	0.468	3.280	0.48	2.159	21.7	48.4
1546.1	1546	721.94	1547	716.93	266.90	1.90%	8	0.011	0.011	0.790	0.54	1.265	0.9	81.2
1547.1	1547	716.93	1548	716.26	115.50	0.60%	8	0.011	0.022	1.120	0.10	0.703	3.2	14.4
1548.1	1548	716.26	1551	714.94	243.50	0.50%	8	0.011	0.042	1.200	0.14	0.680	6.1	21.1
1549.1	1549	711.77	1552	710.82	172.20	0.60%	8	0.011	0.155	2.210	0.23	0.686	22.6	34.9
1550.1	1550	712.77	1549	711.77	178.70	0.60%	8	0.011	0.105	1.890	0.20	0.691	15.2	29.4
1551.1	1551	714.94	1550	712.77	414.10	0.50%	8	0.011	0.048	1.300	0.15	0.668	7.2	21.9
1552.1	1552	710.82	1554	709.17	309.00	0.50%	8	0.011	0.172	2.290	0.24	0.674	25.5	36.7
1553.1	1553	707.77	1555	702.32	345.80	1.60%	8	0.011	0.214	3.180	0.20	1.159	18.5	30.6
1554.1	1554	709.17	1553	707.77	259.40	0.50%	8	0.011	0.195	2.400	0.40	0.678	28.8	59.9
1555.1	1555	702.32	1544	693.43	68.00	13.10%	8	0.011	0.245	3.030	0.13	3.338	7.3	18.9
1556.1	1556	712.98	1557	710.85	270.00	0.80%	8	0.011	0.000	0.000	0.21	0.820	0.0	32.0
1557.1	1557	710.85	1558	708.40	314.30	0.80%	8	0.011	0.000	0.000	0.00	0.815	0.0	0.0
1558.1	1558	708.40	1541	703.21	115.80	4.50%	8	0.011	0.000	0.000	0.00	1.954	0.0	0.0
1559.1	1559	678.43	2071	677.90	47.50	1.10%	21	0.011	5.932	8.060	0.84	12.788	46.4	47.9
1560.1	1560	680.92	1559	678.43	147.50	1.70%	12	0.011	0.472	4.680	0.25	3.536	13.4	25.3
1561.1	1561	684.43	1560	680.92	170.40	2.10%	12	0.011	0.472	5.030	0.24	3.905	12.1	24.0

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1562.1	1562	687.10	1561	684.43	256.90	1.00%	12	0.011	0.471	3.940	0.55	2.774	17.0	55.2
1563.1	1563	689.05	1562	687.10	247.10	0.80%	12	0.011	0.470	3.560	0.31	2.417	19.4	30.6
1564.1	1564	690.15	1563	689.05	245.60	0.40%	12	0.011	0.469	2.900	0.36	1.821	25.8	35.5
1565.1	1565	777.12	1566	775.77	311.60	0.40%	8	0.012	0.006	0.770	0.04	0.557	1.2	6.7
1566.1	1566	775.77	1582	770.22	168.40	3.30%	8	0.012	0.040	0.920	0.16	1.536	2.6	24.6
1567.1	1567	777.12	1568	771.69	432.40	1.30%	8	0.012	0.005	0.630	0.02	0.948	0.5	2.6
1568.1	1568	771.69	1582	770.22	403.10	0.40%	8	0.012	0.128	1.680	0.25	0.511	25.1	37.2
1569.1	1569	777.59	1570	776.28	301.60	0.40%	8	0.012	0.004	0.710	0.04	0.558	0.8	5.3
1570.1	1570	776.28	1571	775.76	106.20	0.50%	8	0.012	0.018	1.020	0.09	0.592	3.1	13.4
1571.1	1571	775.76	1572	772.54	28.80	11.20%	8	0.012	0.019	0.870	0.04	2.831	0.7	6.7
1572.1	1572	772.54	1568	771.69	221.30	0.40%	8	0.012	0.108	1.610	0.22	0.524	20.6	33.7
1573.1	1573	786.51	1574	773.78	402.20	3.20%	8	0.012	0.004	0.600	0.01	1.505	0.3	1.9
1574.1	1574	773.78	1572	772.54	336.70	0.40%	8	0.012	0.089	1.440	0.21	0.513	17.3	31.8
1575.1	1575	788.06	1576	782.82	262.10	2.00%	8	0.012	0.005	0.630	0.54	1.196	0.4	81.3
1576.1	1576	782.82	1577	774.37	192.60	4.40%	8	0.012	0.018	0.930	0.06	1.772	1.0	8.6
1577.1	1577	774.37	1574	773.78	142.70	0.40%	8	0.012	0.070	1.370	0.19	0.544	12.9	27.9
1578.1	1578	785.47	1579	776.25	280.30	3.30%	8	0.012	0.012	0.760	0.67	1.535	0.8	100.0
1579.1	1579	776.25	1580	775.51	188.80	0.40%	8	0.012	0.052	1.170	0.17	0.530	9.8	25.0
1580.1	1580	775.51	1577	774.37	307.30	0.40%	8	0.012	0.052	1.120	0.17	0.515	10.1	25.9
1581.1	1581	777.02	1579	776.25	196.70	0.40%	8	0.012	0.028	0.880	0.13	0.529	5.4	20.1
1582.1	1582	770.22	1738	769.67	131.60	0.40%	8	0.012	0.188	2.020	0.29	0.547	34.3	43.1
1583.1	1583	666.00	393	662.46	503.90	0.70%	8	0.012	0.004	0.640	0.02	0.709	0.6	3.3
1584.1	1584	803.68	2326	799.69	197.50	2.00%	8	0.012	0.041	1.330	0.10	1.203	3.4	15.3
1585.1	1585	796.34	1586	768.98	124.30	22.00%	8	0.012	0.067	1.380	0.07	3.969	1.7	10.9
1586.1	1586	768.98	527	764.66	13.60	31.80%	8	0.012	0.073	1.420	0.07	4.774	1.5	10.7
1587.1	1587	729.99	1590	729.55	77.20	0.60%	8	0.012	0.183	2.240	0.26	0.639	28.6	39.0
1588.1	1588	727.30	2117	726.18	261.60	0.40%	12	0.012	1.092	3.390	0.72	1.632	66.9	71.7
1589.1	1589	759.51	528	758.33	317.10	0.40%	8	0.012	0.004	0.650	0.03	0.516	0.7	3.8
1590.1	1590	729.55	549	728.76	180.80	0.40%	10	0.012	0.249	2.230	0.29	1.014	24.5	35.3
1591.1	1591	765.00	1592	757.70	260.90	2.80%	8	0.012	0.003	0.600	0.67	1.415	0.2	100.0
1592.1	1592	757.70	1593	745.25	479.60	2.60%	8	0.012	0.012	0.800	0.67	1.363	0.9	100.0
1593.1	1593	745.25	1594	737.88	500.00	1.50%	8	0.012	0.034	1.290	0.11	1.027	3.3	16.0
1594.1	1594	737.88	1590	729.55	154.90	5.40%	8	0.012	0.058	1.400	0.09	1.962	2.9	13.6
1595.1	1595	755.96	1596	750.87	333.10	1.50%	10	0.012	0.296	3.730	0.23	1.896	15.6	27.7
1596.1	1596	750.87	1597	746.45	357.70	1.20%	10	0.012	0.303	3.480	0.56	1.705	17.8	67.4
1597.1	1597	746.45	1598	744.53	138.40	1.40%	10	0.012	0.309	3.650	0.24	1.807	17.1	28.9
1598.1	1598	744.53	1599	742.12	118.30	2.00%	10	0.012	0.312	4.010	0.22	2.189	14.2	26.3
1599.1	1599	742.12	1600	737.31	235.10	2.00%	10	0.012	0.337	4.240	0.23	2.194	15.3	27.3
1600.1	1600	737.31	1601	736.00	240.60	0.50%	10	0.012	0.344	2.700	0.33	1.132	30.4	39.0
1601.1	1601	736.00	1613	734.57	190.70	0.70%	10	0.012	0.405	3.200	0.32	1.328	30.5	38.8

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1602.1	1602	747.43	1603	745.01	289.20	0.80%	8	0.012	0.002	0.540	0.25	0.774	0.2	37.1
1603.1	1603	745.01	1599	742.12	361.20	0.80%	8	0.012	0.011	0.830	0.25	0.757	1.5	38.2
1604.1	1604	746.67	1606	740.79	222.00	2.60%	8	0.012	0.002	0.540	0.01	1.377	0.1	0.8
1605.1	1605	741.12	1606	740.79	69.10	0.50%	8	0.012	0.001	0.530	0.00	0.585	0.2	0.7
1606.1	1606	740.79	1607	739.77	282.70	0.40%	8	0.012	0.009	0.850	0.16	0.508	1.7	24.5
1607.1	1607	739.77	1608	738.89	234.90	0.40%	8	0.012	0.018	1.060	0.09	0.518	3.6	13.0
1608.1	1608	738.89	1609	738.59	58.60	0.50%	8	0.012	0.028	0.910	0.13	0.605	4.6	19.2
1609.1	1609	738.59	1611	737.84	230.50	0.30%	8	0.012	0.030	0.840	0.14	0.483	6.2	21.4
1610.1	1610	738.82	1611	737.84	176.80	0.60%	8	0.012	0.003	0.610	0.02	0.630	0.5	2.7
1611.1	1611	737.84	1612	737.46	55.60	0.70%	8	0.012	0.041	1.240	0.14	0.699	5.9	20.4
1612.1	1612	737.46	1601	736.00	273.40	0.50%	8	0.012	0.043	1.420	0.27	0.618	7.0	41.1
1613.1	1613	734.57	1614	732.92	156.50	1.10%	10	0.012	0.409	3.630	0.30	1.575	25.9	35.6
1614.1	1614	732.92	1615	731.78	113.70	1.00%	10	0.012	0.411	3.570	0.30	1.536	26.8	36.2
1615.1	1615	731.78	1588	727.30	501.00	0.90%	10	0.012	0.844	4.180	0.46	1.451	58.2	55.7
1616.1	1616	739.40	1615	731.78	499.90	1.50%	10	0.012	0.432	4.520	0.26	1.894	22.8	31.6
1617.1	1617	748.20	1616	739.40	529.30	1.70%	10	0.012	0.431	4.320	0.27	1.978	21.8	32.6
1618.1	1618	731.58	1588	727.30	255.70	1.70%	10	0.012	0.002	0.570	0.44	1.985	0.1	52.6
1619.1	1619	727.53	2117	726.18	25.90	5.20%	8	0.012	0.116	2.000	0.12	1.930	6.0	18.0
1620.1	1620	728.10	1619	727.53	94.20	0.60%	8	0.012	0.116	1.930	0.21	0.658	17.6	31.1
1621.1	1621	728.29	1620	728.10	18.90	1.00%	8	0.012	0.116	2.310	0.18	0.849	13.6	27.3
1622.1	1622	731.38	1621	728.29	373.50	0.80%	8	0.012	0.096	2.000	0.40	0.770	12.4	59.6
1623.1	1623	732.87	1622	731.38	278.80	0.50%	8	0.012	0.069	1.470	0.32	0.619	11.1	48.4
1624.1	1624	734.33	1623	732.87	271.80	0.50%	8	0.012	0.050	1.260	0.30	0.620	8.0	45.0
1625.1	1625	735.32	1624	734.33	269.70	0.40%	8	0.012	0.033	0.860	0.25	0.513	6.4	37.2
1626.1	1626	735.99	1625	735.32	172.50	0.40%	8	0.012	0.003	0.590	0.01	0.527	0.6	2.1
1627.1	1627	737.14	1625	735.32	521.70	0.30%	8	0.012	0.012	0.920	0.07	0.500	2.3	10.5
1628.1	1628	739.22	1627	737.14	263.40	0.80%	8	0.012	0.001	0.530	0.21	0.752	0.2	31.9
1629.1	1629	735.42	1624	734.33	301.50	0.40%	8	0.012	0.003	0.550	0.01	0.509	0.5	0.9
1630.1	1630	735.44	1623	732.87	308.20	0.80%	8	0.012	0.003	0.590	0.01	0.773	0.4	2.0
1631.1	1631	733.92	1622	731.38	488.60	0.50%	8	0.012	0.002	0.540	0.15	0.610	0.2	21.9
1632.1	1632	732.70	1621	728.29	263.80	1.70%	8	0.012	0.004	0.560	0.45	1.094	0.3	67.1
1633.1	1633	756.40	1595	755.96	168.50	0.30%	10	0.012	0.295	1.980	0.37	0.784	37.6	43.8
1634.1	1634	756.49	1633	756.40	25.20	0.40%	8	0.012	0.044	0.400	0.33	0.505	8.8	49.8
1635.1	1635	760.40	1657	757.10	98.60	3.30%	8	0.012	0.001	0.530	0.00	1.548	0.1	0.6
1636.1	1636	755.00	1638	751.43	56.40	6.30%	8	0.012	0.003	0.570	0.01	2.129	0.1	1.5
1637.1	1637	752.50	1639	751.10	240.90	0.60%	8	0.012	0.003	0.620	0.02	0.645	0.5	2.8
1638.1	1638	751.43	1639	751.10	45.40	0.70%	8	0.012	0.006	0.680	0.03	0.721	0.8	4.2
1639.1	1639	751.10	1042	739.84	423.90	2.70%	8	0.012	0.019	0.960	0.06	1.379	1.4	9.4
1640.1	1640	745.60	1646	732.92	351.40	3.60%	8	0.012	0.019	0.940	0.67	1.607	1.2	100.0
1641.1	1641	749.40	1640	745.60	380.10	1.00%	8	0.012	0.003	0.590	0.28	0.846	0.4	42.6

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1642.1	1642	748.77	1047	743.51	148.30	3.50%	8	0.012	0.000	0.000	0.00	1.594	0.0	0.0
1643.1	1643	730.04	1058	726.23	211.80	1.80%	8	0.012	0.046	1.410	0.11	1.135	4.1	16.5
1644.1	1644	731.25	1643	730.04	292.50	0.40%	8	0.012	0.036	0.950	0.27	0.544	6.5	40.4
1645.1	1645	732.20	1647	731.79	78.60	0.50%	8	0.012	0.033	0.990	0.14	0.611	5.3	20.3
1646.1	1646	732.92	1645	732.20	192.30	0.40%	8	0.012	0.028	0.860	0.13	0.518	5.3	19.9
1647.1	1647	731.79	1644	731.25	112.00	0.50%	8	0.012	0.034	0.990	0.14	0.588	5.8	20.8
1648.1	1648	756.29	1009	738.36	331.70	5.40%	8	0.012	0.032	1.120	0.08	1.967	1.6	11.3
1649.1	1649	733.04	1059	724.55	344.00	2.50%	8	0.012	0.002	0.540	0.00	1.329	0.1	0.7
1650.1	1650	711.15	1004	709.38	359.40	0.50%	8	0.012	0.068	0.300	0.67	0.594	11.5	100.0
1651.1	1651	763.80	1656	758.17	366.10	1.50%	8	0.011	0.003	0.600	0.42	1.145	0.2	62.9
1652.1	1652	772.23	1653	767.28	240.70	2.10%	8	0.011	0.003	0.580	0.01	1.324	0.2	1.6
1653.1	1653	767.28	1654	764.57	104.50	2.60%	8	0.011	0.010	0.770	0.04	1.486	0.6	5.9
1654.1	1654	764.57	1655	763.08	56.80	2.60%	8	0.011	0.011	0.800	0.04	1.495	0.7	6.3
1655.1	1655	763.08	1656	758.17	187.80	2.60%	8	0.011	0.011	0.800	0.04	1.492	0.7	6.5
1656.1	1656	758.17	1648	756.29	113.20	1.70%	8	0.012	0.027	1.100	0.08	1.090	2.5	11.7
1657.1	1657	757.10	1634	756.49	65.60	0.90%	8	0.012	0.044	1.390	0.13	0.816	5.3	19.6
1658.1	1658	758.27	1657	757.10	123.50	0.90%	8	0.011	0.039	1.390	0.12	0.899	4.3	17.6
1659.1	1659	760.49	1658	758.27	87.50	2.50%	8	0.011	0.025	1.070	0.07	1.470	1.7	11.2
1660.1	1660	761.55	1659	760.49	131.20	0.80%	8	0.011	0.022	1.080	0.08	0.830	2.7	12.4
1661.1	1661	766.30	1660	761.55	189.80	2.50%	8	0.011	0.002	0.550	0.01	1.460	0.1	0.9
1662.1	1662	767.43	1663	764.59	147.20	1.90%	8	0.011	0.002	0.570	0.01	1.282	0.2	1.5
1663.1	1663	764.59	1660	761.55	146.40	2.10%	8	0.011	0.014	0.860	0.05	1.330	1.0	7.7
1664.1	1664	767.85	1663	764.59	158.10	2.10%	8	0.011	0.004	0.670	0.03	1.326	0.3	4.1
1665.1	1665	759.84	1666	758.88	215.80	0.40%	8	0.011	0.002	0.540	0.01	0.616	0.3	0.8
1666.1	1666	758.88	1658	758.27	154.50	0.40%	8	0.011	0.009	0.790	0.05	0.580	1.5	6.9
1667.1	1667	795.34	1668	788.40	132.00	5.30%	8	0.012	0.000	0.350	0.00	1.940	0.0	0.4
1668.1	1668	788.40	1669	785.36	58.20	5.20%	8	0.012	0.007	0.650	0.02	1.934	0.3	3.0
1669.1	1669	785.36	1670	782.04	51.80	6.40%	8	0.012	0.008	0.690	0.02	2.141	0.4	3.7
1670.1	1670	782.04	1680	775.25	154.80	4.40%	8	0.012	0.011	0.730	0.03	1.772	0.6	4.4
1671.1	1671	798.71	1672	785.86	275.20	4.70%	8	0.012	0.004	0.600	0.67	1.828	0.2	100.0
1672.1	1672	785.86	1679	776.85	207.70	4.30%	8	0.012	0.013	0.850	0.05	1.762	0.8	7.4
1673.1	1673	814.15	1983	809.88	138.90	3.10%	8	0.012	0.003	0.560	0.01	1.484	0.2	1.2
1674.1	1674	799.03	1677	790.66	230.70	3.60%	8	0.012	0.021	0.970	0.06	1.611	1.3	9.4
1675.1	1675	791.65	1676	791.14	126.20	0.40%	8	0.012	0.054	1.190	0.17	0.538	10.0	25.4
1676.1	1676	791.14	1677	790.66	70.80	0.70%	8	0.012	0.056	1.450	0.15	0.697	8.0	22.6
1677.1	1677	790.66	1678	783.02	252.10	3.00%	8	0.012	0.078	1.700	0.67	1.473	5.3	100.0
1678.1	1678	783.02	1679	776.85	207.00	3.00%	8	0.012	0.089	1.800	0.12	1.461	6.1	18.5
1679.1	1679	776.85	1680	775.25	296.50	0.50%	8	0.012	0.111	1.830	0.37	0.622	17.9	55.5
1680.1	1680	775.25	1681	773.90	379.20	0.40%	8	0.012	0.132	1.680	0.35	0.505	26.1	52.4
1681.1	1681	773.90	1699	772.59	64.50	2.00%	8	0.012	0.142	2.430	0.17	1.206	11.8	25.0

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1682.1	1682	761.80	1684	750.54	359.10	3.10%	8	0.012	0.048	1.360	0.67	1.498	3.2	100.0
1683.1	1683	764.02	1682	761.80	423.70	0.50%	8	0.012	0.003	0.600	0.02	0.612	0.4	2.4
1684.1	1684	750.54	1695	749.57	278.10	0.30%	8	0.012	0.567	2.510	0.67	0.500	113.5	100.0
1685.1	1685	750.94	1684	750.54	111.60	0.40%	8	0.012	0.516	2.290	0.67	0.506	101.8	100.0
1686.1	1686	770.62	1682	761.80	224.20	3.90%	8	0.012	0.020	0.960	0.06	1.678	1.2	9.1
1687.1	1687	783.57	1688	773.61	179.50	5.50%	8	0.012	0.002	0.540	0.01	1.993	0.1	0.8
1688.1	1688	773.61	1686	770.62	286.90	1.00%	8	0.012	0.020	1.040	0.38	0.864	2.3	56.5
1689.1	1689	774.18	1688	773.61	116.40	0.50%	8	0.012	0.001	0.530	0.00	0.592	0.2	0.6
1690.1	1690	752.13	1685	750.94	255.90	0.50%	8	0.012	0.371	1.770	0.67	0.577	64.3	100.0
1691.1	1691	759.23	1685	750.94	291.80	2.80%	8	0.012	0.060	1.040	0.67	1.426	4.2	100.0
1692.1	1692	765.66	1691	759.23	359.20	1.80%	8	0.012	0.003	0.610	0.48	1.132	0.3	71.4
1693.1	1693	753.55	1690	752.13	378.00	0.40%	8	0.012	0.367	2.370	0.53	0.519	70.7	79.9
1694.1	1694	755.39	1693	753.55	496.90	0.40%	8	0.012	0.365	2.360	0.53	0.515	70.8	80.1
1695.1	1695	749.57	1016	748.65	232.20	0.40%	8	0.012	0.576	2.550	0.67	0.533	108.2	100.0
1696.1	1696	764.27	1698	763.77	164.60	0.30%	10	0.012	0.001	0.230	0.03	0.846	0.1	3.1
1697.1	1697	764.22	1698	763.77	95.50	0.50%	8	0.012	0.002	0.270	0.05	0.581	0.4	7.6
1698.1	1698	763.77	1700	762.94	291.30	0.30%	10	0.012	0.170	1.670	0.36	0.819	20.7	42.9
1699.1	1699	772.59	1698	763.77	320.00	2.80%	8	0.012	0.147	2.420	0.16	1.405	10.4	23.5
1700.1	1700	762.94	1701	762.42	166.70	0.30%	10	0.012	0.184	1.780	0.28	0.857	21.5	33.5
1701.1	1701	762.42	1707	761.90	170.40	0.30%	10	0.012	0.191	1.790	0.28	0.847	22.5	34.2
1702.1	1702	776.80	1708	765.70	366.10	3.00%	8	0.012	0.002	0.540	0.67	1.473	0.1	100.0
1703.1	1703	760.00	2123	756.79	440.70	0.70%	10	0.012	0.241	2.650	0.25	1.309	18.4	30.4
1704.1	1704	771.50	1705	760.49	187.00	5.90%	8	0.012	0.004	0.590	0.01	2.053	0.2	1.9
1705.1	1705	760.49	1703	760.00	196.20	0.20%	10	0.012	0.241	1.810	0.34	0.767	31.4	40.3
1706.1	1706	761.05	1705	760.49	226.90	0.20%	10	0.012	0.223	1.750	0.32	0.762	29.2	39.0
1707.1	1707	761.90	1706	761.05	296.70	0.30%	10	0.012	0.208	1.800	0.39	0.821	25.4	46.5
1708.1	1708	765.70	1707	761.90	148.80	2.60%	8	0.012	0.012	0.830	0.05	1.352	0.9	7.0
1709.1	1709	821.25	1710	819.73	35.10	4.30%	8	0.012	0.002	0.550	0.01	1.760	0.1	1.1
1710.1	1710	819.73	1711	816.07	93.70	3.90%	8	0.012	0.003	0.580	0.01	1.672	0.2	1.6
1711.1	1711	816.07	1712	812.67	123.30	2.80%	8	0.012	0.006	0.710	0.03	1.405	0.5	4.9
1712.1	1712	812.67	1716	803.41	277.60	3.30%	8	0.012	0.016	0.860	0.67	1.545	1.1	100.0
1713.1	1713	814.73	1712	812.67	55.80	3.70%	8	0.012	0.006	0.630	0.02	1.625	0.4	2.4
1714.1	1714	812.48	1715	808.30	136.00	3.10%	8	0.012	0.002	0.540	0.00	1.483	0.1	0.7
1715.1	1715	808.30	1716	803.41	136.90	3.60%	8	0.012	0.004	0.580	0.01	1.599	0.2	1.6
1716.1	1716	803.41	1717	794.83	327.40	2.60%	8	0.012	0.031	1.200	0.09	1.370	2.3	13.7
1717.1	1717	794.83	1721	793.05	175.70	1.00%	8	0.012	0.043	1.450	0.12	0.852	5.1	18.6
1718.1	1718	797.49	1717	794.83	85.30	3.10%	8	0.012	0.002	0.550	0.01	1.494	0.1	0.9
1719.1	1719	792.47	1675	791.65	188.50	0.40%	8	0.012	0.051	1.210	0.16	0.558	9.2	24.3
1720.1	1720	792.78	1719	792.47	62.90	0.50%	8	0.012	0.051	1.240	0.16	0.594	8.6	23.8
1721.1	1721	793.05	1720	792.78	52.30	0.50%	8	0.012	0.050	1.250	0.16	0.608	8.2	23.3

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1722.1	1722	793.58	1721	793.05	75.20	0.70%	8	0.012	0.002	0.560	0.01	0.711	0.3	1.5
1723.1	1723	789.92	1724	786.77	122.40	2.60%	8	0.012	0.002	0.540	0.00	1.357	0.1	0.7
1724.1	1724	786.77	1728	782.22	147.80	3.10%	8	0.012	0.006	0.640	0.02	1.485	0.4	2.9
1725.1	1725	786.81	1724	786.77	72.30	0.10%	8	0.012	0.001	0.530	0.00	0.199	0.4	0.6
1726.1	1726	788.06	1730	776.85	335.20	3.30%	8	0.012	0.004	0.610	0.02	1.547	0.2	2.4
1727.1	1727	789.34	1726	788.06	91.30	1.40%	8	0.012	0.002	0.550	0.01	1.002	0.2	1.0
1728.1	1728	782.22	1729	777.71	160.40	2.80%	8	0.012	0.011	0.800	0.04	1.419	0.8	6.5
1729.1	1729	777.71	1737	773.96	134.30	2.80%	8	0.011	0.017	0.900	0.05	1.542	1.1	8.2
1730.1	1730	776.85	1732	771.82	169.90	3.00%	8	0.011	0.011	0.810	0.04	1.588	0.7	6.6
1731.1	1731	771.20	1733	765.36	189.40	3.10%	8	0.011	0.023	1.010	0.07	1.621	1.4	10.1
1732.1	1732	771.82	1735	770.51	41.00	3.20%	8	0.011	0.018	0.920	0.06	1.650	1.1	8.5
1733.1	1733	765.36	1736	762.09	125.50	2.60%	8	0.012	0.050	1.400	0.10	1.366	3.7	15.4
1734.1	1734	766.38	1733	765.36	29.00	3.50%	8	0.011	0.023	1.010	0.07	1.730	1.3	10.0
1735.1	1735	770.51	1734	766.38	138.60	3.00%	8	0.011	0.018	0.930	0.06	1.593	1.1	8.7
1736.1	1736	762.09	1694	755.39	336.40	2.00%	8	0.012	0.241	3.430	0.21	1.194	20.2	31.9
1737.1	1737	773.96	1731	771.20	96.20	2.90%	8	0.011	0.020	0.960	0.06	1.564	1.3	9.2
1738.1	1738	769.67	1736	762.09	299.00	2.50%	8	0.012	0.190	2.860	0.18	1.347	14.1	26.8
1739.1	1739	784.67	1740	783.72	103.90	0.90%	8	0.011	0.003	0.560	0.01	0.883	0.3	1.2
1740.1	1740	783.72	1741	782.71	113.80	0.90%	8	0.011	0.005	0.630	0.02	0.870	0.6	2.7
1741.1	1741	782.71	1751	769.20	242.80	5.60%	8	0.011	0.008	0.680	0.02	2.177	0.4	3.6
1742.1	1742	790.56	1743	787.62	282.20	1.00%	8	0.011	0.004	0.570	0.30	0.942	0.4	45.3
1743.1	1743	787.62	1746	786.85	166.70	0.50%	8	0.011	0.018	1.060	0.08	0.627	2.9	12.7
1744.1	1744	787.96	1743	787.62	61.90	0.50%	8	0.011	0.004	0.630	0.02	0.684	0.5	3.0
1745.1	1745	788.38	1744	787.96	88.50	0.50%	8	0.011	0.001	0.530	0.00	0.636	0.2	0.7
1746.1	1746	786.85	1747	786.32	111.70	0.50%	8	0.011	0.018	1.060	0.09	0.636	2.8	12.8
1747.1	1747	786.32	1748	778.00	210.10	4.00%	8	0.011	0.040	1.230	0.08	1.837	2.2	12.6
1748.1	1748	778.00	1749	771.22	253.90	2.70%	8	0.011	0.057	1.460	0.67	1.508	3.7	100.0
1749.1	1749	771.22	1750	769.67	361.00	0.40%	8	0.011	0.657	3.200	0.67	0.605	108.7	100.0
1750.1	1750	769.67	1751	769.20	76.00	0.60%	8	0.011	0.464	3.620	0.37	0.726	64.0	55.4
1751.1	1751	769.20	2153	765.73	330.50	1.00%	8	0.011	0.380	3.950	0.29	0.946	40.2	44.2
1752.1	1752	780.76	1753	776.88	210.50	1.80%	8	0.011	0.002	0.540	0.01	1.253	0.1	0.8
1753.1	1753	776.88	1754	770.50	78.50	8.10%	8	0.011	0.006	0.620	0.02	2.631	0.2	2.4
1754.1	1754	770.50	1756	765.86	87.70	5.30%	8	0.011	0.016	0.820	0.04	2.123	0.7	6.0
1755.1	1755	772.92	1754	770.50	178.10	1.40%	8	0.011	0.004	0.580	0.01	1.076	0.3	1.5
1756.1	1756	765.86	1757	765.76	287.70	0.00%	8	0.011	0.019	0.550	0.15	0.172	10.9	22.2
1757.1	1757	765.76	1758	764.46	364.70	0.40%	8	0.011	0.026	0.860	0.22	0.551	4.6	32.8
1758.1	1758	764.46	1759	763.58	236.40	0.40%	8	0.011	0.039	1.060	0.15	0.563	6.9	21.9
1759.1	1759	763.58	2152	761.61	539.00	0.40%	8	0.011	0.049	1.170	0.16	0.558	8.9	24.2
1760.1	1760	764.54	1761	760.09	417.90	1.10%	8	0.011	0.003	0.550	0.01	0.952	0.3	1.0
1761.1	1761	760.09	1763	757.62	297.00	0.80%	10	0.011	0.017	0.940	0.31	1.526	1.1	37.0

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1762.1	1762	762.54	1763	757.62	283.20	1.70%	8	0.011	0.002	0.550	0.50	1.217	0.2	74.6
1763.1	1763	757.62	1764	755.12	300.50	0.80%	10	0.011	0.030	1.150	0.11	1.526	2.0	12.7
1764.1	1764	755.12	1766	753.22	299.20	0.60%	10	0.011	0.046	1.320	0.13	1.334	3.4	15.5
1765.1	1765	761.60	1764	755.12	251.70	2.60%	8	0.011	0.003	0.580	0.66	1.481	0.2	99.1
1766.1	1766	753.22	2150	745.79	519.10	1.40%	10	0.011	0.062	1.560	0.12	2.002	3.1	14.1
1767.1	1767	754.21	1766	753.22	91.50	1.10%	8	0.011	0.010	0.750	0.03	0.960	1.1	5.1
1768.1	1768	754.75	1767	754.21	54.90	1.00%	8	0.011	0.008	0.690	0.03	0.915	0.8	4.1
1769.1	1769	755.39	1768	754.75	67.40	0.90%	8	0.011	0.005	0.610	0.02	0.899	0.5	2.3
1770.1	1770	756.18	1769	755.39	86.60	0.90%	8	0.011	0.002	0.540	0.01	0.882	0.2	0.8
1771.1	1771	771.98	1772	771.70	51.50	0.50%	8	0.011	0.002	0.540	0.00	0.681	0.2	0.7
1772.1	1772	771.70	1773	771.45	47.10	0.50%	8	0.011	0.004	0.650	0.02	0.672	0.6	3.5
1773.1	1773	771.45	2153	765.73	566.00	1.00%	8	0.011	0.006	0.650	0.28	0.928	0.6	42.0
1774.1	1774	762.50	1761	760.09	281.00	0.90%	10	0.011	0.000	0.000	0.24	1.550	0.0	28.9
1775.1	1775	710.44	2336	709.82	103.50	0.60%	8	0.011	0.031	1.080	0.12	0.714	4.4	18.5
1776.1	1776	778.63	2194	777.92	179.30	0.40%	8	0.012	0.022	0.950	0.11	0.532	4.1	15.8
1777.1	1777	779.65	1776	778.63	270.40	0.40%	6	0.012	0.000	0.000	0.10	0.241	0.0	20.4
1778.1	1778	608.20	1779	601.01	231.60	3.10%	8	0.011	0.019	0.950	0.06	1.626	1.2	9.0
1779.1	1779	601.01	1780	599.00	382.30	0.50%	8	0.011	0.033	1.060	0.27	0.669	4.9	41.1
1780.1	1780	599.00	LS_BCP4	592.92	130.90	4.60%	8	0.011	0.033	1.140	0.08	1.989	1.6	11.7
1781.1	1781	697.88	1782	697.08	161.30	0.50%	8	0.011	0.002	0.600	0.02	0.650	0.4	2.5
1782.1	1782	697.08	1783	695.34	269.80	0.60%	8	0.011	0.004	0.620	0.19	0.741	0.5	28.8
1783.1	1783	695.34	1784	694.66	116.50	0.60%	8	0.011	0.004	0.630	0.04	0.705	0.5	6.2
1784.1	1784	694.66	1789	693.98	158.90	0.40%	8	0.011	0.020	0.990	0.09	0.604	3.2	14.2
1785.1	1785	705.48	1786	704.00	405.20	0.40%	8	0.011	0.000	0.000	0.00	0.558	0.0	0.0
1786.1	1786	704.00	1787	702.40	302.80	0.50%	8	0.011	0.003	0.580	0.01	0.671	0.4	1.9
1787.1	1787	702.40	2107	697.19	496.10	1.10%	8	0.011	0.004	0.580	0.30	0.946	0.4	44.8
1788.1	1788	695.37	1784	694.66	100.40	0.70%	8	0.011	0.014	0.910	0.06	0.776	1.8	8.8
1789.1	1789	693.98	1790	691.27	261.00	1.00%	8	0.011	0.020	1.010	0.34	0.940	2.1	51.4
1790.1	1790	691.27	1791	685.53	280.50	2.00%	8	0.011	0.020	0.990	0.64	1.320	1.5	96.1
1791.1	1791	685.53	1794	684.55	188.60	0.50%	8	0.011	0.029	0.970	0.13	0.665	4.3	18.9
1792.1	1792	697.62	1793	694.83	251.70	1.10%	8	0.011	0.004	0.570	0.29	0.972	0.4	43.0
1793.1	1793	694.83	1791	685.53	237.90	3.90%	8	0.011	0.004	0.590	0.01	1.825	0.2	1.9
1794.1	1794	684.55	1795	684.12	82.80	0.50%	8	0.011	0.029	0.980	0.13	0.665	4.4	18.8
1795.1	1795	684.12	1797	683.35	132.00	0.60%	8	0.011	0.030	1.050	0.12	0.705	4.3	18.4
1796.1	1796	682.87	1798	677.56	341.30	1.60%	8	0.011	0.031	1.230	0.10	1.151	2.7	14.8
1797.1	1797	683.35	1796	682.87	75.60	0.60%	8	0.011	0.030	1.080	0.12	0.736	4.1	18.1
1798.1	1798	677.56	1799	669.24	132.00	6.30%	8	0.011	0.040	1.190	0.08	2.317	1.7	11.4
1799.1	1799	669.24	1807	668.84	195.90	0.20%	15	0.011	0.096	1.210	0.20	2.229	4.3	15.6
1800.1	1800	670.50	1799	669.24	403.40	0.30%	12	0.011	0.055	1.110	0.15	1.521	3.6	15.3
1801.1	1801	671.60	1800	670.50	399.70	0.30%	12	0.011	0.054	1.050	0.16	1.428	3.7	15.7

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1802.1	1802	672.70	1801	671.60	312.20	0.40%	12	0.011	0.047	1.070	0.14	1.615	2.9	14.2
1803.1	1803	673.14	1802	672.70	165.60	0.30%	12	0.011	0.047	0.970	0.15	1.403	3.3	15.0
1804.1	1804	674.47	1803	673.14	466.80	0.30%	12	0.011	0.042	0.940	0.22	1.453	2.9	21.8
1805.1	1805	675.01	1804	674.47	157.00	0.30%	12	0.011	0.042	1.000	0.14	1.596	2.6	13.6
1806.1	1806	684.49	1805	675.01	423.90	2.20%	8	0.011	0.013	0.840	0.05	1.380	0.9	7.2
1807.1	1807	668.84	28	667.87	455.70	0.20%	15	0.011	0.098	1.230	0.25	2.276	4.3	19.9
1808.1	1808	706.50	1809	698.37	396.30	2.10%	8	0.011	0.026	1.110	0.66	1.322	2.0	99.3
1809.1	1809	698.37	1810	697.33	187.50	0.60%	8	0.011	0.026	1.000	0.12	0.687	3.8	17.3
1810.1	1810	697.33	1813	692.90	243.90	1.80%	8	0.011	0.026	1.130	0.08	1.244	2.1	12.7
1811.1	1811	684.77	1999	683.87	122.10	0.70%	8	0.011	0.027	1.220	0.10	0.792	3.4	15.3
1812.1	1812	685.40	1811	684.77	119.70	0.50%	8	0.011	0.027	0.960	0.12	0.670	4.0	18.0
1813.1	1813	692.90	1812	685.40	239.80	3.10%	8	0.011	0.027	1.080	0.07	1.632	1.6	11.2
1814.1	1814	708.34	1815	706.51	347.60	0.50%	8	0.011	0.000	0.000	0.13	0.670	0.0	19.6
1815.1	1815	706.51	1786	704.00	457.70	0.50%	8	0.011	0.002	0.570	0.15	0.684	0.3	22.7
1816.1	1816	672.02	1817	671.04	175.20	0.60%	8	0.011	0.002	0.620	0.02	0.690	0.3	2.9
1817.1	1817	671.04	1818	669.62	264.20	0.50%	8	0.011	0.010	0.800	0.19	0.677	1.4	28.0
1818.1	1818	669.62	1819	668.07	290.10	0.50%	8	0.011	0.024	1.100	0.26	0.675	3.5	38.3
1819.1	1819	668.07	1820	666.52	289.00	0.50%	8	0.011	0.030	1.020	0.28	0.676	4.4	42.0
1820.1	1820	666.52	1821	664.97	290.60	0.50%	8	0.011	0.036	1.140	0.29	0.674	5.3	42.9
1821.1	1821	664.97	1823	663.44	287.50	0.50%	8	0.011	0.046	1.430	0.27	0.673	6.8	40.1
1822.1	1822	665.65	1821	664.97	115.50	0.60%	8	0.011	0.000	0.000	0.00	0.708	0.0	0.0
1823.1	1823	663.44	1824	663.44	287.00	0.00%	8	0.011	0.057	0.540	0.32	0.000	Infinity	47.3
1824.1	1824	663.44	1825	660.83	193.30	1.30%	8	0.011	0.067	1.670	0.13	1.072	6.3	19.4
1825.1	1825	660.83	1826	660.45	76.40	0.50%	8	0.011	0.074	1.580	0.17	0.651	11.3	26.0
1826.1	1826	660.45	591	658.24	367.00	0.60%	8	0.011	0.078	1.690	0.33	0.716	10.8	49.3
1827.1	1827	670.28	1828	669.17	202.80	0.50%	8	0.011	0.005	0.670	0.03	0.683	0.7	3.9
1828.1	1828	669.17	1829	668.05	202.10	0.60%	8	0.011	0.012	0.920	0.07	0.687	1.8	9.8
1829.1	1829	668.05	1830	663.86	202.30	2.10%	8	0.011	0.021	1.000	0.07	1.328	1.5	10.2
1830.1	1830	663.86	598	663.04	143.90	0.60%	8	0.011	0.028	1.060	0.12	0.697	4.0	17.3
1831.1	1831	672.77	1832	670.63	406.10	0.50%	8	0.011	0.004	0.650	0.02	0.670	0.6	3.5
1832.1	1832	670.63	1833	669.42	224.00	0.50%	8	0.011	0.017	1.050	0.08	0.678	2.6	12.6
1833.1	1833	669.42	599	668.76	123.40	0.50%	8	0.011	0.026	1.010	0.11	0.675	3.9	17.2
1834.1	1834	674.96	1835	673.26	319.50	0.50%	8	0.011	0.002	0.560	0.01	0.673	0.4	1.4
1835.1	1835	673.26	601	671.23	139.10	1.50%	8	0.011	0.015	0.830	0.04	1.115	1.3	6.5
1836.1	1836	662.52	1837	660.16	181.00	1.30%	10	0.011	0.552	4.560	0.31	1.911	28.9	37.5
1837.1	1837	660.16	1842	654.96	439.40	1.20%	10	0.011	0.551	4.400	0.32	1.820	30.3	38.5
1838.1	1838	648.77	1839	647.53	173.00	0.70%	10	0.011	1.095	3.100	0.83	1.417	77.3	100.0
1839.1	1839	647.53	1840	645.67	342.20	0.50%	10	0.011	1.454	4.120	0.83	1.234	117.8	100.0
1840.1	1840	645.67	1841	645.43	46.70	0.50%	12	0.011	1.454	4.180	0.65	1.951	74.5	64.7
1841.1	1841	645.43	1422	644.14	276.40	0.50%	12	0.011	1.572	4.070	0.84	1.859	84.6	84.0

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1842.1	1842	654.96	1420	652.06	222.00	1.30%	10	0.011	0.560	3.950	0.35	1.913	29.3	42.3
1843.1	1843	711.94	1844	703.89	497.10	1.60%	10	0.011	1.610	6.560	0.83	2.130	75.6	100.0
1844.1	1844	703.89	982	688.02	518.30	3.10%	10	0.011	1.611	8.410	0.45	2.928	55.0	53.4
1845.1	1845	611.16	2195	610.09	107.30	1.00%	8	0.011	0.388	3.750	0.31	0.922	42.1	46.8
1846.1	1846	614.54	1845	611.16	269.80	1.30%	8	0.012	0.388	3.820	0.65	0.947	40.9	96.8
1847.1	1847	615.68	1846	614.54	235.60	0.50%	8	0.012	0.387	2.660	0.41	0.589	65.8	61.4
1848.1	1848	616.57	1847	615.68	135.50	0.70%	8	0.012	0.387	3.000	0.37	0.686	56.4	55.7
1849.1	1849	624.02	1848	616.57	369.20	2.00%	8	0.012	0.386	4.530	0.67	1.202	32.1	100.0
1850.1	1850	626.59	1849	624.02	494.80	0.50%	8	0.012	0.313	2.580	0.50	0.610	51.3	74.3
1851.1	1851	627.24	1850	626.59	110.30	0.60%	8	0.012	0.308	2.690	0.34	0.650	47.4	50.5
1852.1	1852	630.98	1851	627.24	182.20	2.10%	8	0.012	0.303	4.020	0.24	1.212	25.0	35.4
1853.1	1853	636.28	1852	630.98	259.90	2.00%	8	0.012	0.283	3.830	0.67	1.208	23.4	100.0
1854.1	1854	638.98	1853	636.28	259.70	1.00%	8	0.012	0.263	3.160	0.53	0.863	30.5	80.2
1855.1	1855	642.59	1854	638.98	350.20	1.00%	8	0.012	0.082	1.940	0.42	0.859	9.5	62.8
1856.1	1856	644.38	1855	642.59	169.20	1.10%	6	0.012	0.074	1.900	0.17	0.404	18.2	33.2
1857.1	1857	653.48	1856	644.38	497.90	1.80%	6	0.012	0.051	1.530	0.13	0.531	9.6	25.2
1858.1	1858	665.99	1857	653.48	502.10	2.50%	6	0.012	0.029	1.220	0.10	0.620	4.7	19.7
1859.1	1859	676.17	1858	665.99	336.00	3.00%	6	0.012	0.015	0.900	0.06	0.684	2.2	11.3
1860.1	1860	681.49	1859	676.17	170.60	3.10%	6	0.012	0.006	0.640	0.02	0.694	0.8	3.9
1861.1	1861	634.42	1849	624.02	89.20	11.70%	6	0.012	0.049	1.260	0.08	1.342	3.6	15.4
1862.1	1862	644.30	1861	634.42	330.00	3.00%	6	0.012	0.035	1.270	0.10	0.680	5.2	19.9
1863.1	1863	657.14	1862	644.30	364.80	3.50%	6	0.012	0.022	1.000	0.50	0.737	3.0	100.0
1864.1	1864	664.18	1863	657.14	558.30	1.30%	6	0.012	0.002	0.540	0.33	0.441	0.4	65.0
1865.1	1865	648.25	1881	646.99	48.30	2.60%	6	0.012	0.002	0.240	0.06	0.634	0.3	11.4
1866.1	1866	643.19	1853	636.28	375.50	1.80%	6	0.012	0.003	0.600	0.50	0.533	0.6	100.0
1867.1	1867	634.84	1852	630.98	374.30	1.00%	6	0.012	0.003	0.620	0.29	0.399	0.8	58.9
1868.1	1868	649.81	1881	646.99	542.10	0.50%	6	0.012	0.137	1.980	0.27	0.283	48.4	53.7
1869.1	1869	651.05	1868	649.81	229.00	0.50%	6	0.012	0.129	1.970	0.26	0.289	44.5	51.0
1870.1	1870	658.17	1869	651.05	292.00	2.40%	6	0.012	0.107	2.090	0.50	0.613	17.4	100.0
1871.1	1871	665.29	1870	658.17	293.00	2.40%	6	0.012	0.081	1.820	0.50	0.612	13.3	100.0
1872.1	1872	672.40	1871	665.29	292.00	2.40%	6	0.012	0.055	1.530	0.50	0.613	9.0	100.0
1873.1	1873	673.74	1872	672.40	82.30	1.60%	6	0.012	0.032	1.310	0.11	0.501	6.4	22.3
1874.1	1874	676.96	1873	673.74	208.30	1.50%	6	0.012	0.028	1.250	0.11	0.488	5.6	21.3
1875.1	1875	680.67	1874	676.96	449.90	0.80%	6	0.012	0.009	0.830	0.26	0.357	2.6	51.7
1876.1	1876	679.07	1872	672.40	436.70	1.50%	6	0.012	0.009	0.760	0.04	0.486	1.8	7.7
1877.1	1877	671.36	1871	665.29	397.00	1.50%	6	0.012	0.007	0.720	0.47	0.486	1.5	93.3
1878.1	1878	666.15	1870	658.17	358.10	2.20%	6	0.012	0.007	0.680	0.50	0.586	1.1	100.0
1879.1	1879	663.46	1880	660.85	83.70	3.10%	6	0.012	0.002	0.540	0.01	0.694	0.3	1.0
1880.1	1880	660.85	1869	651.05	323.40	3.00%	6	0.012	0.008	0.730	0.03	0.684	1.2	6.8
1881.1	1881	646.99	1854	638.98	329.30	2.40%	6	0.012	0.160	2.670	0.19	0.613	26.0	37.5

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1882.1	1882	660.60	1883	659.58	183.30	0.60%	8	0.011	0.005	0.670	0.03	0.689	0.8	4.0
1883.1	1883	659.58	1898	659.19	60.00	0.60%	8	0.011	0.011	0.840	0.05	0.744	1.5	7.5
1884.1	1884	657.85	1885	656.10	327.50	0.50%	8	0.011	0.046	1.300	0.14	0.675	6.8	21.3
1885.1	1885	656.10	1886	654.21	362.30	0.50%	8	0.011	0.067	1.530	0.30	0.667	10.0	45.0
1886.1	1886	654.21	1896	652.86	249.00	0.50%	8	0.011	0.079	1.690	0.31	0.680	11.6	46.2
1887.1	1887	658.79	1884	657.85	81.40	1.20%	8	0.011	0.001	0.530	0.00	0.992	0.1	0.7
1888.1	1888	667.79	1898	659.19	172.00	5.00%	8	0.011	0.012	0.760	0.03	2.064	0.6	4.9
1889.1	1889	663.56	1884	657.85	255.70	2.20%	8	0.011	0.008	0.680	0.59	1.379	0.6	89.2
1890.1	1890	661.02	1885	656.10	148.10	3.30%	8	0.011	0.009	0.700	0.03	1.682	0.5	3.8
1891.1	1891	653.36	1896	652.86	75.70	0.70%	8	0.011	0.001	0.530	0.00	0.750	0.2	0.7
1892.1	1892	658.58	1897	651.13	75.00	9.90%	8	0.011	0.002	0.540	0.00	2.910	0.1	0.7
1893.1	1893	661.90	1897	651.13	183.20	5.90%	8	0.011	0.004	0.600	0.01	2.238	0.2	2.0
1894.1	1894	649.18	1895	647.35	343.90	0.50%	8	0.011	0.118	1.990	0.21	0.673	17.5	30.8
1895.1	1895	647.35	675	633.86	301.00	4.50%	8	0.011	0.131	2.150	0.13	1.954	6.7	19.2
1896	1896	652.86	1897	651.13	290.90	0.60%	8	0.011	0.091	1.850	0.35	0.712	12.7	52.9
1897.1	1897	651.13	1894	649.18	370.30	0.50%	8	0.011	0.106	1.880	0.34	0.670	15.8	50.6
1898.1	1898	659.19	1884	657.85	244.80	0.50%	8	0.011	0.026	0.980	0.12	0.683	3.8	17.3
1899.1	1899	640.46	677	635.70	186.60	2.60%	8	0.011	0.030	1.150	0.08	1.474	2.0	12.6
1900.1	1900	649.21	1899	640.46	350.90	2.50%	8	0.011	0.015	0.880	0.67	1.457	1.0	100.0
1901.1	1901	652.97	1900	649.21	251.30	1.50%	8	0.011	0.006	0.650	0.40	1.129	0.6	59.4
1902.1	1902	641.58	1903	638.15	227.60	1.50%	8	0.011	0.003	0.600	0.02	1.133	0.2	2.4
1903.1	1903	638.15	1906	633.37	375.10	1.30%	10	0.011	0.056	1.500	0.46	1.889	3.0	54.7
1904.1	1904	638.42	1903	638.15	33.80	0.80%	10	0.011	0.042	1.370	0.12	1.495	2.8	14.1
1905.1	1905	639.17	1904	638.42	130.00	0.60%	10	0.011	0.042	1.230	0.13	1.271	3.3	15.2
1906.1	1906	633.37	1907	628.36	371.30	1.30%	10	0.011	0.069	1.640	0.48	1.944	3.5	57.5
1907.1	1907	628.36	664	622.20	305.50	2.00%	10	0.012	0.085	1.800	0.13	2.178	3.9	15.3
1908.1	1908	701.76	1909	686.41	497.90	3.10%	8	0.011	0.000	0.000	0.00	1.621	0.0	0.0
1909.1	1909	686.41	2436	683.21	223.80	1.40%	8	0.011	0.000	0.000	0.00	1.104	0.0	0.0
1910.1	1910	690.20	1909	686.41	157.60	2.40%	8	0.011	0.000	0.000	0.00	1.431	0.0	0.0
1911.1	1911	689.23	1914	669.06	466.80	4.30%	8	0.011	0.029	1.080	0.67	1.919	1.5	100.0
1912.1	1912	705.39	1911	689.23	459.80	3.50%	8	0.011	0.015	0.810	0.67	1.730	0.9	100.0
1913.1	1913	663.55	94	662.79	235.70	0.30%	8	0.011	0.000	0.000	0.00	0.524	0.0	0.0
1914.1	1914	669.06	1915	665.09	291.60	1.40%	8	0.011	0.044	1.400	0.51	1.077	4.1	76.6
1915.1	1915	665.09	1916	662.06	107.20	2.80%	8	0.011	0.124	2.140	0.14	1.552	8.0	20.5
1916.1	1916	662.06	1917	657.88	83.90	5.00%	8	0.011	0.126	2.070	0.12	2.060	6.1	17.8
1917.1	1917	657.88	1919	656.52	125.80	1.10%	8	0.011	0.154	2.660	0.19	0.960	16.1	29.0
1918.1	1918	672.19	1917	657.88	286.90	5.00%	8	0.011	0.018	0.880	0.67	2.061	0.8	100.0
1919.1	1919	656.52	95	646.34	48.80	20.90%	8	0.011	0.154	2.160	0.09	4.215	3.7	13.9
1920.1	1920	674.51	1915	665.09	270.20	3.50%	8	0.011	0.069	1.560	0.67	1.723	4.0	100.0
1921.1	1921	676.12	1926	675.45	114.40	0.60%	8	0.011	0.015	0.950	0.07	0.706	2.1	10.0

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1922.1	1922	693.26	1923	690.52	170.80	1.60%	8	0.011	0.011	0.810	0.04	1.169	1.0	6.6
1923.1	1923	690.52	1920	674.51	358.70	4.50%	8	0.011	0.039	1.210	0.67	1.950	2.0	100.0
1924.1	1924	691.50	1923	690.52	177.50	0.60%	8	0.011	0.021	1.020	0.10	0.686	3.1	14.8
1925.1	1925	692.35	1924	691.50	150.80	0.60%	8	0.011	0.017	1.030	0.08	0.693	2.4	12.1
1926.1	1926	675.45	1920	674.51	168.50	0.60%	8	0.011	0.018	1.070	0.09	0.690	2.7	12.8
1927.1	1927	650.30	1257	649.42	467.40	0.20%	27	0.011	2.363	3.250	0.78	10.264	23.0	34.8
1928.1	1928	638.15	840	636.26	478.50	0.40%	24	0.011	10.386	5.110	2.00	10.859	95.6	100.0
1929.1	1929	646.07	1928	638.15	547.90	1.40%	24	0.011	10.464	10.230	1.37	20.773	50.4	68.3
1930.1	1930	663.18	1931	658.71	383.40	1.20%	6	0.011	0.000	0.000	0.32	0.463	0.0	63.9
1931.1	1931	658.71	1932	655.07	364.50	1.00%	8	0.011	0.000	0.000	0.26	0.922	0.0	39.0
1932.1	1932	655.07	1933	654.21	152.90	0.60%	12	0.011	0.000	0.000	0.00	2.041	0.0	0.0
1933.1	1933	654.21	1934	652.09	423.00	0.50%	12	0.011	0.000	0.000	0.00	1.926	0.0	0.0
1934.1	1934	652.09	1935	650.74	271.00	0.50%	12	0.011	0.000	0.000	1.00	1.921	0.0	100.0
1935.1	1935	650.74	LS_LHS	649.00	296.80	0.60%	12	0.011	0.285	0.560	1.00	2.084	13.7	100.0
1936.1	1936	722.77	2166	719.74	289.70	1.00%	15	0.011	1.016	4.900	0.69	5.046	20.1	55.0
1937.1	1937	734.54	2165	731.30	298.00	1.10%	15	0.011	0.775	4.580	0.33	5.145	15.1	26.6
1938.1	1938	720.12	2166	719.74	27.80	1.40%	8	0.011	0.000	0.000	0.20	1.079	0.0	30.7
1939.1	1939	721.89	1938	720.12	60.60	2.90%	8	0.011	0.000	0.000	0.00	1.577	0.0	0.0
1940.1	1940	726.41	1941	724.46	109.10	1.80%	6	0.012	0.003	0.590	0.01	0.525	0.6	2.8
1941.1	1941	724.46	1942	721.39	174.80	1.80%	6	0.012	0.008	0.740	0.03	0.521	1.6	7.0
1942.1	1942	721.39	1943	714.46	253.10	2.70%	6	0.012	0.017	0.950	0.50	0.650	2.6	100.0
1943.1	1943	714.46	1944	704.45	198.20	5.10%	6	0.012	0.026	1.030	0.07	0.883	2.9	13.1
1944.1	1944	704.45	1945	702.86	169.70	0.90%	8	0.012	0.226	1.000	0.67	0.819	27.6	100.0
1945.1	1945	702.86	2437	701.89	144.80	0.70%	8	0.012	0.226	1.000	0.67	0.693	32.6	100.0
1946.1	1946	728.46	1947	722.86	218.00	2.60%	8	0.012	0.047	1.370	0.10	1.356	3.5	15.2
1947.1	1947	722.86	1948	717.53	198.10	2.70%	8	0.012	0.056	1.460	0.11	1.388	4.0	15.9
1948.1	1948	717.53	1949	713.74	117.50	3.20%	8	0.012	0.065	1.530	0.11	1.520	4.2	16.0
1949.1	1949	713.74	1950	708.62	123.20	4.20%	8	0.012	0.068	1.540	0.10	1.725	4.0	15.3
1950.1	1950	708.62	1944	704.45	275.90	1.50%	8	0.012	0.186	2.950	0.62	1.040	17.9	92.9
1951.1	1951	709.69	1950	708.62	207.50	0.50%	8	0.012	0.106	1.770	0.21	0.608	17.5	31.2
1952.1	1952	710.66	1951	709.69	172.60	0.60%	8	0.012	0.101	1.780	0.20	0.634	16.0	30.0
1953.1	1953	716.07	1952	710.66	296.10	1.80%	8	0.012	0.040	1.350	0.65	1.144	3.5	97.3
1954.1	1954	721.03	1953	716.07	177.60	2.80%	8	0.012	0.040	1.280	0.09	1.414	2.8	14.1
1955.1	1955	731.50	1956	730.50	182.70	0.50%	8	0.012	0.000	0.000	0.00	0.626	0.0	0.0
1956.1	1956	730.50	1957	728.80	318.10	0.50%	8	0.012	0.010	0.860	0.06	0.619	1.7	8.5
1957.1	1957	728.80	1954	721.03	419.90	1.90%	8	0.012	0.023	1.060	0.08	1.151	2.0	11.5
1958.1	1958	739.35	1956	730.50	291.00	3.00%	8	0.012	0.003	0.600	0.67	1.476	0.2	100.0
1959.1	1959	738.80	1963	729.71	450.40	2.00%	8	0.012	0.016	0.930	0.57	1.202	1.4	84.8
1960.1	1960	740.62	1959	738.80	172.70	1.10%	8	0.012	0.003	0.570	0.01	0.869	0.3	1.4
1961.1	1961	741.99	1959	738.80	123.40	2.60%	8	0.012	0.009	0.760	0.04	1.361	0.6	5.7

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
1962.1	1962	739.67	1963	729.71	332.00	3.00%	8	0.012	0.008	0.670	0.02	1.466	0.6	3.1
1963.1	1963	729.71	1946	728.46	42.00	3.00%	8	0.012	0.044	1.320	0.10	1.460	3.0	14.4
1964.1	1964	721.50	1965	720.72	134.80	0.60%	8	0.012	0.003	0.610	0.02	0.644	0.5	2.7
1965.1	1965	720.72	1966	719.93	135.30	0.60%	8	0.012	0.014	0.930	0.07	0.647	2.1	9.8
1966.1	1966	719.93	1967	718.82	201.40	0.60%	8	0.012	0.017	1.050	0.08	0.628	2.8	12.3
1967.1	1967	718.82	1968	713.77	295.40	1.70%	8	0.012	0.023	1.030	0.58	1.106	2.0	86.4
1968.1	1968	713.77	1969	712.00	177.20	1.00%	8	0.012	0.037	1.360	0.12	0.846	4.4	17.8
1969.1	1969	712.00	1952	710.66	123.60	1.10%	8	0.012	0.041	1.420	0.12	0.881	4.7	18.0
1970.1	1970	657.88	2188	657.41	304.50	0.20%	18	0.015	2.419	2.720	1.09	2.312	104.7	72.6
1971.1	1971	696.03	334	695.20	75.00	1.10%	10	0.015	0.104	0.300	0.83	1.291	8.1	100.0
1972.1	1972	743.26	281	742.20	265.10	0.40%	8	0.013	0.039	0.920	0.27	0.494	7.8	40.0
1973.1	1973	758.49	292	757.41	55.30	2.00%	6	0.015	0.003	0.590	0.01	0.439	0.6	2.7
1974.1	1974	744.98	2212	742.10	206.00	1.40%	6	0.015	0.001	0.520	0.00	0.372	0.1	0.7
1975.1	1975	721.50	223	720.15	250.00	0.50%	6	0.015	0.004	0.760	0.18	0.231	1.9	35.9
1976.1	1976	771.00	1977	762.00	491.30	1.80%	8	0.012	0.003	0.550	0.51	1.145	0.2	75.9
1977.1	1977	762.00	1978	756.00	347.10	1.70%	8	0.012	0.023	1.040	0.07	1.112	2.1	10.8
1978.1	1978	756.00	1979	743.30	182.00	7.00%	8	0.012	0.036	1.150	0.08	2.235	1.6	11.3
1979.1	1979	743.30	2082	732.63	483.80	2.20%	8	0.012	0.089	1.870	0.67	1.257	7.1	100.0
1980.1	1980	727.50	2083	721.47	488.70	1.20%	8	0.012	0.136	2.480	0.52	0.940	14.5	78.1
1981.1	1981	735.13	2277	734.85	273.30	0.10%	10	0.013	0.276	1.370	0.49	0.453	60.9	59.2
1982.1	1982	738.59	1981	735.13	470.10	0.70%	10	0.013	0.276	2.650	0.47	1.215	22.7	56.7
1983.1	1983	809.88	1674	799.03	350.30	3.10%	8	0.012	0.006	0.650	0.67	1.489	0.4	100.0
1984.1	1984	631.31	1985	629.65	470.00	0.40%	24	0.011	11.559	6.080	1.86	10.269	112.6	93.2
1985.1	1985	629.65	1986	619.03	668.70	1.60%	24	0.011	11.555	10.870	1.45	21.775	53.1	72.3
1986.1	1986	619.03	1987	616.34	733.70	0.40%	24	0.011	11.545	6.040	1.78	10.462	110.3	89.2
1987.1	1987	616.34	2273	615.13	321.70	0.40%	30	0.011	14.065	6.610	1.59	19.212	73.2	63.6
1988.1	1988	617.90	1987	616.34	594.10	0.30%	18	0.011	2.530	2.950	1.12	4.111	61.5	75.0
1989.1	1989	620.57	1988	617.90	489.00	0.50%	18	0.011	2.535	4.950	0.84	5.929	42.8	55.8
1990.1	1990	637.51	1991	636.10	477.50	0.30%	18	0.011	2.420	3.870	0.88	4.360	55.5	58.9
1991.1	1991	636.10	754	635.46	460.10	0.10%	18	0.011	2.414	3.070	1.01	2.992	80.7	67.5
1992.1	1992	639.45	739	639.16	187.30	0.20%	18	0.011	2.424	3.540	0.87	3.157	76.8	57.9
1993.1	1993	612.10	1994	609.90	663.30	0.30%	30	0.011	14.035	4.510	2.45	18.042	77.8	98.2
1994.1	1994	609.90	1995	609.40	549.00	0.10%	30	0.011	14.036	4.420	2.50	9.455	148.5	100.0
1995.1	1995	609.40	1996	608.91	819.40	0.10%	30	0.011	14.035	4.580	2.31	7.661	183.2	92.4
1996.1	1996	608.91	1997	605.90	553.50	0.50%	30	0.011	14.029	7.590	1.55	23.102	60.7	62.0
1997.1	1997	605.90	1998	604.58	369.40	0.40%	30	0.011	14.027	6.500	1.70	18.727	74.9	68.1
1998.1	1998	604.58	2087	601.12	545.10	0.60%	30	0.011	14.339	8.010	1.38	24.961	57.4	55.1
1999.1	1999	683.87	2000	681.97	354.80	0.50%	8	0.011	0.027	0.970	0.26	0.675	4.0	38.3
2000.1	2000	681.97	2001	679.37	501.20	0.50%	8	0.011	0.027	1.000	0.12	0.665	4.1	17.8
2001.1	2001	679.37	2002	676.92	486.90	0.50%	8	0.011	0.028	0.980	0.26	0.655	4.2	38.7

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2002.1	2002	676.92	1805	675.01	283.80	0.70%	8	0.011	0.028	1.080	0.31	0.757	3.7	45.9
2003.1	2003	752.12	2422	750.65	403.00	0.40%	8	0.011	0.000	0.000	0.00	0.558	0.0	0.0
2004.1	2004	745.38	2421	745.15	244.70	0.10%	8	0.011	0.000	0.000	0.09	0.283	0.0	13.0
2005.1	2005	759.05	2426	754.21	158.80	3.00%	8	0.011	0.000	0.000	0.00	1.611	0.0	0.0
2006.1	2006	755.24	2426	754.21	130.10	0.80%	12	0.011	0.216	2.750	0.21	2.421	8.9	21.2
2007.1	2007	756.84	2006	755.24	282.30	0.60%	12	0.011	0.215	2.470	0.39	2.049	10.5	38.8
2008.1	2008	759.16	2007	756.84	129.80	1.80%	12	0.011	0.006	0.190	0.11	3.638	0.2	10.9
2009.1	2009	774.98	2138	770.56	216.40	2.00%	8	0.011	0.000	0.000	0.00	1.319	0.0	0.0
2010.1	2010	776.89	2122	774.82	393.70	0.50%	8	0.011	0.000	0.000	0.15	0.669	0.0	22.2
2011.1	2011	777.75	2010	776.89	50.50	1.70%	8	0.011	0.000	0.000	0.00	1.204	0.0	0.0
2012.1	2012	783.77	2010	776.89	451.90	1.50%	8	0.011	0.000	0.000	0.38	1.139	0.0	57.3
2013.1	2013	740.75	2014	740.22	130.80	0.40%	12	0.011	0.000	0.000	0.14	1.732	0.0	14.2
2014.1	2014	740.22	2143	738.24	269.80	0.70%	15	0.011	0.764	3.960	0.56	4.227	18.1	45.0
2015.1	2015	656.42	2189	655.46	312.90	0.30%	18	0.013	2.428	3.550	0.87	3.761	64.6	57.8
2016.1	2016	657.07	2015	656.42	189.80	0.30%	8	0.015	0.000	0.000	0.59	0.396	0.0	87.9
2017.1	2017	700.75	2141	700.28	404.90	0.10%	21	0.011	1.179	2.360	0.63	4.123	28.6	35.7
2018.1	2018	707.44	2334	706.83	101.80	0.60%	8	0.011	0.032	1.090	0.12	0.714	4.4	18.6
2019.1	2019	705.40	2020	704.74	163.90	0.40%	8	0.011	0.108	1.730	0.21	0.586	18.3	32.0
2020.1	2020	704.74	1472	701.78	232.50	1.30%	8	0.011	0.179	2.880	0.20	1.041	17.2	29.8
2021.1	2021	706.20	2019	705.40	206.00	0.40%	8	0.011	0.000	0.000	0.00	0.575	0.0	0.0
2022.1	2022	710.90	1332	707.50	100.50	3.40%	8	0.011	0.108	1.950	0.12	1.698	6.4	18.5
2023.1	2023	712.65	2022	710.90	106.20	1.60%	8	0.011	0.108	2.080	0.15	1.185	9.1	22.3
2024.1	2024	713.23	2022	710.90	222.80	1.00%	6	0.011	0.000	0.000	0.00	0.438	0.0	0.0
2025.1	2025	682.06	2026	680.18	234.70	0.80%	12	0.015	1.747	3.980	0.81	1.786	97.8	80.7
2026.1	2026	680.18	33	679.85	16.80	2.00%	12	0.015	1.746	5.690	0.58	2.797	62.4	58.3
2027.1	2027	660.23	2028	660.00	56.70	0.40%	12	0.015	0.703	1.900	0.68	1.271	55.3	68.4
2028.1	2028	659.90	234	658.45	338.50	0.40%	18	0.015	2.426	3.490	0.88	3.851	63.0	58.6
2029.1	2029	660.13	2028	659.90	106.80	0.20%	18	0.015	1.726	2.720	0.82	2.731	63.2	54.4
2030.1	2030	661.49	2029	660.13	628.60	0.20%	12	0.015	1.726	3.400	1.00	0.928	186.0	100.0
2031.1	2031	662.61	2030	661.49	558.40	0.20%	12	0.011	1.727	3.400	1.00	1.219	141.7	100.0
2032.1	2032	734.54	2033	733.68	253.40	0.30%	8	0.011	0.001	0.520	0.09	0.538	0.1	13.4
2033.1	2033	733.68	2034	732.66	270.20	0.40%	8	0.011	0.001	0.520	0.11	0.567	0.1	15.8
2034.1	2034	732.66	2035	731.48	318.30	0.40%	8	0.011	0.001	0.520	0.00	0.562	0.1	0.5
2035.1	2035	731.48	2036	730.03	427.90	0.30%	8	0.011	0.004	0.640	0.02	0.537	0.7	3.3
2036.1	2036	730.03	2037	728.85	318.60	0.40%	8	0.011	0.009	0.850	0.06	0.562	1.6	8.3
2037.1	2037	728.85	2038	728.34	205.90	0.20%	12	0.011	0.009	0.780	0.04	1.354	0.7	4.2
2038.1	2038	728.34	1336	726.74	300.00	0.50%	12	0.011	0.013	0.860	0.05	1.987	0.7	5.2
2039.1	2039	725.75	2040	724.19	429.80	0.40%	8	0.011	0.000	0.000	0.00	0.556	0.0	0.0
2040.1	2040	724.19	2041	723.17	269.80	0.40%	8	0.011	0.000	0.000	0.10	0.568	0.0	15.3
2041.1	2041	723.17	2042	722.25	240.10	0.40%	8	0.011	0.000	0.000	0.00	0.571	0.0	0.0

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2042.1	2042	722.25	2043	721.35	236.50	0.40%	8	0.011	0.000	0.000	0.00	0.569	0.0	0.0
2043.1	2043	721.35	1344	720.04	207.70	0.60%	8	0.011	0.000	0.000	0.00	0.733	0.0	0.0
2044.1	2044	734.31	2033	733.68	186.80	0.30%	8	0.011	0.000	0.000	0.00	0.536	0.0	0.0
2045.1	2045	767.14	2046	765.96	65.40	1.80%	6	0.012	0.024	1.150	0.09	0.528	4.6	18.5
2046.1	2046	765.96	2047	765.21	105.20	0.70%	8	0.012	0.024	1.110	0.10	0.715	3.4	15.3
2047.1	2047	765.21	2048	761.30	132.90	2.90%	8	0.012	0.034	1.260	0.10	1.451	2.4	14.8
2048.1	2048	761.30	1694	755.39	203.50	2.90%	8	0.012	0.070	0.920	0.25	1.442	4.8	37.0
2049.1	2049	650.40	2050	649.74	115.80	0.60%	8	0.011	0.001	0.530	0.00	0.697	0.2	0.7
2050.1	2050	649.74	2051	647.37	455.10	0.50%	10	0.011	0.004	0.630	0.15	1.208	0.3	18.3
2051.1	2051	647.37	2053	641.85	461.70	1.20%	10	0.011	0.019	0.950	0.37	1.830	1.0	44.0
2052.1	2052	644.08	2053	641.85	111.30	2.00%	8	0.011	0.001	0.530	0.00	1.307	0.1	0.6
2053.1	2053	641.85	2054	640.72	92.50	1.20%	10	0.011	0.038	1.310	0.10	1.850	2.1	12.4
2054.1	2054	640.72	1905	639.17	145.10	1.10%	10	0.011	0.042	1.370	0.11	1.730	2.4	13.1
2055.1	2055	628.50	648	627.36	198.70	0.60%	8	0.011	0.092	1.840	0.18	0.699	13.2	27.4
2056.1	2056	638.15	2055	628.50	213.90	4.50%	8	0.011	0.084	1.670	0.10	1.961	4.3	15.6
2057.1	2057	642.30	2056	638.15	449.00	0.90%	8	0.011	0.043	1.450	0.35	0.887	4.9	53.1
2058.1	2058	644.86	2057	642.30	313.60	0.80%	8	0.011	0.020	1.060	0.08	0.834	2.4	12.1
2059.1	2059	654.37	2058	644.86	339.60	2.80%	8	0.011	0.003	0.590	0.01	1.545	0.2	2.1
2060.1	2060	721.26	331	710.76	319.90	3.30%	6	0.015	0.343	4.460	0.29	0.569	60.2	58.3
2061.1	2061	714.40	767	713.64	194.30	0.40%	8	0.011	0.000	0.000	0.00	0.577	0.0	0.0
2062.1	2062	752.00	1617	748.20	357.30	1.10%	10	0.012	0.421	3.660	0.57	1.582	26.6	68.8
2063.1	2063	714.67	1143	713.50	252.90	0.50%	12	0.012	2.369	4.670	1.00	1.697	139.6	100.0
2064.1	2064	698.82	2065	696.94	298.30	0.60%	12	0.011	2.626	5.170	1.00	2.160	121.6	100.0
2065.1	2065	696.94	2066	695.16	285.90	0.60%	12	0.011	2.625	5.170	1.00	2.147	122.2	100.0
2066.1	2066	695.16	1021	694.63	45.30	1.20%	12	0.011	2.623	6.500	0.74	2.943	89.1	74.2
2067.1	2067	691.92	2069	690.90	453.50	0.20%	21	0.011	5.455	4.440	1.35	5.740	95.0	77.0
2068.1	2068	692.10	2067	691.92	87.60	0.20%	21	0.011	5.454	4.510	1.27	5.486	99.4	72.7
2069.1	2069	690.90	2070	685.20	491.70	1.20%	21	0.011	5.456	7.990	1.11	13.030	41.9	63.3
2070.1	2070	685.20	2081	681.40	502.00	0.80%	21	0.011	5.457	6.810	0.90	10.530	51.8	51.2
2071.1	2071	677.90	2072	676.90	160.00	0.60%	21	0.011	5.932	6.470	1.00	9.568	62.0	57.1
2072.1	2072	676.90	2073	674.98	224.40	0.90%	21	0.011	5.932	6.460	1.00	11.194	53.0	57.1
2073.1	2073	674.98	2074	674.68	216.10	0.10%	21	0.011	5.932	3.900	1.65	4.509	131.6	94.4
2074.1	2074	674.68	2075	674.17	437.00	0.10%	21	0.011	5.931	4.140	1.52	4.134	143.5	86.7
2075.1	2075	674.17	2076	672.85	156.90	0.80%	21	0.011	5.931	7.240	0.91	11.100	53.4	52.1
2076.1	2076	672.85	2077	669.49	503.40	0.70%	21	0.011	5.930	6.620	0.98	9.888	60.0	56.0
2077.1	2077	669.49	938	668.45	385.10	0.30%	21	0.011	5.929	4.810	1.37	6.290	94.3	78.2
2078.1	2078	666.37	2079	665.73	350.70	0.20%	21	0.011	6.591	4.620	1.56	5.170	127.5	88.9
2079.1	2079	665.73	2080	665.56	45.00	0.40%	21	0.011	6.584	5.750	1.21	7.439	88.5	69.1
2080.1	2080	665.56	433	661.23	188.80	2.30%	21	0.011	6.631	10.050	0.77	18.327	36.2	44.1
2081.1	2081	681.40	1559	678.43	68.30	4.40%	21	0.011	5.457	12.920	0.55	25.242	21.6	31.6

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2082.1	2082	732.63	1980	727.50	283.10	1.80%	8	0.012	0.101	2.020	0.66	1.139	8.8	99.3
2083.1	2083	721.47	1143	713.50	193.90	4.10%	8	0.012	0.137	0.600	0.67	1.715	8.0	100.0
2084.1	2084	731.22	1980	727.50	301.20	1.20%	8	0.012	0.007	0.590	0.01	0.940	0.7	1.1
2085.1	2085	597.00	2090	594.75	517.00	0.40%	30	0.011	15.292	6.160	1.83	20.666	74.0	73.0
2086.1	2086	597.70	2085	597.00	435.70	0.20%	30	0.011	14.888	5.610	1.95	12.557	118.6	78.0
2087.1	2087	601.12	2088	600.68	267.10	0.20%	30	0.011	14.528	5.160	2.12	12.714	114.3	84.7
2088.1	2088	600.68	2196	600.32	300.70	0.10%	30	0.011	14.521	4.920	2.19	10.841	133.9	87.8
2089.1	2089	600.00	2086	597.70	790.30	0.30%	30	0.011	14.897	6.020	1.90	16.900	88.1	75.9
2090.1	2090	594.75	2091	593.90	628.40	0.10%	30	0.011	15.286	4.900	2.39	11.522	132.7	95.4
2091.1	2091	593.90	2092	592.83	590.60	0.20%	30	0.011	16.821	5.720	2.23	13.335	126.1	89.3
2092.1	2092	592.83	2093	591.90	217.00	0.40%	30	0.011	16.821	7.150	1.74	20.512	82.0	69.5
2093.1	2093	591.90	2094	589.53	449.60	0.50%	30	0.011	16.822	7.170	1.86	22.747	74.0	74.5
2094.1	2094	589.53	2095	589.23	378.70	0.10%	30	0.011	16.828	5.560	2.29	8.817	190.9	91.6
2095.1	2095	589.23	2096	588.30	225.10	0.40%	30	0.011	16.835	5.360	2.41	20.137	83.6	96.5
2096.1	2096	588.30	O-3	588.30	359.60	0.00%	30	0.011	16.837	5.400	2.38	0.000	Infinity	95.4
2097.1	2097	614.46	1993	612.10	624.20	0.40%	30	0.011	14.058	6.610	1.59	19.264	73.0	63.6
2098.1	2098	661.00	W-1	658.00	39.80	7.50%	12	0.011	0.253	0.500	1.00	7.474	3.4	100.0
2099.1	2099	661.49	2098	661.00	195.00	0.30%	12	0.011	0.254	0.500	1.00	1.364	18.6	100.0
2101.1	2101	703.55	2102	701.73	183.00	1.00%	8	0.011	0.001	0.530	0.00	0.920	0.1	0.6
2102.1	2102	701.73	2103	699.67	195.50	1.10%	8	0.011	0.002	0.540	0.01	0.948	0.2	0.8
2103.1	2103	699.67	1792	697.62	191.30	1.10%	8	0.011	0.003	0.560	0.01	0.956	0.3	1.3
2104.1	2104	702.92	2105	699.89	292.60	1.00%	8	0.011	0.000	0.000	0.30	0.939	0.0	45.5
2105.1	2105	699.89	2108	698.64	115.40	1.10%	8	0.011	0.000	0.000	0.00	0.961	0.0	0.0
2106.1	2106	708.65	2105	699.89	346.90	2.50%	8	0.011	0.000	0.000	0.00	1.467	0.0	0.0
2107.1	2107	697.19	1788	695.37	175.30	1.00%	8	0.011	0.014	0.850	0.05	0.940	1.5	7.2
2108.1	2108	698.64	2107	697.19	130.90	1.10%	8	0.011	0.010	0.750	0.03	0.971	1.0	5.0
2109.1	2109	707.18	240	704.75	404.20	0.60%	6	0.015	0.000	0.000	0.00	0.244	0.0	0.0
2110.1	2110	739.45	1982	738.59	300.70	0.30%	10	0.013	0.089	1.220	0.22	0.757	11.7	25.9
2111.1	2111	746.57	284	746.03	88.30	0.60%	6	0.015	0.045	1.100	0.18	0.246	18.2	35.6
2112.1	2112	743.88	1972	743.26	155.10	0.40%	8	0.013	0.001	0.520	0.00	0.494	0.1	0.5
2113.1	2113	746.78	288	744.26	146.20	1.70%	8	0.013	0.000	0.420	0.00	1.025	0.0	0.5
2114.1	2114	705.89	195	704.50	134.30	1.00%	12	0.015	0.629	3.440	0.39	2.030	31.0	38.9
2115.1	2115	750.23	2116	748.02	422.90	0.50%	6	0.013	0.000	0.000	0.00	0.262	0.0	0.0
2116.1	2116	748.02	285	747.83	108.20	0.20%	6	0.013	0.000	0.000	0.08	0.152	0.0	16.7
2117.1	2117	726.18	2063	714.67	365.40	3.20%	12	0.012	1.197	2.360	1.00	4.428	27.0	100.0
2118.1	2118	763.62	2119	762.71	109.00	0.80%	8	0.011	0.000	0.000	0.00	0.843	0.0	0.0
2119.1	2119	762.71	2120	762.20	52.70	1.00%	8	0.011	0.000	0.000	0.00	0.908	0.0	0.0
2120.1	2120	762.20	2121	759.60	335.20	0.80%	8	0.011	0.000	0.000	0.00	0.813	0.0	0.0
2121.1	2121	759.60	2008	759.16	20.60	2.10%	8	0.011	0.000	0.000	0.00	1.348	0.0	0.0
2122.1	2122	774.82	2134	766.10	356.20	2.40%	8	0.011	0.000	0.000	0.62	1.444	0.0	93.4

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2123.1	2123	756.79	1633	756.40	195.50	0.20%	10	0.012	0.243	1.690	0.36	0.685	35.4	42.6
2124.1	2124	705.59	346	698.52	663.10	1.10%	8	0.015	0.618	2.740	0.67	0.699	88.5	100.0
2125.1	2125	697.05	344	696.05	359.50	0.30%	10	0.015	0.660	1.870	0.83	0.647	102.0	100.0
2126.1	2126	685.86	458	680.85	222.00	2.30%	8	0.011	0.215	3.100	0.19	1.387	15.5	28.0
2127.1	2127	680.27	2130	676.42	526.90	0.70%	8	0.011	0.216	2.770	0.25	0.789	27.3	37.7
2128.1	2128	670.45	453	666.79	821.80	0.40%	10	0.011	0.301	2.550	0.31	1.117	27.0	36.9
2129.1	2129	672.15	2128	670.45	443.90	0.40%	8	0.011	0.219	2.200	0.30	0.571	38.3	45.4
2130.1	2130	676.42	2435	673.69	366.10	0.70%	8	0.011	0.217	2.790	0.45	0.797	27.2	66.8
2131.1	2131	687.77	2126	685.86	557.00	0.30%	8	0.011	0.045	1.080	0.25	0.541	8.2	36.8
2132.1	2132	740.22	209	738.99	332.70	0.40%	8	0.015	0.002	0.560	0.03	0.412	0.6	4.9
2133.1	2133	764.56	2008	759.16	253.30	2.10%	8	0.011	0.000	0.000	0.54	1.348	0.0	81.0
2134.1	2134	766.10	2133	764.56	253.30	0.60%	8	0.011	0.000	0.000	0.15	0.720	0.0	23.1
2135.1	2135	775.60	2122	774.82	121.60	0.60%	8	0.011	0.000	0.000	0.00	0.739	0.0	0.0
2136.1	2136	766.82	2134	766.10	123.90	0.60%	8	0.011	0.000	0.000	0.00	0.704	0.0	0.0
2137.1	2137	751.35	2423	748.76	334.10	0.80%	8	0.011	0.000	0.000	0.00	0.813	0.0	0.0
2138.1	2138	770.56	2134	766.10	217.90	2.00%	8	0.011	0.000	0.000	0.00	1.321	0.0	0.0
2139.1	2139	699.00	1017	697.90	416.30	0.30%	21	0.011	1.186	3.000	0.53	6.221	19.1	30.2
2140.1	2140	699.04	2139	699.00	492.40	0.00%	21	0.011	1.180	1.720	0.79	1.091	108.2	45.4
2141.1	2141	700.28	2140	699.04	492.70	0.30%	21	0.011	1.178	2.960	0.60	6.071	19.4	34.2
2142.1	2142	736.39	1937	734.54	251.70	0.70%	15	0.011	0.773	3.970	0.55	4.230	18.3	44.2
2143.1	2143	738.24	2142	736.39	248.10	0.70%	15	0.011	0.769	3.990	0.55	4.261	18.0	44.0
2144.1	2144	741.20	2014	740.22	447.30	0.20%	15	0.011	0.754	2.550	0.50	2.310	32.7	40.0
2145.1	2145	742.17	2144	741.20	431.50	0.20%	15	0.011	0.742	2.560	0.49	2.339	31.7	39.3
2146.1	2146	743.25	2145	742.17	490.40	0.20%	15	0.011	0.738	2.540	0.55	2.315	31.9	44.2
2147.1	2147	743.97	2146	743.25	311.20	0.20%	15	0.011	0.736	2.590	0.48	2.373	31.0	38.7
2148.1	2148	745.05	2147	743.97	484.60	0.20%	15	0.011	0.716	2.520	0.55	2.329	30.7	43.6
2149.1	2149	745.49	2148	745.05	179.30	0.20%	15	0.011	0.682	2.600	0.46	2.444	27.9	36.5
2150.1	2150	745.79	2149	745.49	161.00	0.20%	15	0.011	0.658	2.400	0.47	2.130	30.9	37.7
2151.1	2151	755.88	2150	745.79	220.60	4.60%	8	0.011	0.379	4.470	0.21	1.974	19.2	31.0
2152.1	2152	761.61	2151	755.88	285.30	2.00%	8	0.011	0.380	4.710	0.67	1.308	29.1	100.0
2153.1	2153	765.73	2152	761.61	335.00	1.20%	8	0.011	0.319	3.800	0.27	1.024	31.2	39.9
2154.1	2154	771.84	1749	771.22	154.60	0.40%	8	0.011	0.834	3.690	0.67	0.584	142.7	100.0
2155.1	2155	772.33	2154	771.84	54.10	0.90%	8	0.011	0.843	3.730	0.67	0.879	95.9	100.0
2156.1	2156	772.90	2155	772.33	141.80	0.40%	8	0.011	1.162	5.150	0.67	0.585	198.7	100.0
2157.1	2157	697.00	2159	694.53	290.20	0.90%	12	0.011	0.484	3.700	0.55	2.511	19.3	55.2
2158.1	2158	693.28	2068	692.10	126.80	0.90%	21	0.011	5.454	7.000	0.88	11.677	46.7	50.1
2159.1	2159	694.53	2158	693.28	81.50	1.50%	12	0.011	0.484	4.560	0.26	3.370	14.4	26.2
2160.1	2160	699.48	2157	697.00	296.50	0.80%	12	0.011	0.485	3.680	0.55	2.489	19.5	55.4
2161.1	2161	706.12	1150	703.60	295.80	0.90%	8	0.011	0.222	2.950	0.50	0.852	26.0	74.5
2162.1	2162	707.40	2161	706.12	156.10	0.80%	8	0.011	0.217	2.900	0.24	0.836	25.9	36.6

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2163.1	2163	773.86	2156	772.90	109.60	0.90%	8	0.011	0.893	3.960	0.67	0.864	103.4	100.0
2164.1	2164	778.29	2163	773.86	144.70	3.10%	8	0.011	1.145	5.070	0.67	1.615	70.9	100.0
2165.1	2165	731.30	1936	722.77	488.80	1.70%	15	0.011	0.776	5.410	0.77	6.518	11.9	61.6
2166.1	2166	719.74	2167	716.21	318.90	1.10%	15	0.011	1.014	4.990	0.38	5.191	19.5	30.3
2167.1	2167	716.21	2168	711.92	416.30	1.00%	15	0.011	1.011	4.870	0.39	5.009	20.2	30.8
2168.1	2168	711.92	2169	709.54	477.80	0.50%	15	0.011	1.007	3.740	0.60	3.482	28.9	47.8
2169.1	2169	709.54	2170	706.82	360.60	0.80%	15	0.011	1.077	4.430	0.63	4.285	25.1	50.1
2170.1	2170	706.82	2171	703.98	415.50	0.70%	15	0.011	1.074	4.270	0.44	4.079	26.3	35.4
2171.1	2171	703.98	2017	700.75	402.80	0.80%	15	0.011	1.073	4.520	0.42	4.418	24.3	34.0
2172.1	2172	769.00	1289	764.00	274.70	1.80%	8	0.012	0.021	1.030	0.57	1.142	1.8	86.1
2173.1	2173	777.00	1301	776.00	186.20	0.50%	8	0.012	0.000	0.000	0.00	0.620	0.0	0.0
2174.1	2174	728.00	1295	718.18	288.90	3.40%	8	0.012	0.100	1.920	0.67	1.560	6.4	100.0
2175.1	2175	627.83	2177	624.29	131.90	2.70%	8	0.011	0.144	2.360	0.15	1.512	9.5	22.3
2176.1	2176	628.88	2175	627.83	194.40	0.50%	8	0.011	0.008	0.440	0.09	0.678	1.2	13.5
2177.1	2177	624.29	661	617.24	176.00	4.00%	8	0.011	0.145	2.290	0.13	1.847	7.9	20.1
2178.1	2178	636.44	2175	627.83	276.30	3.10%	8	0.011	0.017	0.860	0.67	1.629	1.0	100.0
2179.1	2179	640.22	2178	636.44	305.70	1.20%	8	0.011	0.003	0.550	0.01	1.026	0.3	0.9
2180.1	2180	648.03	2181	626.62	473.80	4.50%	8	0.011	0.002	0.560	0.67	1.962	0.1	100.0
2181.1	2181	626.62	2183	620.30	425.90	1.50%	8	0.011	0.033	1.220	0.09	1.124	3.0	13.9
2182.1	2182	627.50	2181	626.62	156.00	0.60%	8	0.011	0.003	0.620	0.02	0.693	0.4	3.0
2183.1	2183	620.30	660	617.81	449.10	0.60%	8	0.011	0.033	1.090	0.27	0.687	4.8	39.9
2184.1	2184	620.17	655	615.96	408.90	1.00%	15	0.011	0.000	0.000	0.00	5.006	0.0	0.0
2185.1	2185	621.60	647	620.79	181.80	0.40%	8	0.011	0.003	0.610	0.02	0.616	0.5	2.5
2186.1	2186	657.16	235	657.00	52.10	0.30%	18	0.015	2.417	3.720	0.83	3.262	74.1	55.5
2187.1	2187	659.32	237	659.02	101.20	0.30%	8	0.015	0.000	0.320	0.00	0.369	0.1	0.4
2188.1	2188	657.41	2186	657.16	121.40	0.20%	18	0.015	2.418	3.310	0.92	2.670	90.6	61.0
2189.1	2189	655.46	2190	655.15	84.90	0.40%	18	0.015	2.426	3.690	0.84	3.555	68.3	55.9
2190.1	2190	655.15	2191	654.84	91.40	0.30%	18	0.015	2.426	3.660	0.85	3.427	70.8	56.3
2191.1	2191	654.84	1282	653.40	492.00	0.30%	18	0.011	2.424	3.890	0.88	4.340	55.8	58.9
2192.1	2192	652.02	710	651.84	79.20	0.20%	18	0.011	2.421	3.980	0.79	3.825	63.3	52.5
2193.1	2193	641.20	1992	639.45	588.30	0.30%	18	0.011	2.430	3.910	0.88	4.376	55.5	58.8
2194.1	2194	777.92	1581	777.02	236.10	0.40%	8	0.012	0.028	0.890	0.13	0.522	5.4	19.7
2195.1	2195	610.09	2196	600.32	162.20	6.00%	8	0.011	0.388	4.470	0.19	2.265	17.1	28.9
2196.1	2196	600.32	2089	600.00	354.70	0.10%	30	0.011	14.905	5.360	2.07	9.410	158.4	82.8
2198.1	2198	736.11	2199	728.36	291.20	2.70%	6	0.015	0.024	1.170	0.50	0.513	4.7	100.0
2199.1	2199	728.36	248	724.50	141.00	2.70%	6	0.015	0.024	1.140	0.09	0.520	4.6	18.3
2200.1	2200	695.60	1544	693.43	413.00	0.50%	12	0.011	0.219	2.380	0.24	1.973	11.1	23.7
2201.1	2201	697.76	2200	695.60	413.00	0.50%	12	0.011	0.111	1.820	0.18	1.968	5.6	17.8
2202.1	2202	710.71	1539	708.62	368.60	0.60%	8	0.011	0.037	1.160	0.28	0.695	5.4	42.4
2203.1	2203	716.12	1538	712.50	112.80	3.20%	8	0.011	0.023	1.020	0.07	1.653	1.4	10.2

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2204.1	2204	667.73	2205	667.20	5.70	9.20%	15	0.011	0.099	1.670	0.08	14.995	0.7	6.4
2205.1	2205	667.20	27	665.80	498.30	0.30%	24	0.011	0.153	1.530	0.19	9.159	1.7	9.6
2206.1	2206	761.77	293	758.48	637.90	0.50%	6	0.013	0.022	0.900	0.12	0.260	8.3	24.4
2207.1	2207	812.00	2208	808.32	163.10	2.30%	8	0.011	0.010	0.780	0.04	1.386	0.7	6.2
2208.1	2208	808.32	2209	807.50	151.10	0.50%	8	0.011	0.016	1.020	0.08	0.680	2.3	11.8
2209.1	2209	807.50	2210	806.50	116.70	0.90%	8	0.011	0.023	1.090	0.08	0.855	2.7	12.5
2210.1	2210	806.50	1584	803.68	214.80	1.30%	8	0.011	0.023	1.020	0.07	1.058	2.2	10.2
2211.1	2211	743.87	2212	742.10	127.90	1.40%	8	0.013	0.000	0.420	0.00	0.919	0.0	0.5
2212.1	2212	742.10	265	739.11	284.50	1.10%	6	0.015	0.002	0.540	0.30	0.322	0.6	60.8
2213.1	2213	715.14	2214	714.90	89.70	0.30%	8	0.011	0.059	1.150	0.19	0.478	12.4	27.9
2214.1	2214	714.90	2215	695.38	450.60	4.30%	8	0.011	0.059	1.430	0.67	1.921	3.1	100.0
2215.1	2215	695.38	2441	682.31	368.30	3.50%	8	0.011	0.073	1.590	0.67	1.739	4.2	100.0
2216.1	2216	682.41	2441	682.31	102.50	0.10%	8	0.011	0.018	0.710	0.11	0.288	6.2	16.9
2217.1	2217	695.97	2215	695.38	97.90	0.60%	8	0.011	0.014	0.930	0.07	0.717	1.9	9.8
2218.1	2218	676.39	473	675.32	286.70	0.40%	8	0.012	0.092	1.470	0.32	0.517	17.8	48.1
2219.1	2219	676.67	2218	676.39	36.20	0.80%	8	0.011	0.092	2.040	0.17	0.812	11.3	25.3
2220.1	2220	677.47	2219	676.67	158.70	0.50%	8	0.011	0.092	1.740	0.19	0.655	14.0	28.4
2221.1	2221	779.30	2222	774.16	84.40	6.10%	8	0.011	0.001	0.530	0.00	2.278	0.1	0.7
2222.1	2222	774.16	2223	766.59	294.30	2.60%	8	0.011	0.004	0.610	0.67	1.480	0.2	100.0
2223.1	2223	766.59	2224	758.10	172.70	4.90%	8	0.011	0.019	0.950	0.06	2.046	0.9	9.1
2224.1	2224	758.10	2225	757.62	145.30	0.30%	8	0.011	0.022	0.890	0.11	0.531	4.1	16.4
2225.1	2225	757.62	2228	752.20	306.80	1.80%	8	0.011	0.034	1.260	0.10	1.227	2.8	14.9
2226.1	2226	778.00	2233	772.52	140.00	3.90%	8	0.011	0.001	0.530	0.00	1.826	0.1	0.7
2227.1	2227	762.52	2225	757.62	255.80	1.90%	8	0.011	0.003	0.590	0.50	1.278	0.2	75.6
2228.1	2228	752.20	2230	750.26	176.90	1.10%	8	0.011	0.114	1.900	0.21	0.967	11.8	31.2
2229.1	2229	750.26	2231	748.87	257.00	0.50%	8	0.011	0.115	1.970	0.34	0.679	16.9	51.2
2230.1	2230	750.26	2229	750.26	86.80	0.00%	8	0.011	0.114	1.130	0.31	0.000	Infinity	45.9
2231.1	2231	748.87	2232	747.16	66.00	2.60%	8	0.011	0.115	2.070	0.14	1.486	7.7	20.4
2232.1	2232	747.16	2150	745.79	427.90	0.30%	12	0.011	0.116	1.570	0.20	1.540	7.5	20.2
2233.1	2233	772.52	2223	766.59	70.40	8.40%	8	0.011	0.006	0.620	0.02	2.678	0.2	2.4
2235.1	2235	765.98	2236	764.79	123.80	1.00%	8	0.011	0.004	0.590	0.01	0.905	0.4	1.9
2236.1	2236	764.79	2237	754.66	503.80	2.00%	8	0.011	0.010	0.750	0.03	1.309	0.8	5.2
2237.1	2237	754.66	2228	752.20	467.60	0.50%	8	0.011	0.041	1.210	0.28	0.669	6.1	41.3
2238.1	2238	763.01	2228	752.20	289.40	3.70%	8	0.011	0.002	0.540	0.67	1.784	0.1	100.0
2239.1	2239	655.93	2240	642.57	379.10	3.50%	8	0.011	0.003	0.570	0.67	1.733	0.2	100.0
2240.1	2240	642.57	2244	636.28	256.90	2.40%	8	0.011	0.016	0.870	0.67	1.444	1.1	100.0
2241.1	2241	648.08	2242	636.41	371.80	3.10%	8	0.011	0.006	0.630	0.67	1.635	0.4	100.0
2242.1	2242	636.41	105	633.04	328.70	1.00%	8	0.011	0.034	1.330	0.11	0.935	3.6	16.9
2243.1	2243	626.18	101	620.83	411.60	1.30%	8	0.011	0.044	1.400	0.11	1.052	4.1	16.8
2244.1	2244	636.28	2243	626.18	500.00	2.00%	8	0.011	0.025	1.100	0.08	1.312	1.9	12.3

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2245.1	2245	698.00	2247	696.72	245.30	0.50%	8	0.011	0.002	0.600	0.02	0.667	0.3	2.5
2246.1	2246	701.30	2245	698.00	403.80	0.80%	8	0.011	0.001	0.520	0.00	0.834	0.1	0.5
2247.1	2247	696.72	2255	695.45	295.10	0.40%	8	0.011	0.003	0.640	0.15	0.606	0.5	22.4
2248.1	2248	697.40	2247	696.72	150.10	0.50%	8	0.011	0.000	0.000	0.00	0.621	0.0	0.0
2249.1	2249	700.96	2250	698.52	286.80	0.90%	8	0.011	0.001	0.520	0.25	0.851	0.1	37.1
2250.1	2250	698.52	2255	695.45	377.20	0.80%	8	0.011	0.002	0.540	0.22	0.833	0.2	33.6
2251.1	2251	692.72	2256	691.60	341.90	0.30%	10	0.011	0.009	0.780	0.04	0.958	0.9	5.0
2252.1	2252	693.77	2251	692.72	320.20	0.30%	10	0.011	0.000	0.000	0.00	0.958	0.0	0.0
2253.1	2253	690.11	2254	688.56	489.60	0.30%	10	0.011	0.017	0.980	0.16	0.942	1.8	18.8
2254.1	2254	688.56	560	688.08	129.20	0.40%	10	0.011	0.019	1.000	0.07	1.020	1.8	8.5
2255.1	2255	695.45	2251	692.72	261.30	1.00%	8	0.011	0.007	0.660	0.29	0.943	0.7	44.2
2256.1	2256	691.60	2253	690.11	469.90	0.30%	10	0.011	0.015	0.950	0.15	0.942	1.6	18.0
2257.1	2257	690.30	2268	677.00	231.10	5.80%	8	0.011	0.007	0.670	0.02	2.214	0.3	3.4
2258.1	2258	669.27	2265	668.50	134.80	0.60%	8	0.011	0.159	2.270	0.23	0.698	22.8	34.8
2259.1	2259	695.85	2260	678.37	325.60	5.40%	8	0.011	0.005	0.630	0.02	2.138	0.3	2.7
2260.1	2260	678.37	2261	673.96	104.00	4.20%	8	0.011	0.017	0.910	0.06	1.901	0.9	8.5
2261.1	2261	673.96	2262	670.58	105.90	3.20%	8	0.011	0.020	0.960	0.06	1.649	1.2	9.2
2262.1	2262	670.58	2258	669.27	235.80	0.60%	8	0.011	0.129	2.050	0.21	0.688	18.8	32.2
2263.1	2263	673.00	2264	670.40	83.60	3.10%	8	0.011	0.004	0.580	0.01	1.627	0.2	1.6
2264.1	2264	670.40	2262	670.58	286.80	-0.10%	8	0.011	0.102	0.620	0.44	0.231	44.1	65.9
2265.1	2265	668.50	2266	667.55	171.40	0.60%	8	0.011	0.163	2.260	0.24	0.687	23.7	35.6
2266.1	2266	667.55	2267	667.40	8.50	1.80%	8	0.011	0.163	2.630	0.18	1.223	13.3	26.3
2267.1	2267	667.40	2269	664.65	477.90	0.60%	8	0.011	0.166	2.310	0.39	0.700	23.6	58.3
2268.1	2268	677.00	2258	669.27	200.30	3.90%	8	0.011	0.018	0.930	0.06	1.813	1.0	8.8
2269.1	2269	664.65	2270	656.15	494.10	1.70%	8	0.011	0.212	3.140	0.67	1.211	17.5	100.0
2270.1	2270	656.15	2271	649.76	490.20	1.30%	8	0.011	0.265	3.720	0.59	1.054	25.1	88.4
2271.1	2271	649.76	2272	649.24	126.90	0.40%	8	0.011	0.313	2.530	0.36	0.591	52.9	53.7
2272.1	2272	649.24	1839	647.53	443.50	0.40%	8	0.011	0.323	1.450	0.64	0.573	56.4	96.6
2273.1	2273	615.13	2097	614.46	178.10	0.40%	30	0.011	14.063	6.610	1.59	19.217	73.2	63.6
2274.1	2274	632.80	1989	631.59	409.00	0.30%	18	0.011	2.537	3.970	0.82	4.364	58.1	54.7
2275.1	2275	633.79	854	631.31	437.00	0.60%	24	0.011	11.457	5.640	2.00	13.016	88.0	100.0
2276.1	2276	725.78	2443	724.26	301.60	0.50%	6	0.015	0.000	0.000	0.00	0.223	0.0	0.0
2277.1	2277	734.85	161	734.74	6.80	1.60%	10	0.013	0.276	1.740	0.38	1.802	15.3	46.0
2278.1	2278	698.32	2279	696.04	219.70	1.00%	8	0.013	0.000	0.000	0.00	0.796	0.0	0.0
2279.1	2279	696.04	1426	695.49	47.00	1.20%	8	0.013	0.000	0.000	0.00	0.845	0.0	0.0
2280.1	2280	792.22	2281	790.81	262.50	0.50%	8	0.011	0.002	0.590	0.16	0.676	0.3	23.3
2281.1	2281	790.81	2282	771.15	447.80	4.40%	8	0.011	0.011	0.760	0.67	1.934	0.5	100.0
2282.1	2282	771.15	903	770.31	381.90	0.20%	8	0.011	0.049	0.970	0.24	0.433	11.3	36.5
2283.1	2283	771.55	2282	771.15	308.70	0.10%	8	0.011	0.020	0.600	0.14	0.332	6.0	20.3
2284.1	2284	791.60	2289	778.50	303.30	4.30%	8	0.011	0.003	0.570	0.01	1.918	0.1	1.5

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2285.1	2285	770.85	2286	763.90	299.30	2.30%	8	0.011	0.009	0.690	0.02	1.406	0.6	3.7
2286.1	2286	763.90	2287	757.55	284.70	2.20%	8	0.011	0.009	0.690	0.66	1.378	0.6	99.1
2287.1	2287	757.55	2288	757.13	62.50	0.70%	8	0.011	0.009	0.760	0.04	0.757	1.1	5.7
2288.1	2288	757.13	2373	754.67	425.50	0.60%	8	0.011	0.009	0.770	0.04	0.702	1.2	6.0
2289.1	2289	778.50	2283	771.55	129.90	5.30%	8	0.011	0.014	0.790	0.04	2.135	0.7	5.6
2290.1	2290	613.00	2291	610.76	57.30	3.90%	8	0.011	0.018	0.920	0.06	1.824	1.0	8.5
2291.1	2291	610.76	1431	605.90	315.00	1.50%	8	0.011	0.054	1.510	0.12	1.146	4.7	17.7
2292.1	2292	621.00	2291	610.76	413.60	2.50%	8	0.011	0.015	0.880	0.05	1.452	1.0	7.9
2293.1	2293	658.42	2294	656.25	204.10	1.10%	8	0.011	0.008	0.700	0.03	0.952	0.9	4.1
2294.1	2294	656.25	2295	655.13	203.80	0.50%	8	0.011	0.015	0.970	0.07	0.684	2.2	10.7
2295.1	2295	655.13	2296	650.77	326.60	1.30%	8	0.011	0.019	0.950	0.06	1.066	1.8	9.2
2296.1	2296	650.77	2299	648.11	308.60	0.90%	8	0.011	0.035	1.300	0.12	0.857	4.1	17.7
2297.1	2297	651.79	2296	650.77	91.90	1.10%	8	0.011	0.004	0.600	0.01	0.973	0.5	2.0
2298.1	2298	654.28	2297	651.79	96.80	2.60%	8	0.011	0.003	0.560	0.01	1.480	0.2	1.2
2299.1	2299	648.11	2303	642.03	368.70	1.60%	8	0.011	0.046	1.400	0.54	1.185	3.9	81.3
2300.1	2300	654.72	2301	653.84	62.70	1.40%	8	0.011	0.002	0.540	0.00	1.093	0.1	0.7
2301.1	2301	653.84	2302	647.64	452.10	1.40%	8	0.011	0.003	0.550	0.35	1.081	0.3	52.6
2302.1	2302	647.64	2303	642.03	299.40	1.90%	8	0.011	0.014	0.850	0.05	1.264	1.1	7.3
2303.1	2303	642.03	2304	640.87	213.50	0.50%	8	0.011	0.079	1.660	0.18	0.680	11.6	26.3
2304.1	2304	640.87	2305	639.78	197.00	0.60%	8	0.011	0.086	1.740	0.18	0.687	12.5	27.0
2305.1	2305	639.78	2306	638.92	153.60	0.60%	8	0.011	0.094	1.810	0.19	0.691	13.6	28.0
2306.1	2306	638.92	2175	627.83	224.40	4.90%	8	0.011	0.100	1.820	0.11	2.052	4.9	16.3
2307.1	2307	656.54	2308	649.67	141.10	4.90%	8	0.011	0.006	0.650	0.02	2.037	0.3	3.0
2308.1	2308	649.67	2057	642.30	191.20	3.90%	8	0.011	0.013	0.780	0.04	1.812	0.7	5.5
2309.1	2309	650.35	2310	648.44	179.90	1.10%	8	0.011	0.003	0.570	0.01	0.951	0.3	1.5
2310.1	2310	648.44	2056	638.15	321.00	3.20%	8	0.011	0.019	0.890	0.05	1.653	1.1	7.4
2311.1	2311	655.07	2310	648.44	166.10	4.00%	8	0.011	0.008	0.670	0.02	1.844	0.4	3.2
2312.1	2312	616.62	2313	615.37	330.00	0.40%	8	0.011	0.025	0.840	0.13	0.568	4.4	19.1
2313.1	2313	615.37	2314	614.04	349.40	0.40%	8	0.011	0.049	1.180	0.25	0.569	8.6	38.2
2314.1	2314	614.04	2315	612.68	358.50	0.40%	8	0.011	0.073	1.430	0.28	0.569	12.8	42.2
2315.1	2315	612.68	2316	611.57	291.00	0.40%	8	0.011	0.097	1.610	0.32	0.570	17.0	47.8
2316.1	2316	611.57	2317	606.69	353.80	1.40%	10	0.011	0.112	2.100	0.49	1.965	5.7	59.4
2317.1	2317	606.69	2318	605.08	103.80	1.60%	10	0.011	0.129	2.250	0.15	2.084	6.2	18.1
2318.1	2318	605.08	2087	601.12	433.90	0.90%	10	0.011	0.200	2.870	0.21	1.599	12.5	25.2
2319.1	2319	609.08	2320	607.58	399.80	0.40%	8	0.011	0.004	0.650	0.02	0.565	0.7	3.6
2320.1	2320	607.58	2324	606.03	415.30	0.40%	10	0.011	0.019	1.010	0.08	1.022	1.8	10.0
2321.1	2321	606.87	2322	606.83	376.80	0.00%	10	0.011	0.008	0.470	0.08	0.172	4.5	9.6
2322.1	2322	606.83	2323	606.35	189.60	0.30%	10	0.011	0.021	0.920	0.10	0.842	2.4	11.4
2323.1	2323	606.35	2324	606.03	89.80	0.40%	10	0.011	0.021	1.080	0.08	0.999	2.1	10.2
2324.1	2324	606.03	2325	605.81	65.60	0.30%	10	0.011	0.060	1.220	0.16	0.969	6.2	19.7

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2325.1	2325	605.81	2318	605.08	179.50	0.40%	10	0.011	0.060	1.260	0.16	1.067	5.6	19.3
2326.1	2326	799.69	1585	796.34	130.10	2.60%	8	0.012	0.063	1.540	0.11	1.358	4.6	16.7
2327.1	2327	805.25	2330	800.90	187.70	2.30%	8	0.011	0.010	0.790	0.04	1.405	0.7	6.2
2328.1	2328	812.50	2327	805.25	220.10	3.30%	8	0.011	0.006	0.630	0.02	1.675	0.3	2.4
2329.1	2329	812.60	2328	812.50	229.60	0.00%	8	0.011	0.000	0.000	0.00	0.193	0.0	0.0
2330.1	2330	800.90	2326	799.69	86.40	1.40%	8	0.011	0.014	0.820	0.04	1.092	1.3	6.2
2331.1	2331	701.80	2017	700.75	24.40	4.30%	12	0.011	0.106	1.960	0.13	5.648	1.9	12.9
2332.1	2332	705.98	2331	701.80	300.50	1.40%	12	0.011	0.106	2.010	0.14	3.210	3.3	13.8
2333.1	2333	705.98	2332	705.98	127.90	0.00%	12	0.011	0.032	0.440	0.20	0.000	Infinity	19.9
2334.1	2334	706.83	2333	705.98	103.10	0.80%	8	0.011	0.032	1.160	0.12	0.838	3.8	17.8
2335.1	2335	709.61	2018	707.44	413.70	0.50%	8	0.011	0.031	1.020	0.13	0.669	4.7	19.3
2336.1	2336	709.82	2335	709.61	22.20	0.90%	8	0.011	0.031	1.290	0.11	0.899	3.5	16.3
2337.1	2337	711.17	1775	710.44	125.70	0.60%	8	0.011	0.031	1.070	0.12	0.703	4.4	18.6
2338.1	2338	711.70	2337	711.17	86.10	0.60%	8	0.011	0.031	1.090	0.12	0.724	4.3	18.4
2339.1	2339	712.27	2338	711.70	96.50	0.60%	8	0.011	0.031	1.070	0.12	0.709	4.4	18.5
2340.1	2340	713.23	2339	712.27	135.30	0.70%	8	0.011	0.000	0.000	0.00	0.777	0.0	0.0
2341.1	2341	713.46	2340	713.23	26.10	0.90%	8	0.011	0.000	0.000	0.00	0.867	0.0	0.0
2342.1	2342	713.70	2341	713.46	28.40	0.80%	8	0.011	0.000	0.000	0.00	0.848	0.0	0.0
2343.1	2343	718.14	2344	713.03	201.50	2.50%	8	0.011	0.000	0.000	0.00	1.470	0.0	0.0
2344.1	2344	713.03	2339	712.27	27.70	2.70%	8	0.011	0.000	0.000	0.00	1.529	0.0	0.0
2345.1	2345	708.11	2346	707.22	264.40	0.30%	21	0.011	0.002	0.580	0.10	7.021	0.0	5.8
2346.1	2346	707.22	2347	705.65	486.20	0.30%	21	0.011	0.002	0.570	0.10	6.877	0.0	5.6
2347.1	2347	705.65	2348	704.56	326.70	0.30%	21	0.011	0.004	0.660	0.02	6.990	0.1	1.4
2348.1	2348	704.56	2349	703.28	391.40	0.30%	21	0.011	0.005	0.610	0.11	6.921	0.1	6.1
2349.1	2349	703.28	2350	702.39	230.50	0.40%	21	0.011	0.005	0.600	0.01	7.520	0.1	0.7
2350.1	2350	702.39	2351	700.78	185.90	0.90%	21	0.011	0.005	0.650	0.02	11.263	0.0	1.2
2351.1	2351	700.78	2352	699.08	200.10	0.80%	21	0.011	0.006	0.650	0.02	11.154	0.0	1.3
2352.1	2352	699.08	2353	698.34	77.70	1.00%	21	0.011	0.006	0.660	0.02	11.812	0.0	1.3
2353.1	2353	698.34	2354	693.99	531.80	0.80%	21	0.011	0.006	0.670	0.03	10.946	0.1	1.4
2354.1	2354	693.99	2355	689.74	530.70	0.80%	21	0.011	0.007	0.690	0.03	10.830	0.1	1.6
2355.1	2355	689.74	2356	685.29	546.70	0.80%	21	0.011	0.008	0.710	0.03	10.919	0.1	1.7
2356.1	2356	685.29	7	683.56	132.50	1.30%	21	0.011	0.008	0.710	0.03	13.829	0.1	1.7
2357.1	2357	712.81	2358	709.57	172.80	1.90%	8	0.011	0.000	0.000	0.00	1.264	0.0	0.0
2358.1	2358	709.57	2359	708.83	217.40	0.30%	8	0.011	0.000	0.000	0.00	0.539	0.0	0.0
2359.1	2359	708.83	2360	707.53	353.80	0.40%	8	0.011	0.006	0.730	0.13	0.560	1.1	19.3
2360.1	2360	707.53	1277	706.71	210.40	0.40%	8	0.011	0.006	0.740	0.04	0.576	1.1	5.7
2361.1	2361	665.44	2362	663.91	197.80	0.80%	8	0.012	0.000	0.000	0.00	0.744	0.0	0.0
2362.1	2362	663.91	1237	662.26	309.10	0.50%	8	0.012	0.019	1.000	0.09	0.618	3.1	13.9
2363.1	2363	650.81	419	649.70	145.10	0.80%	21	0.011	6.940	7.230	1.04	10.584	65.6	59.3
2364.1	2364	742.40	314	741.43	173.90	0.60%	6	0.013	0.344	2.710	0.50	0.271	127.0	100.0

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2365.1	2365	719.25	2367	718.23	183.10	0.60%	6	0.015	0.006	0.690	0.03	0.235	2.5	5.6
2366.1	2366	717.37	217	716.49	176.30	0.50%	6	0.015	0.013	0.940	0.07	0.222	5.9	13.5
2367.1	2367	718.23	2366	717.37	171.80	0.50%	6	0.015	0.007	0.770	0.04	0.222	3.2	8.6
2368.1	2368	702.68	2369	698.46	210.00	2.00%	8	0.011	0.001	0.530	0.00	1.308	0.1	0.6
2369.1	2369	698.46	2256	691.60	300.30	2.30%	8	0.011	0.004	0.630	0.02	1.395	0.3	2.8
2370.1	2370	701.63	2369	698.46	475.20	0.70%	8	0.011	0.002	0.540	0.18	0.754	0.2	27.1
2371.1	2371	701.24	567	687.05	127.60	11.10%	8	0.011	0.000	0.210	0.00	3.078	0.0	0.4
2372.1	2372	703.76	2370	701.63	411.30	0.50%	8	0.011	0.000	0.210	0.00	0.664	0.0	0.4
2373.1	2373	754.67	302	753.30	280.70	0.50%	8	0.011	0.009	0.810	0.19	0.645	1.3	27.8
2374.1	2374	771.26	2285	770.85	60.60	0.70%	8	0.011	0.009	0.750	0.04	0.759	1.1	5.7
2375.1	2375	772.23	2374	771.26	175.00	0.60%	8	0.011	0.006	0.730	0.04	0.687	0.9	5.4
2376.1	2376	777.06	2375	772.23	58.90	8.20%	8	0.011	0.006	0.630	0.02	2.644	0.2	2.5
2377.1	2377	778.26	2376	777.06	145.80	0.80%	8	0.011	0.006	0.650	0.02	0.837	0.7	3.1
2378.1	2378	777.95	2379	775.00	203.80	1.40%	8	0.011	0.000	0.280	0.00	1.110	0.0	0.4
2379.1	2379	775.00	2374	771.26	112.20	3.30%	8	0.011	0.001	0.530	0.00	1.685	0.1	0.6
2380.1	2380	779.36	2377	778.26	303.90	0.40%	8	0.011	0.002	0.640	0.02	0.555	0.4	3.7
2381.1	2381	780.00	2380	779.36	61.30	1.00%	8	0.011	0.002	0.540	0.01	0.944	0.2	0.8
2382.1	2382	791.76	2381	780.00	317.40	3.70%	8	0.011	0.000	0.280	0.00	1.777	0.0	0.4
2383.1	2383	786.98	2377	778.26	215.00	4.10%	8	0.011	0.001	0.530	0.00	1.859	0.0	0.6
2384.1	2384	671.03	2385	670.07	266.70	0.40%	8	0.011	0.000	0.320	0.10	0.554	0.0	14.8
2385.1	2385	670.07	2386	668.99	298.20	0.40%	8	0.011	0.001	0.530	0.00	0.556	0.2	0.7
2386.1	2386	668.99	2387	668.45	128.90	0.40%	8	0.011	0.002	0.560	0.01	0.597	0.4	1.5
2387.1	2387	668.45	2388	660.83	397.00	1.90%	8	0.011	0.002	0.560	0.55	1.279	0.2	83.1
2388.1	2388	660.83	2389	660.24	145.20	0.40%	8	0.011	0.002	0.560	0.01	0.588	0.4	1.3
2389.1	2389	660.24	2390	659.30	246.60	0.40%	8	0.011	0.002	0.540	0.01	0.570	0.4	0.8
2390.1	2390	659.30	2395	659.10	30.70	0.70%	8	0.011	0.002	0.560	0.01	0.745	0.3	1.4
2391.1	2391	655.23	2392	653.33	528.20	0.40%	8	0.011	0.002	0.550	0.01	0.554	0.4	0.8
2392.1	2392	653.33	682	652.54	311.80	0.30%	15	0.011	0.085	1.230	0.18	2.484	3.4	14.2
2393.1	2393	656.79	2391	655.23	429.20	0.40%	8	0.011	0.002	0.570	0.01	0.556	0.4	1.7
2394.1	2394	657.76	2393	656.79	255.30	0.40%	8	0.011	0.002	0.620	0.12	0.569	0.4	17.8
2395.1	2395	659.10	2394	657.76	365.20	0.40%	8	0.011	0.002	0.570	0.11	0.559	0.4	16.1
2396.1	2396	682.59	2397	682.11	141.90	0.30%	8	0.011	0.000	0.000	0.00	0.537	0.0	0.0
2397.1	2397	682.11	2398	681.91	158.10	0.10%	8	0.011	0.000	0.000	0.00	0.328	0.0	0.0
2398.1	2398	681.91	2399	681.47	143.00	0.30%	8	0.011	0.000	0.000	0.00	0.512	0.0	0.0
2399.1	2399	681.47	2400	681.03	229.70	0.20%	8	0.011	0.000	0.000	0.00	0.404	0.0	0.0
2400.1	2400	681.03	2401	680.04	261.50	0.40%	8	0.011	0.000	0.000	0.10	0.568	0.0	14.9
2401.1	2401	680.04	2403	678.79	337.00	0.40%	8	0.011	0.146	1.880	0.25	0.562	26.0	37.6
2402.1	2402	681.12	2401	680.04	286.80	0.40%	8	0.011	0.000	0.000	0.11	0.566	0.0	16.2
2403.1	2403	678.79	983	677.81	287.70	0.30%	8	0.011	0.146	1.820	0.35	0.539	27.1	53.2
2404.1	2404	708.24	242	707.55	118.20	0.60%	4	0.015	0.000	0.000	0.00	0.082	0.0	0.0

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2405.1	2405	706.17	241	705.55	102.70	0.60%	6	0.015	0.000	0.000	0.00	0.244	0.0	0.0
2406.1	2406	704.65	239	697.70	284.90	2.40%	6	0.015	0.068	1.750	0.50	0.491	13.8	100.0
2407.1	2407	718.10	2408	717.28	143.70	0.60%	6	0.011	0.000	0.000	0.00	0.324	0.0	0.0
2408.1	2408	717.28	2409	715.70	296.50	0.50%	6	0.011	0.000	0.000	0.16	0.313	0.0	31.6
2409.1	2409	715.70	2410	713.90	340.20	0.50%	6	0.011	0.000	0.000	0.00	0.312	0.0	0.0
2410.1	2410	713.90	2347	705.65	16.20	51.10%	8	0.011	0.002	0.540	0.01	6.596	0.0	0.8
2413.1	2413	781.07	2415	778.18	114.40	2.50%	8	0.011	0.000	0.000	0.00	1.467	0.0	0.0
2414.1	2414	785.87	2415	778.18	211.60	3.60%	8	0.011	0.000	0.000	0.00	1.760	0.0	0.0
2415.1	2415	778.18	2135	775.60	168.60	1.50%	8	0.011	0.000	0.000	0.00	1.142	0.0	0.0
2416.1	2416	728.09	1936	722.77	79.10	6.70%	12	0.011	0.223	2.860	0.13	7.056	3.2	12.7
2417.1	2417	730.89	2416	728.09	293.70	1.00%	12	0.011	0.223	2.950	0.49	2.657	8.4	48.6
2418.1	2418	735.11	2417	730.89	341.30	1.20%	12	0.011	0.222	3.190	0.19	3.026	7.3	19.3
2419.1	2419	738.67	2418	735.11	343.00	1.00%	12	0.011	0.221	3.030	0.20	2.772	8.0	20.1
2420.1	2420	741.92	2419	738.67	314.80	1.00%	12	0.011	0.220	3.020	0.20	2.765	8.0	20.1
2421.1	2421	745.15	2420	741.92	301.70	1.10%	12	0.011	0.220	3.060	0.20	2.816	7.8	19.9
2422.1	2422	750.65	2004	745.38	102.20	5.20%	12	0.011	0.000	0.000	0.00	6.180	0.0	0.0
2423.1	2423	748.76	2421	745.15	359.00	1.00%	12	0.011	0.219	3.010	0.46	2.729	8.0	45.8
2424.1	2424	751.59	2423	748.76	359.90	0.80%	12	0.011	0.218	2.750	0.42	2.413	9.0	41.5
2425.1	2425	753.54	2424	751.59	249.20	0.80%	12	0.011	0.217	2.740	0.41	2.407	9.0	40.8
2426.1	2426	754.21	2425	753.54	79.20	0.80%	12	0.011	0.217	2.820	0.21	2.503	8.7	20.9
2427.1	2427	760.73	2005	759.05	463.80	0.40%	8	0.011	0.000	0.000	0.09	0.556	0.0	14.0
2428.1	2428	683.66	715	676.49	208.00	3.40%	8	0.011	0.001	0.520	0.00	1.714	0.0	0.6
2429.1	2429	685.08	727	676.28	319.40	2.80%	8	0.011	0.001	0.530	0.00	1.532	0.1	0.7
2431.1	2431	778.76	2432	776.10	354.70	0.70%	8	0.011	0.003	0.580	0.20	0.799	0.4	30.3
2432.1	2432	776.10	904	768.75	42.30	17.40%	8	0.011	0.018	0.780	0.03	3.847	0.5	4.3
2434.1	2434	649.61	2242	636.41	279.70	4.70%	8	0.011	0.009	0.700	0.67	2.005	0.4	100.0
2435.1	2435	673.69	2129	672.15	424.90	0.40%	8	0.011	0.218	2.150	0.31	0.556	39.2	46.0
2436.1	2436	683.21	1266	682.44	114.40	0.70%	12	0.011	0.047	1.340	0.12	2.233	2.1	12.1
2437.1	2437	701.89	2064	698.82	501.50	0.60%	12	0.012	2.629	5.180	1.00	1.952	134.7	100.0
2438.1	2438	651.80	970	651.42	100.50	0.40%	10	0.011	0.509	2.850	0.42	1.029	49.5	50.5
2439.1	2439	727.00	1455	701.70	347.50	7.30%	8	0.011	0.000	0.000	0.00	2.491	0.0	0.0
2440.1	2440	715.00	1480	712.60	148.40	1.60%	8	0.011	0.000	0.000	0.00	1.174	0.0	0.0
2441.1	2441	682.31	2220	677.47	238.00	2.00%	8	0.011	0.091	1.860	0.13	1.316	6.9	19.7
2442.1	2442	666.41	1068	665.15	257.50	0.50%	8	0.011	0.139	2.050	0.35	0.646	21.5	52.9
2443.1	2443	724.26	172	723.21	301.50	0.30%	8	0.015	0.380	1.930	0.54	0.399	95.1	81.3
2444.1	2444	730.60	1051	724.55	362.50	1.70%	8	0.012	0.000	0.000	0.43	1.093	0.0	64.8
2445.1	2445	701.58	582	701.58	68.60	0.00%	8	0.011	0.000	0.000	0.14	0.000	(N/A)	20.7
2446.1	2446	703.20	2445	701.58	296.20	0.50%	8	0.011	0.000	0.000	0.16	0.683	0.0	24.3
2447.1	2447	704.56	2446	703.20	392.10	0.30%	8	0.011	0.000	0.000	0.10	0.544	0.0	14.6
2448.1	2448	705.62	2447	704.56	256.50	0.40%	8	0.011	0.000	0.000	0.11	0.593	0.0	15.9

Appendix 1.3

Existing System Design Storm Model Results During Peak Flows														
Line ID	Start Node ID	Upstream Invert Elevation (ft)	Stop Node ID	Downstream Invert Elevation (ft)	Pipe Length (ft)	Slope	Diameter (in)	Manning's n	Flow (MGD)	Velocity (ft/s)	Mid-Pipe Depth (ft)	Full Pipe Capacity (MGD)	Flow / Capacity (%)	Depth/Rise (%)
2449.1	2449	702.90	755	702.00	296.80	0.30%	8	0.011	0.000	0.000	0.09	0.508	0.0	13.5
2450.1	2450	704.63	2449	702.90	320.90	0.50%	8	0.011	0.000	0.000	0.00	0.678	0.0	0.0
2451.1	2451	712.58	2475	708.01	474.50	1.00%	8	0.011	0.000	0.000	0.25	0.906	0.0	38.1
2452.1	2452	677.09	958	675.09	397.00	0.50%	8	0.011	0.000	0.000	0.14	0.655	0.0	21.4
2453.1	2453	687.55	2452	677.09	165.30	6.30%	8	0.011	0.000	0.000	0.00	2.322	0.0	0.0
2454.1	2454	690.40	2453	687.55	419.00	0.70%	8	0.011	0.000	0.000	0.00	0.761	0.0	0.0
2455.1	2455	698.25	2454	690.40	312.10	2.50%	8	0.011	0.000	0.000	0.00	1.464	0.0	0.0
2456.1	2456	734.86	2359	708.83	49.40	52.70%	6	0.011	0.006	0.590	0.01	3.110	0.2	1.8
2457.1	2457	737.43	2456	734.86	69.40	3.70%	6	0.011	0.006	0.630	0.02	0.825	0.7	3.5
2458.1	2458	744.96	2457	737.43	433.10	1.70%	6	0.011	0.000	0.000	0.00	0.565	0.0	0.0
2459.1	2459	746.32	2458	744.96	90.80	1.50%	6	0.011	0.000	0.000	0.00	0.525	0.0	0.0
2460.1	2460	673.54	2264	670.40	262.70	1.20%	8	0.011	0.068	1.110	0.33	1.009	6.8	49.5
2461.1	2461	674.30	2460	673.54	132.60	0.60%	8	0.011	0.052	1.410	0.15	0.699	7.4	22.0
2462.1	2462	678.53	2461	674.30	253.10	1.70%	8	0.011	0.014	0.860	0.47	1.193	1.1	71.1
2463.1	2463	684.03	2462	678.53	164.00	3.40%	8	0.011	0.007	0.640	0.02	1.690	0.4	2.8
2464.1	2464	688.86	2463	684.03	144.70	3.30%	8	0.011	0.000	0.000	0.00	1.686	0.0	0.0
2465.1	2465	682.68	2466	680.26	117.70	2.10%	8	0.011	0.000	0.000	0.00	1.323	0.0	0.0
2466.1	2466	680.26	2467	675.75	111.60	4.00%	8	0.011	0.006	0.640	0.02	1.856	0.3	2.9
2467.1	2467	675.75	2461	674.30	271.10	0.50%	8	0.011	0.038	1.180	0.28	0.675	5.7	41.9
2468.1	2468	676.45	2467	675.75	122.50	0.60%	8	0.011	0.032	1.080	0.13	0.698	4.6	18.8
2469.1	2469	677.67	2468	676.45	221.40	0.60%	8	0.011	0.022	1.020	0.10	0.685	3.1	14.9
2470.1	2470	678.42	2469	677.67	102.70	0.70%	8	0.011	0.014	0.880	0.05	0.789	1.7	8.2
2471.1	2471	679.22	2470	678.42	112.10	0.70%	8	0.011	0.014	0.880	0.06	0.780	1.7	8.3
2472.1	2472	680.18	2471	679.22	136.70	0.70%	8	0.011	0.010	0.780	0.04	0.774	1.3	6.2
2473.1	2473	684.59	2472	680.18	118.00	3.70%	8	0.011	0.002	0.540	0.01	1.784	0.1	0.8
2474.1	2474	682.66	2472	680.18	148.70	1.70%	8	0.011	0.000	0.000	0.00	1.192	0.0	0.0
2475.1	2475	708.01	2449	702.90	437.10	1.20%	8	0.011	0.000	0.000	0.00	0.998	0.0	0.0
2476.1	2476	656.02	961	655.67	58.10	0.60%	8	0.011	0.112	2.030	0.20	0.717	15.6	29.3
2477.1	2477	648.54	611	647.34	221.30	0.50%	10	0.012	0.572	3.120	0.43	1.130	50.7	51.6
2478.1	2478	778.73	2164	778.29	836.40	0.10%	8	0.013	0.084	0.560	0.42	0.179	46.7	62.7
2479.1	2479	781.50	LS_BMS	780.83	414.40	0.20%	8	0.013	0.157	0.690	0.67	0.314	49.8	100.0
3343.1	334	695.20	375	692.37	135.60	2.10%	10	0.015	1.567	4.440	0.83	1.773	88.4	100.0
CO-1	2100	657.90	W-4	657.80	12.10	0.80%	12	0.013	0.015	0.210	0.20	2.090	0.7	20.2
CO-10	MH-10	742.80	1982	738.59	1216.00	0.30%	8	0.013	0.185	1.770	0.31	0.460	40.3	47.2

Burgess & Niple, Inc.
Civil / Environmental Engineers and Planners
4029 Capital of Texas Hwy., Suite 220
Austin , Texas 78701
512.306.9266
www.burgessniple.com