City of

Folsom Plan Area

Wastewater Master Plan Update

FINAL

September 2014

WATERWORKS ENGINEERS

Table of Contents

List of Tables

List of Figures

List of Abbreviations

AF	Average Flow
City	City of Folsom
DF	Design Flow
DPM	City of Folsom Design and Procedures Manual
EID	El Dorado Irrigation District
ESD	Equivalent Single Family Dwelling Unit
FPA	Folsom Plan Area
FPASP	Folsom Plan Area Specific Plan
GIS	Geographic Information System
gpd	Gallons Per Day
GWI	Ground Water Infiltration
HGL	Hydraulic Grade Line
M&S	MacKay & Somps Civil Engineers, Inc.
Master Plan	wastewater master plan
MGD	Million Gallons Per Day
PAF	Peaked Average Flow
PF	Peaking Factor
SRCSD	Sacramento Regional County Sanitation District
SSO	Sanitary Sewer Overflow
WWIP	Wastewater Infrastructure Plan

1 Introduction

This document is a wastewater master plan (Master Plan) update for the future Folsom Plan Area (FPA).

1.1 Purpose and Objective

1.1.1 Existing Conditions / Previous Studies

The Folsom Plan Area Specific Plan (FPASP) was adopted by the City of Folsom (City) on June 28, 2011. The main goal of the FPASP is to establish a framework for logical and orderly growth within the FPA based on proposed and approved land use. Section 4 of the FPASP identifies and describes the approved land uses and zoning for the FPA. These land uses, which are discussed in more detail in Section 2.1, are the basis for sizing public utility infrastructure in the FPA, including wastewater.

Appendix K1, Wastewater Infrastructure Plan (WWIP) dated September 16, 2008, and Appendix K2, WWIP – Addendum 1 dated December 16, 2008, of the FPASP were prepared by MacKay & Somps Civil Engineers, Inc. (M&S). The WWIP identifies sewer sheds and wastewater flows; sizes backbone and internal trunk sewers; demonstrates ability to gravity serve the majority of the FPA; and provides a basis for developing Level 2 and 3 FPA Wastewater Master Plans. Addendum 1 to the WWIP was produced in response to minor changes to the land use plan for the FPA, which were subsequently approved with the 2011 FPASP.

Over the course of time since adoption of the FPASP and associated WWIP Appendices, minor changes to development phasing and grading resulted in opportunities to enhance the layout of the Wastewater Collection System to more efficiently serve the FPA. An updated FPA Grading Plan was prepared by M&S and includes proposed road elevations at intersections, road grade changes between intersections, and bridge surface and bottom elevations. The latest FPA Grading Plan is the basis by which this Master Plan Update backbone wastewater collection system is developed to ensure service to all parcels while meeting all required design criteria.

1.1.2 Objectives

The purpose of this Master Plan is to describe the design criteria, hydraulic modeling, and sewer system improvements to meet the sewage collection and conveyance demands of the approved FPASP Land Use. The Master Plan is an update to what has been presented in the WWIP and the aforementioned documents form the basis for the analysis presented herein.

1.2 Background

The FPA is a comprehensively planned community that is comprised of a mix of residential, commercial, employment and public uses complemented by recreational amenities including a significant system of parks and open spaces, all within close proximity to one another. The FPA encompasses approximately 3,513 acres, and is located in the southern portion of the City of Folsom. It is bounded by Highway 50 to the north, Prairie City Road to the west, White Rock Road to the south, and the Sacramento/El Dorado County line to the east. This boundary is depicted below in Figure 1. Figure 2 shows the FPA within a regional context.

Figure 1 – FPA Boundary

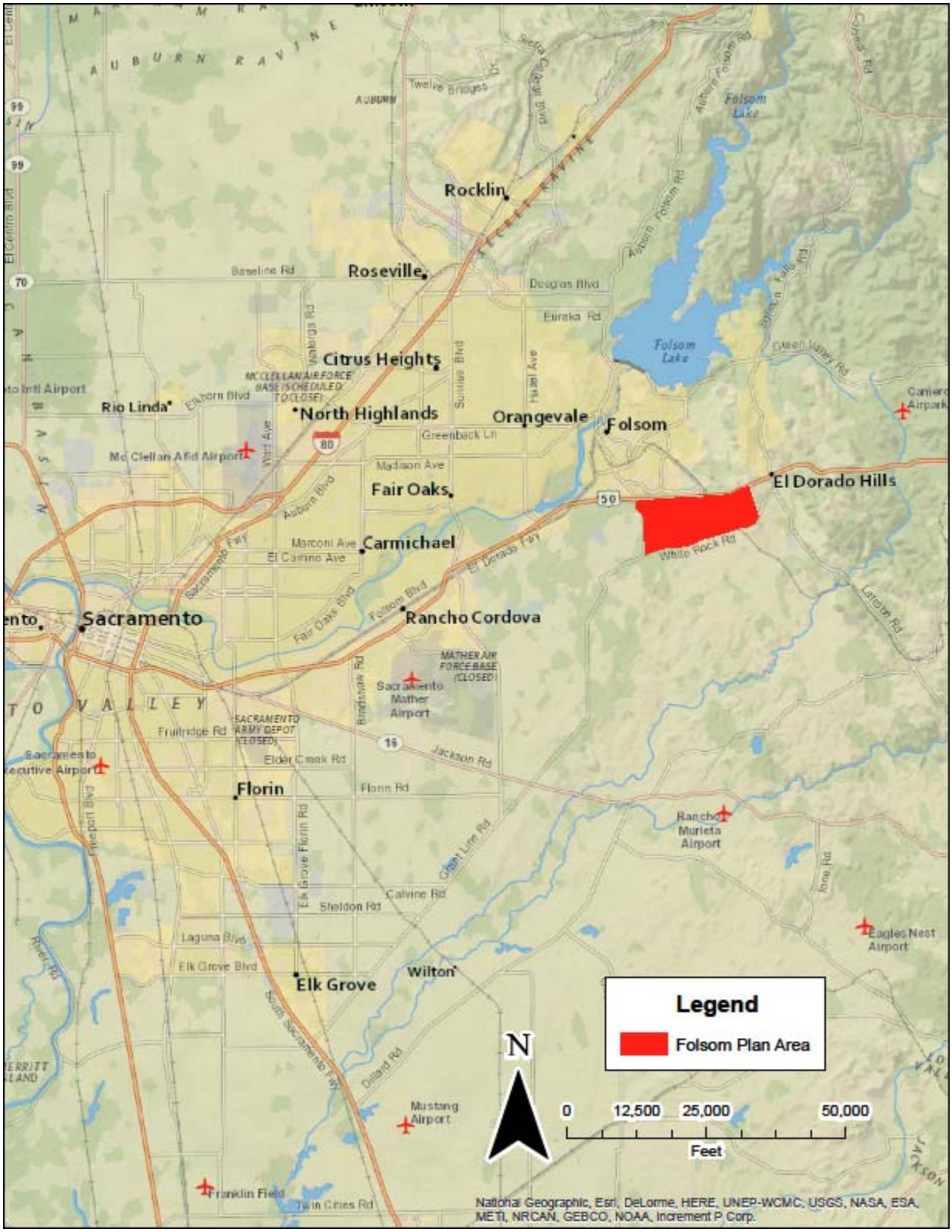

Figure 2 – FPA Regional Context

1.3 System Description

The portion of FPA's sanitary sewer system at build-out that is served by the City of Folsom is comprised of gravity mains ranging from 8 to 30 inches in diameter, with the total length of approximately 89,500 feet. This is discussed in more detail in Section 3.3. The system was designed to convey the design flow that would be seen at build-out of the FPA, with the total volume of design flow equaling 14.31 million gallons per day (MGD). This is discussed in more detail in Section 3.1.3. The total contributing amount of equivalent single family dwelling units (ESDs) to the design flow is 15,554. Each of the parcels that contain the aforementioned ESDs is located in one of three major sewer sheds identified for the FPA. The Easton Valley Parkway, Prairie City Road, and Street A/Oak Avenue sewer sheds are illustrated on Figure 3 below. A small zone in the northeast of the FPA wastewater service area is server by El Dorado Irrigation District (EID) and is not analyzed as part of this Master Plan Update.

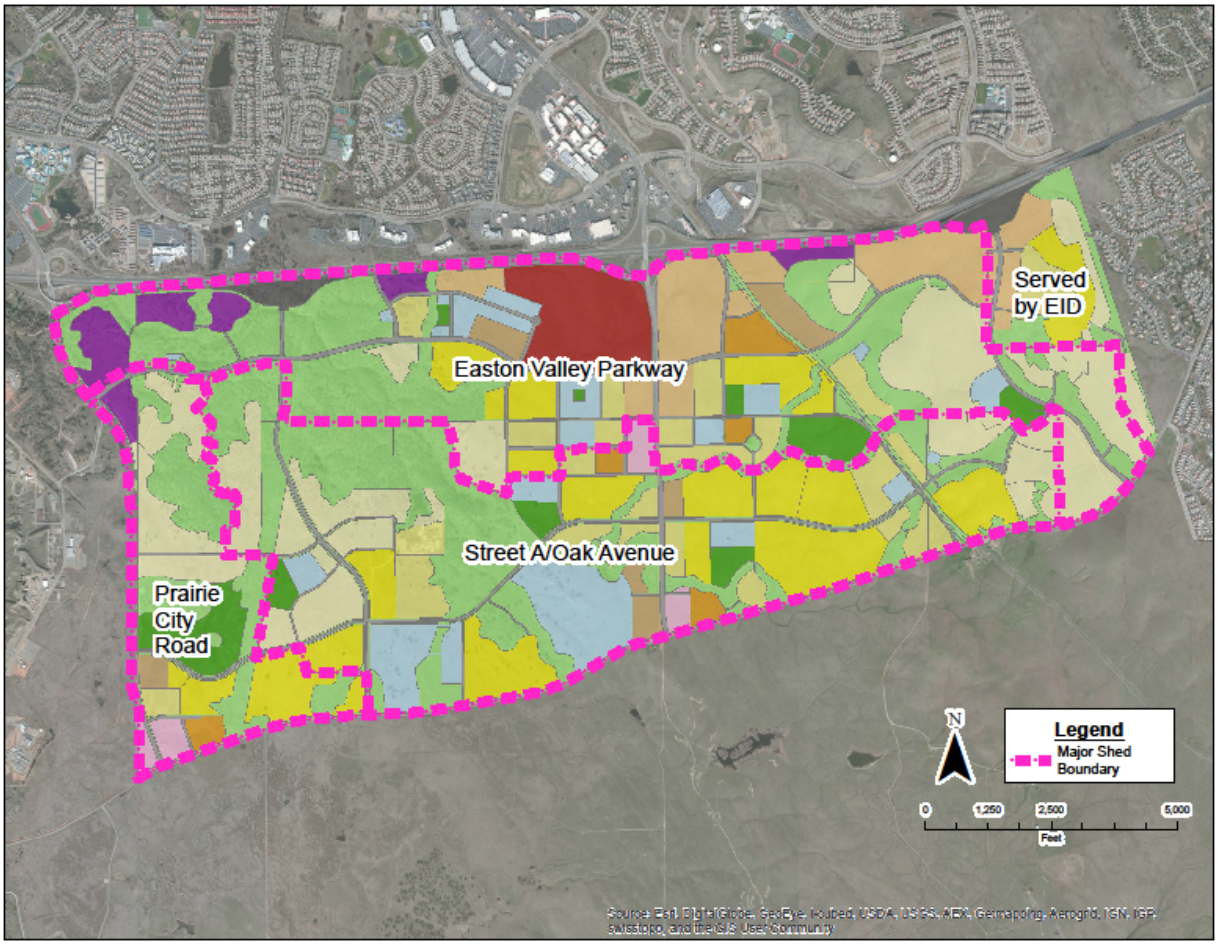

Figure 3 – Major Sewer Sheds

2 Design Criteria

2.1 Land Use

Section 4 of the FPASP describes the various land use designations proposed and approved in the FPA, along with the objectives and policies that are used to guide the FPA's development. The key policies related to land use (and associated wastewater generation rates) are as follows:

- ✓ As established by the FPASP, the total number of dwelling units for the FPA shall not exceed 10,210. The number of units within individual residential land use parcels may vary, so long as the number of units falls within the allowable density range for that land use designation.
- ✓ Transfer of dwelling units is permitted between residential parcels as long as 1) the maximum density within each land use category is not exceeded unless rezoned, and 2) the overall FPASP dwelling unit maximum (10,210) is not exceeded.
- ✓ The transfer of commercial intensity is permitted as provided in Subsection 4.10 of the FPASP.
- ✓ Thirty percent (30%) of the FPA shall be preserved and maintained as natural open space, consistent with Article 7.08.C of the Folsom City Charter.
- ✓ The open space land use designation shall provide for the permanent protection of preserved wetlands.
- ✓ All Public/Quasi-Public sites shown on Figures 4.1 and 4.2 of the FPASP may be relocated or abandoned as a minor administrative modification of the FPASP. The land use and zoning of the vacated site or sites will revert to the lowest density adjacent residential land use. In no event shall the maximum number of FPA residential units exceed 10,210.

Unique land use designations have been provided within the FPASP that are utilized to implement the objectives and policies. These designations provide multiple residential, employment and retail opportunities, as well as open space areas, parks, schools, and other public uses. FPA land uses are as follows:

Residential Land Uses

1. Single Family (SF)
2. Single Family High Density (SFHD)
3. Multi-Family Low Density (MLD)
4. Multi-Family Medium Density (MMD)
5. Multi-Family High Density (MHD)

Non-Residential Land Uses

6. Mixed-Use (MU)
7. Industrial/Office Park (IND/OP)
8. Community Commercial (CC)
9. General Commercial (GC)
10. Regional Commercial (RC)
11. Open Space (OS)
12. Parks/Recreation (P)
13. Public/Quasi-Public (PQP)

Table 1 below is a summary of total area (acres) and dwelling units (EDUs) by FPA land use type.

Table 1 – FPA Land Use Summary

	Land Use	Area (Acres)	Dwelling Units (ESDs)
1	SF	580.6	1714
2	SFHD	492.0	2657
3	MLD	263.5	2153
4	MMD	68.5	921
5	MHD	51.0	939
6	MU	59.1	1041
7	IND_OP	89.2	1723
8	CC	39.3	879
9	GC	212.9	2390
10	RC	110.8	610
11	OS	1016.0	0
12	P	125.1	47
13	PQP	184.4	480
		TOTAL	**15554**

Each parcel's land use designation is illustrated below on Figure 4.

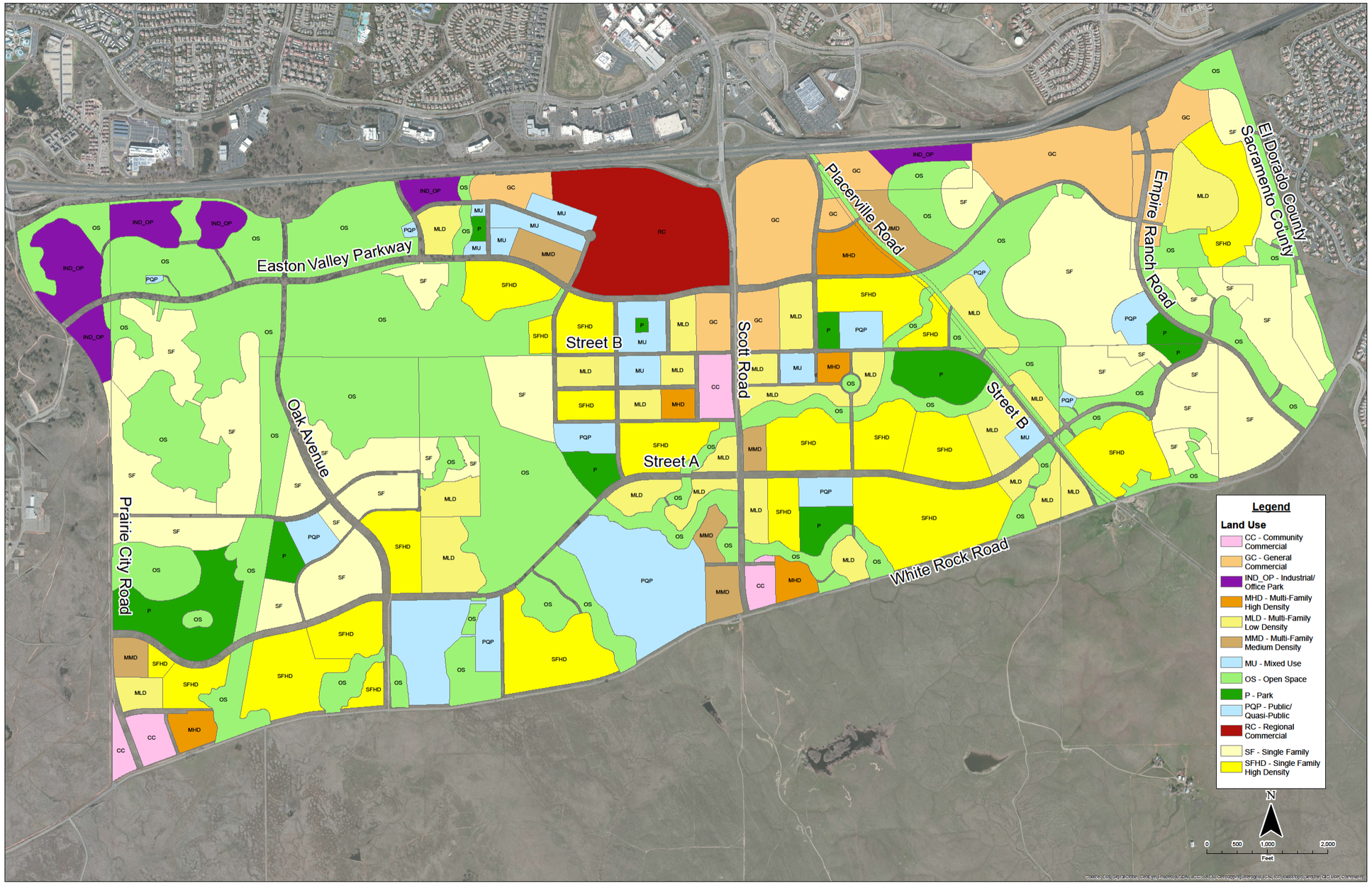

Figure 4 – Land Use

2.2 Sewer Flow Generation Rates

Average flow (AF) calculations were based on the land uses and areas as shown in the FPASP. Each parcel within the FPA was allocated a certain number of ESDs, which was then multiplied by 400 gallons per day per ESD as set forth in the City's Design and Procedures Manual (DPM), dated July 2012. This calculation resulted in each parcel's contributing flow to the collection system in gallons per day (gpd).

Design flow (DF), or peak wet weather flow, calculations involved the average flows, a peaking factor (PF), and average ground water infiltration as set forth in the DPM. Figure 5 below (excerpted from the DPM) is used to determine the PF by which all parcels' AF is multiplied by to calculate DF. Then an average ground water infiltration (GWI) rate of 50 gallons per day per inch diameter per mile is added to this value to obtain the design flow.

These wastewater flows are discussed in more detail in Section 3.1.3.

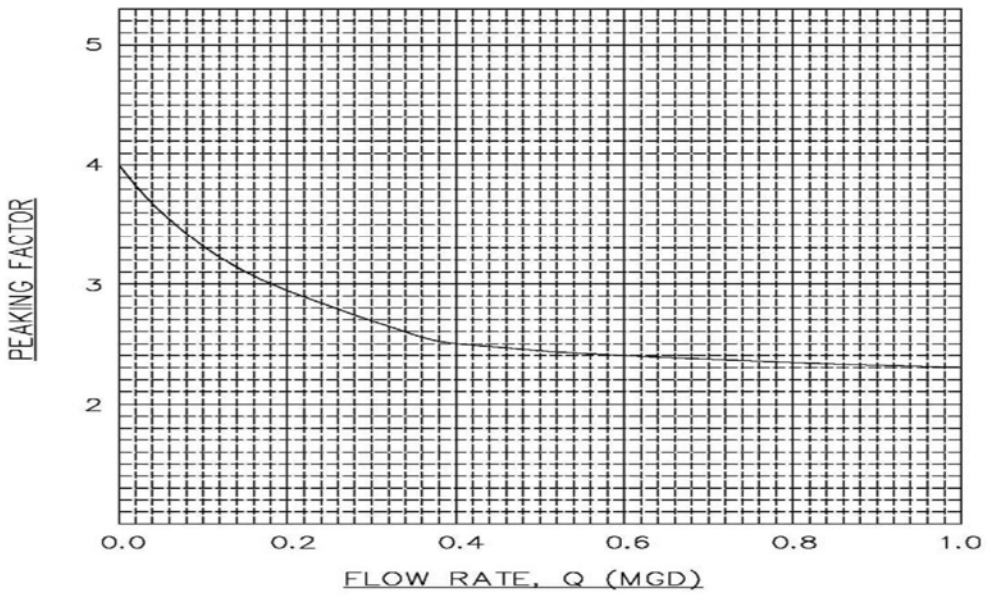

Figure 5 – Peaking Factor Graph

2.3 Pipe Sizing & Slopes

Pipe sizes and slopes were designed in accordance with Section 18.4 of the DPM. In all cases, the size and slope of each pipe was chosen to ensure adequate capacity to carry the design flow.

Regarding pipe slopes, a minimum slope for each pipe diameter size must be achieved. Table 2 below identifies these relationships.

Table 2 – Minimum Slopes

Diameter [inches]	Absolute Minimum (Velocity = 2 fps) Slope [feet per foot]
6	0.005
8	0.0035
10	0.0025
12	0.0020
15	0.0015
18	0.0012

The slopes indicated above are based on a minimum scour velocity of two feet per second and a maximum design velocity of ten feet per second.

Manning's formula was used to determine the relation of pipe slope, design flow, flow velocity, pipe diameter, and "n" value. An "n" value of 0.013 was utilized for this hydraulic model. From Manning's formula, and knowledge of the slope, flow, "n" value, and desired velocity range, the minimum pipe diameter necessary to provide adequate capacity was derived for the collection system. When located within the City's right of way or sewer easements, the minimum sewer pipe diameter is 8 inches or larger. All FPA wastewater collection system backbone infrastructure shall be located in City right-of-way or dedicated City easements of size deemed appropriate by City to meet operation and maintenance needs of infrastructure.

3 Capacity Assessment & Results

3.1 Hydraulic Model Development

Innovyze's InfoSewer Suite 7.6 wastewater modeling software was used to model the FPA wastewater collection system. To support the hydraulic modeling effort, geographic information system (GIS) datasets were created, land use data was analyzed, and flows for each parcel were calculated and assigned to the appropriate nodes (manholes). The following sections discuss this in more detail.

3.1.1 GIS Data Creation

Various GIS datasets were developed that include pipelines (i.e. gravity mains, forcemains), manholes, lift stations, and parcels. Table 3 below lists the different kinds of model data developed for each dataset.

Table 3 – GIS Datasets

Pipelines	Manholes	Lift Stations	Parcels
Diameter	Diameter	Wet Well Diameter	Land Use Type
Length	Rim Elevation	Wet Well Depth	Flow Generation
Upstream Invert	Headloss Coefficient	Pump Capacity	Manhole Assignment
Downstream Invert	Hydraulic Loading	Pump Controls	
Friction Coefficient			

Due to the absence of an existing collection system in the FPA, shape files for pipelines and manholes were created within ArcGIS 10.1 and then imported directly into the InfoSewer model. The proposed grading plan with wastewater collection system backbone plan and profile drawings provided by M&S were the basis for the development of the GIS shape files. For modeling purposes, the lift station and forcemain design criteria GIS shape file was based on ultimate build out capacity. Detailed design of lift station and forcemain and associated phasing of construction to meet short term and long term operation and maintenance needs and responsibilities will be completed as part of lift stations specific detailed design. For additional details related to lift station phasing and sizing see Section **Error! Reference source not found.**.

3.1.2 Land Use Data Collection

The land use shape file used for the model was provided by M&S. Pertinent data was present in the shape file's attribute table, which included each parcel's number, land use type, and area in acres. In addition to this data, each parcel's centroid location in the form of x and y-coordinates was calculated and added as a data field to the land use shape file's attribute table. The calculated sewer flows, which have their own unique data field within the land use shape file, are discussed in the next section.

3.1.3 Flow Calculations for Model Scenarios

As previously discussed in Section 0, the wastewater flows were calculated based on the FPASP and the DPM. The number of ESDs for each parcel, and therefore their related wastewater flows, utilized within the model is based on the anticipated build-out for the FPA.

The average flow (AF) contributed by each parcel for each model scenario was calculated within the land use shape file. The projected build-out ESD count for each parcel from the FPASP and the flow factor of 400 gpd per ESD from the DPM were used to calculate flow for all land use types. To calculate the AF from each parcel, the following equation is used:

Equation 1

AF (gpd) = DU (ESDs) x FF (gpd/ESD)

Where:

AF = Average Flow

DU = Dwelling Units [determined in the FPASP]

FF = Flow Factor = 400 gpd/ESD

The design flow (DF), or peak wet weather flow (PWWF), for the FPA collection system is calculated in a two-step process. The first step involves each parcel's previously calculated AF and the applicable Peaking Factor (PF) chosen from Figure 3. The following equation incorporates both of these components:

Equation 2

PAF (gpd) = AF (gpd) x PF (unitless)

Where:

PAF = Peaked Average Flow

AF = Average Flow

PF = Peaking Factor (Figure 3)

The second step involves applying a GWI rate of 50 gpd per inch diameter per mile to the collection system as prescribed in the DPM. Within the InfoSewer model, infiltration can be assigned to all pipelines using the Group Editing on Domain function in the InfoSewer Edit Network toolbar. The Infiltration Type to be used for this model would be Pipe Diameter-Length. After this infiltration rate has been applied to the collection system, the DF scenario run can be completed.

The City studied 2 general scenarios with the sewer system hydraulic model:

1. Build-Out AF
2. Build-Out DF

For Scenario 1, the total volume of average flows at build-out of the FPA came out to be 6.23 MGD. For Scenario 2, the volume of design flows at build-out of the FPA totaled to 14.31 MGD.

3.1.4 "Sewer Meter" Shapefile for Flow Assignment

InfoSewer is capable of automatically applying wastewater flows to the collection system using several different methods within the Load Allocator extension. These methods are described below.

1. Polygon Intersection – The user may draw a "load area" polygon for each individual manhole, which defines the "area of influence" for that manhole, or the spatial area which contributes sewage to that manhole. These load area polygons would be generated on their own separate GIS layer. InfoSewer is also capable of automatically generating load area polygons for all manholes in the system using the Theissen Method, which evenly distributes "areas of influence" for each manhole. InfoSewer can use the load area polygons to determine the contributing land area of all parcels that are intersected by the load area polygon, and calculate the flow contributed to the manhole using the land use type of each intersected parcel, and a lookup table of wastewater flow factors based on land area.
2. Polygon Extraction – This method can be used when each separate parcel has been assigned manually to a manhole, using a data field in the land use shape file. Similar to the Polygon Intersection method, the total flow contributed to each manhole is calculated using a lookup table of wastewater flow factors based on land area.
3. Meter Summation – If "sewer meter" data is available (point shape file format with wastewater flow data fields attached), meters can be assigned to manholes with either user-defined or automatically generated Theissen "area of influence" polygons.
4. Closest Manhole / Closest Pipe – If "sewer meter" data is available, it may be automatically assigned to the closest manhole or closest pipe by InfoSewer.
5. Meter-Manhole Allocation – If "sewer meter" data is available, meters may be manually assigned to manholes. This manhole assignment is stored in a data field in the sewer meter shape file.

To assign wastewater flows (calculated as described in Section 3.1.3) from each parcel to the correct location within the hydraulic model, a shape file was generated from the land use shape file which creates a "sewer meter" for each parcel, or a point located at the centroid of the parcel. Each sewer meter contains the following data fields from the land use shape file attribute table:

1. Parcel #
2. X-coordinate
3. Y-coordinate
4. Land Use Designation
5. AF
6. PAF
7. Assigned Manhole

To allow for the use of flow assignment method 5, every sewer meter was manually assigned to the manhole upstream of the pipe segment that the associated wastewater flow would likely discharge to. Therefore, best judgment was used to determine the manhole assignment for each sewer meter (parcel). A detailed summary of each parcel and the associated size, ESDs, and assigned manhole for model flow loading is included as Table A-3 in the Appendix to this report.

3.2 Modeling

3.2.1 Gravity Mains

The modeled gravity mains within the FPA's collection system were assessed to determine the system capacity over a 24-hour period. The depth-to-diameter (d/D) ratio was calculated for each gravity main segment (i.e. manhole to manhole) every 15 minutes over the model simulation. Upon completion of the model run, the maximum d/D ratio and maximum velocity experienced during the model run duration of one day (24-hrs) is recorded for each gravity main segment. This value is used to assess the capacity of each gravity main segment based on the following requirements.

1. The maximum depth of flow at design conditions in any lateral (10-inch diameter or less) shall be 0.7 diameter. Lines 12-inches in diameter or larger may be designed to flow full unless direct sewer connections are planned, in which case 0.7 diameter maximum depth shall govern.
2. All sanitary sewer pipe shall be designed for a minimum scour velocity of two feet per second at peak flows.
3. Maximum design velocity shall not exceed ten (10) feet per second.

3.2.2 Force Mains

The information used to model the FPA's proposed forcemains included pipe diameter, pipe length, and Hazen-Williams friction factor. The flow from the connected lift station is modeled over the simulation period of 24 hours. The velocity and headloss is calculated for each time step (i.e. 15 minutes) of the simulation. Graphs showing the output of the calculated velocity and headloss are reviewed so that these values remain within expected and acceptable ranges. Detailed design of the forcemain and lift station shall be completed at a future date as part of individual lift station improvement plan approval.

3.2.3 Manholes

The manholes within the FPA's collection system were assessed to determine the risk of sanitary sewer overflows (SSO) over a 24-hour period. The unfilled depth was calculated for each manhole every 15 minutes over the model simulation. Upon completion of the model run, each time step was analyzed to see whether any manhole experienced an SSO or surcharging.

3.2.4 Lift Stations

Two City operated lift stations are anticipated in the FPA and are included in the model.

1. Easton Valley Parkway Lift Station
    a. The Easton Valley Parkway Lift Station is responsible for conveying the majority of FPA's wastewater to the Iron Point Road Pump Station (IPRPS), which is owned and operated by Sacramento Regional County Sanitation District (SRCSD). The point of connection will be the SRCSD lift station wet well; the existing 24-inch SRCSD force main; or the manhole directly upstream of the SRCSD lift station on Iron Point Road depending on discussions between the City and SRCSD. This shall be determined during detailed design of lift station. The Master Plan build-out design flow (DF) to this lift station is 14.31 MGD.

2. Russell Ranch Lift Station
    a. The Russell Ranch Lift Station is responsible for conveying wastewater collected from parcels around Empire Ranch Road to a manhole in the gravity portion of the FPA collection system Street A / Oak Avenue sewer basin. These wastewater will then flow by gravity to the Easton Valley Lift Station. The Master Plan build-out design flow (DF) to this lift station is 0.29 MGD.

Wet well dimensions, pumping capacities, and pump level controls were applied to each lift station to simulate the conveyance of the wastewater entering the station through the associated force mains to the terminating gravity manhole. Detailed design for each of these stations, and associated forcemain, shall be approved by City as part of individual project improvement plan approval process. Based on Master Plan build-out design flows, the ultimate build out design capacity for the two stations are as follows:

1. Easton Valley Parkway Lift Station = 14.5 MGD
2. Russell Ranch Lift Station = 0.3 MGD

To limit potential for operation and maintenance issues associated with ultimate design flow facilities serving limited connections during initial development, lift station storage; pumping; and forcemain sizing could be phased to accommodate actual rate of development. This is particularly true of the Easton Valley Parkway Lift Station, which is discussed in further detail in Section 3.3.2.

3.2.5 Elevations

Elevation data is critical to the accuracy of a hydraulic model of a gravity collection system. The hydraulic capacity of the components of the system is directly related to their respective invert and rim elevations. Rim elevations, invert elevations, pipe diameters, and lengths used for each pipeline and manhole in the sewer model were taken from the WWIP provided by M&S.

3.3 Approved FPA Wastewater Collection System

The scenarios previously discussed in Section 3.1.3 were modeled and analyzed to confirm the sizing and alignment of the trunk sewer pipelines and local collectors in the FPA wastewater collection system. Small revisions to the collection system pipe slopes as proposed by M&S were made as needed. The DF model scenario results governed the design of the system as prescribed in the DPM. Appendix A contains the conceptual sewer main backbone system at build-out of the FPA as well as the results of the scenario runs discussed in Section 3.1.3. Figures A-1 through A-3 show the backbone collection system with pertinent data labeled as well. As illustrated in Figures A-4 and A-5, all pipe and manhole design criteria were utilized when assessing the outcome of the Build-Out AF scenario. Figures A-6 and A-7 illustrate the results of the Build-Out DF scenario in the same fashion. Also included in Appendix A are three tables that lay out the details associated with the FPA system's manholes, pipes, and land use parcels. Table A-1 tabulates pertinent pipe details such as diameters, invert elevations, flows, velocities, etc. Table A-2 tabulates pertinent manhole details such as diameters, rim elevations, loads, etc. Table A-3 tabulates pertinent parcel details such as land use types, acreages, assigned manholes, etc.

3.3.1 Pipe (Trunk Sewer and Local Collectors)

Table 4 below summarizes the length of the FPA collection system by pipe diameter. Figure 6 – FPA Backbone Wastewater Collection System illustrate build-out alignment of the collection system color-coded by pipe diameter. Figures A-1 through A-3 in the Appendix provide detailed illustration of the entire backbone infrastructure.

Table 4 – FPA Length of Pipe by Diameter

Length of Pipe [feet]							
8" Dia.	**10" Dia.**	**12" Dia.**	**15" Dia.**	**18" Dia.**	**24" Dia.**	**30" Dia.**	**Total**
27,615	10,600	16,059	15,661	7,567	10,330	1,670	89,502

Analysis of the model results for the Build-Out DF Scenario based on the design criteria previously defined did identify three stretches of pipe within the FPA collection system that do not meet the desired velocity range as discussed in Section 3.2.1. These segments of pipe are shown as red on Figure A-7. The pipes aligned on Easton Valley Parkway have maximum velocities in excess of ten feet per second, whereas the other two stretches of pipe have maximum velocities below two feet per second.

3.3.2 EVP Lift Station / Regional Folsom South Pump Station Phasing

The Sacramento Regional County Sanitation District (SRCSD) defines "interceptor" as, in short, a sewer designed for a peak wet weather flow (PWWF) of at least 10 MGD. Facilities above this threshold are to be owned, operated and maintained by SRCSD. SRCSD, using its design criteria of 310 GPD/ESD plus a wet weather peaking flow as determined by their model, found that the FPA may generate flows above 10 MGD and has planned for service to the FPA in its Interceptor Sequencing Study as well as SRCSD's previous interceptor sewer master plan - the SRCSD Interceptor Master Plan 2000 (MP2000). SRCSD will construct, operate and maintain the Regional Folsom South Pump Station and forcemain at the site of the Easton Valley Parkway lift station and forcemain when a minimum wastewater flow volume similar to SRCSD's existing lift station found on Iron Point Road is reached. SRCSD has quantified that minimum flow as 1.9 MGD Average Dry Weather Flow (ADWF) and is planning to have the Folsom South Pump Station (FSPS) ready for service when the FPA wastewater flows reach that total. Until this threshold value is reached, the City is responsible for constructing, operating and maintaining the Easton Valley Parkway lift station and forcemain. Table 5**5** below summarizes pertinent information regarding these two phases of development/ownership and quantifies the required design capacity for the pumping station by phase.

Table 5 – EVP Lift Station / Regional Folsom South PS Ownership and Sizing

Phase	Ownership/ O&M	Average Flow (MGD)	City of Folsom Design Flow (MGD)	SRCSD PWWF (MGD)	Required Design Capacity (MGD)	Approx. ESDs
Intermediate	Folsom	1.9 (1)	4.37(3)	3.62	5.0	4,750
Build-Out	SRCSD	6.23	14.31	11.1	14.5(2)	15,554

(1) SRCSD plans to have the FSPS available for service when the FPA flows reach similar flow.
(2) SRCSD will determine actual sizing of FSPS based on SRCSD standards.
(3) Design flow phasing to reach Intermediate Phase will be as set forth in the EVP LS Preliminary Design Report.

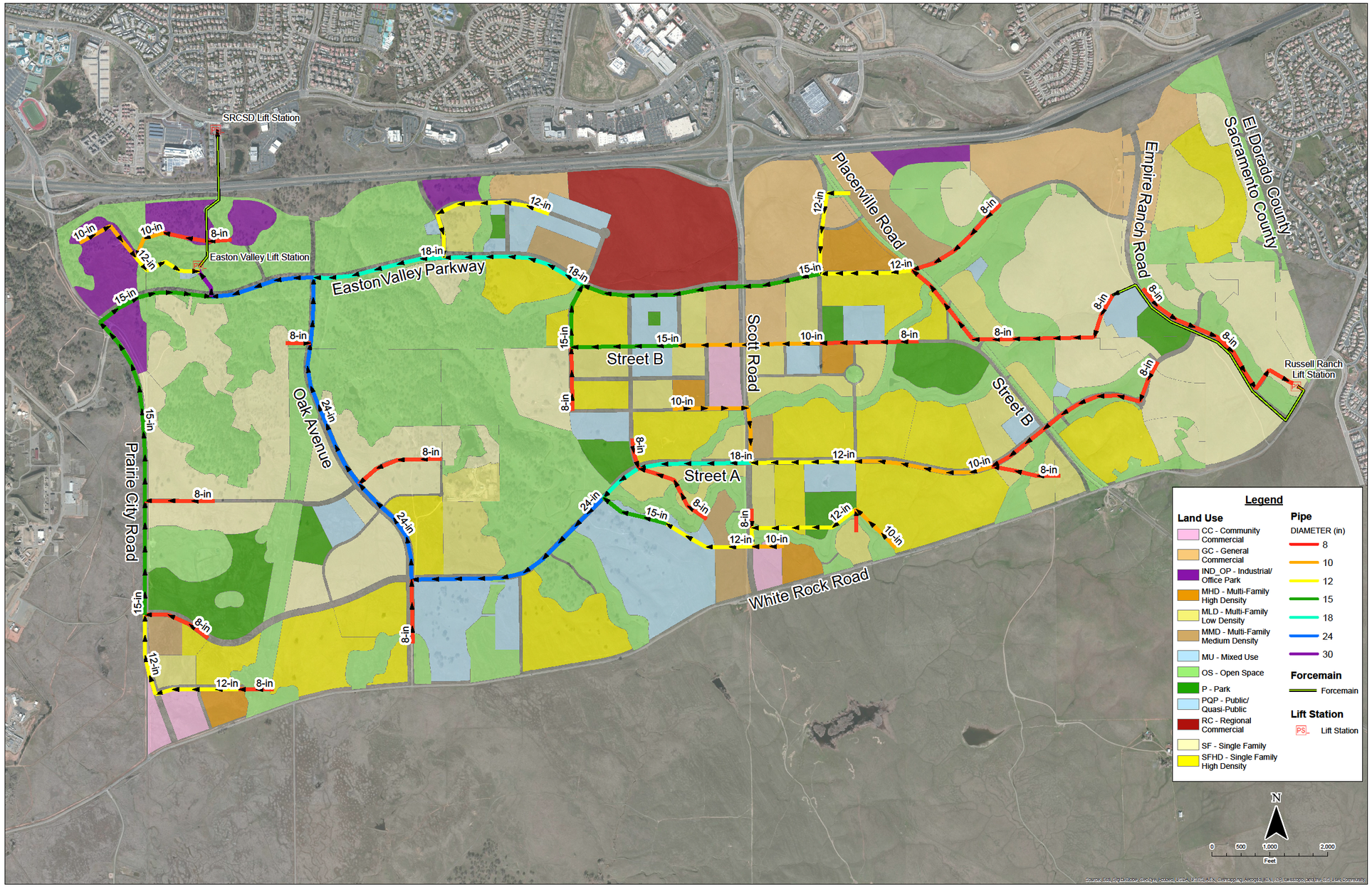

Figure 6 – FPA Backbone Wastewater Collection System

3.4 Conceptual Phasing

Phasing of development within the FPA is not finalized, but initial estimates for Phase 1 are: Westlands (840 units); Easton-Hillsborough (820 units); and Russell Ranch (350 units). Figure 7 illustrates the approximate location of these developments. In general, wherever possible build-out infrastructure will be constructed to accommodate phasing of developments, so if all three developments are constructed in parallel, the build-out wastewater collection system infrastructure, particularly the Street A/Oak Avenue trunk sewer, will be constructed. Build-out improvements are shown as solid red (Easton-Hillsborough), blue (Westlands) and green (Russell Ranch) lines on Figure 7. If parcels outside these areas, for example within the Prairie City Road sewer shed, are developed first, then the Prairie City Road trunk sewer (black line on Figure) will have to be constructed to meet demands. However, to allow for any of the identified initial developments to progress independent of each other or in various combinations with one another, this Master Plan identified and analyzed two infrastructure phasing alternatives to accommodate these conditions as summarized below.

1. Mangini Temporary Lift Station and Forcemain
2. Scott Road Diversion

3.4.1 Mangini Temporary Lift Station

The Mangini Temporary Lift Station alternative allows for the development of the upper reaches of the Street A/Oak Avenue sewer shed, in particular the Westlands units, independent of the development west of the Alder Creek crossing on Street A (Easton-Hillsborough). This alternative assumes construction of a temporary lift station at the eastern side of the Alder Creek crossing on Street A in the vicinity of the future high school site, referred to herein and on Figure 7 as the Mangini Temporary Lift Station. This phasing alternative would also include a forcemain generally aligned north along the eastern edge of the Alder Creek open space to Easton Valley Parkway and then west along Easton Valley Parkway to the Easton Valley Lift Station (or continue directly to the SRCSD lift station). The approximate location and alignment are shown as a dashed blue line on Figure 7 below.

There are three potential termination points for the forcemain, each supporting different development phasing options.

Termination Point No.1 (Illustrated on Figure 7 as the number "1" inside a circle): This termination point assumes the forcemain extends all the way to the SRCSD lift station along Iron Point Road. This option would allow initial development routed to the Mangini Temporary Lift Station to commence without waiting for other backbone infrastructure to be constructed, in particular the EVP LS. However, at minimum one of the intermediate term forcemains intended to serve the EVP LS (from EVP to the SRCSD Lift Station under Highway 50) would need to be constructed and dedicated to the temporary lift station for this termination point to be feasible. In addition, all of the forcemain from Mangini to EVP LS (which would include a dedicated forcemain crossing of Alder Creek on EVP) is redundant at build out and would have to be replaced with ultimate build-out improvements.

Termination Point No.2 (Illustrated on Figure 7 as the number "2" inside a circle): This termination point assumes the temporary forcemain extends all the way to the EVP LS. This option could reduce the required size of the Mangini Temporary LS pumps and length of the forcemain, but requires the EVP LS and forcemain(s) be constructed and operational before development upstream of Mangini would be allowed to connect to system. All of the forcemain infrastructure described as part of Termination Point No.1 discussion is still redundant and would have to be replaced with ultimate build-out improvements.

Termination Point No.3 (Illustrated on Figure 7 as the number "3" inside a circle): This termination point assumes the forcemain extends only to the top of the hill just south of Street B and assumes gravity flow from that point to Easton Valley Parkway then west to the EVP LS (generally along the dotted blue alignment to EVP and solid green alignment to EVP LS). This option could significantly reduce the required size of the Mangini Temporary LS pumps and length of the forcemain and eliminate the need for construction of redundant forcemain facilities (including the elimination of the second temporary crossing of Alder Creek on EVP). It supports the general phasing approach of building ultimate build-out facilities and utilizing those where possible, but does require all of the gravity infrastructure be built earlier than may be otherwise necessary. It should be noted that Termination Point 3 could be placed at any location along the blue dotted line between that shown on Figure 7 and the EVP Lift Station (Termination Point 2), but this would likely increase the quantity of redundant forcemain piping.

Any of these termination points could be utilized to support phasing but selection and implementation of one must receive approval by the City prior to commencement. Without approval of the proposed alternative by the City, the ultimate build out infrastructure must be constructed. Regardless of the selected termination point and given the temporary nature of these improvements, there shall be a maximum capacity of the Mangini lift station and forcemain of 1.7 MGD at design flow, which equates to approximately 1,850 ESDs. The intent of this lift station alternative is to provide temporary/short-term conveyance capacity. To ensure timely construction of build-out gravity sewer improvements along the remainder of the Street A/Oak Avenue trunk sewer, the number of ESDs approved for sewer connection flowing to the Mangini lift station shall be limited as described in Table 6 below.

Table 6 – Mangini Lift Station Time Schedule for Connected ESDs

Max ESDs connected to Mangini LS	Trigger for Next Level of Maximum ESDs
1000	Submit improvement plans for trunk sewer from the Mangini LS to EVP LS, commencing at the Mangini LS frontage then south and west along Street A to the Oak Ave intersection, then north along Oak Ave to EVP intersection, then west along EVP to the EVP LS driveway, then north along the driveway to the EVP LS wet well connection.
1250	City approves improvement plans for trunk sewer from Mangini LS to EVP LS.
1750	Commence construction of trunk sewer from Mangini LS to EVP LS.
1850	Complete construction of trunk sewer from Mangini LS to EVP LS and EVP LS and FM(s).

3.4.2 Scott Road Diversion

The Scott Road Diversion alternative (shown as a dashed green line on Figure 7) allows for the development of the upper reaches of the Easton Valley Parkway sewer shed, or the Russell Ranch units, independent of the development west of Scott Road on Easton Valley Parkway (i.e. independent of construction of permanent ultimate build out Easton Valley Parkway wastewater infrastructure from Scott Road west, that portion of the solid green line on Figure 7.) This Scott Road Diversion alternative assumes that Westlands (and potentially Easton-Hillsborough) development is moving forward and the Street A / Oak Avenue sewer shed gravity sewer lines on Scott Road and Street A are in place and either the permanent line all the way to EVP Lift Station is in place or Mangini Temporary Lift Station Alternative is operational and capacity is available. The approximate location and alignment is illustrated through a dashed green line on Figure 7 below.

The maximum capacity of the Scott Road diversion is limited by the capacity of the 10" ultimate build out gravity line on Scott Rd just upstream of Street A (show as orange line on Figure 7). At 10", the maximum design flow for the diversion is 1 MGD, which equates to 1,087 ESDs. The intent of this diversion line alternative is to provide temporary/short-term conveyance capacity so 1 MGD is expected to be sufficient, however the 10" line could be increased to 12" to provide capacity up to 2.0 MGD, which equates to 2,174 ESDs. 12" is the maximum diversion size allowed so as to maintain cleaning velocities at ultimate DF for the Scott Rd. line after the diversion is decommissioned and flow are routed down EVP trunk sewer.

To ensure timely construction of build-out gravity sewer improvements from the Scott Road Diversion (Scott and EVP intersection) to the EVP LS, the number of ESDs approved for sewer connection flowing in the Scott Road diversion line shall be limited as described in Table 7 below. Requirements for both a 10" and 12" Scott Road Diversion are provided. Either size could be utilized to support development phasing but selection and implementation of one must receive approval by the City prior to commencement. Without approval of the proposed alternative by the City, the ultimate build out infrastructure must be constructed.

Table 7 – Scott Road Diversion Time Schedule for Connected ESDs

Max ESDs connected to Mangini LS		Trigger for Next Level of Maximum ESDs
10"	12"	
500	1000	Submit improvement plans for trunk sewer from Scott Rd and EVP LS, commencing at Scott Rd. and EVP intersection west along EVP to Alder Creek crossing (for crossing at minimum provide final design of temporary crossing or final design of bridge crossing), then continue west to the EVP LS driveway (design connection to existing UBO facilities at Oak Ave and EVP intersection if already constructed), then north along the driveway to the EVP LS wet well connection.
750	1500	City approves improvement plans for trunk sewer from Scott Rd and EVP LS.
950	1900	Commence construction of trunk sewer from Scott Rd and EVP LS.
1050	2100	Complete construction of trunk sewer from Scott Rd and EVP LS

3.4.3 Odor

Development phasing will result in periods of time where there is minimal flows in backbone wastewater infrastructure pipelines. In addition, the topography of the plan area results in a wide range of pipe slopes, including relatively flat pipes in several areas. Therefore, odor control and the potential for solids deposition must be taken into account during detailed design, approval and construction of backbone infrastructure. This could result in the need for increased flushing and/or odor control during FPA development. The developer(s) will construct odor control facilities and provide high-velocity hydraulic cleaning and vacuum cleaning of select sewer lines as deemed necessary and/or as directed by City until peak average flows are met.

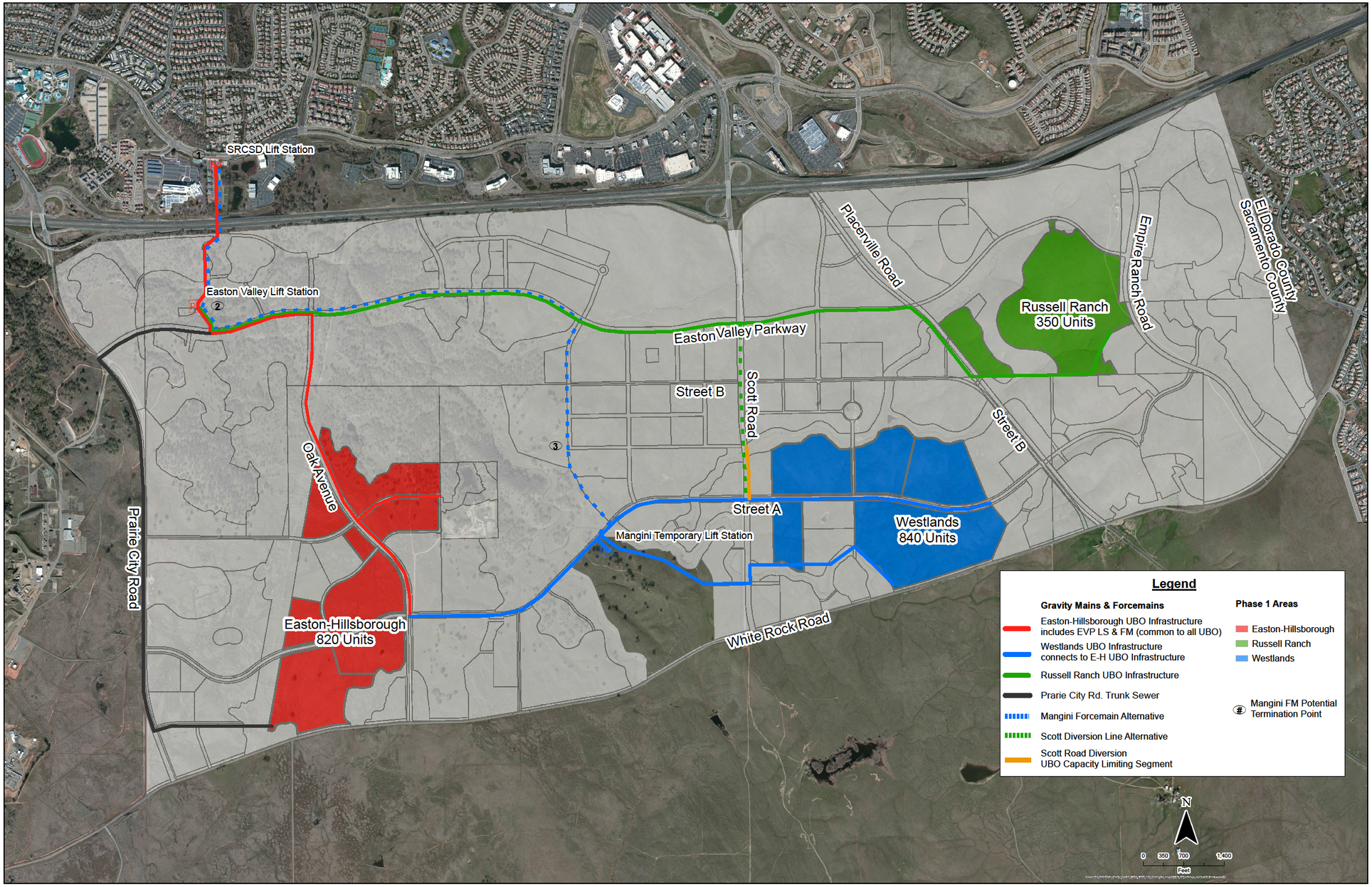

Figure 7 - Phasing

4 References

City of Folsom. Design and Procedures Manual. July 2012.

Torrence Planning. Folsom Plan Area Specific Plan. June 2011

MacKay & Somps Civil Engineers, Inc. Appendix K1, Wastewater Infrastructure Plan. September 2008

MacKay & Somps Civil Engineers, Inc. Appendix K2, WWIP Addendum 1. December 2008

Appendix A

FPA WASTEWATER COLLECTION SYSTEM BACKBONE
FIGURE A-1

Legend

Manhole
- Manhole

ANNOTATION (Manhole)

ID	H4.04
Rim Elevation [ft]	RIM 320
Depth [ft]	DEPTH 18.2

Pipe

DIAMETER (in)
- 8
- 10
- 12
- 15
- 18
- 24
- 30

ANNOTATION (Pipe)

ID	2211
Design Flow [MGD]	DF 1.1638
Slope [ft/ft]	S 0.002

Land Use
- CC - Community Commercial
- GC - General Commercial
- IND_OP - Industrial/ Office Park
- MHD - Multi-Family High Density
- MLD - Multi-Family Low Density
- MMD - Multi-Family Medium Density
- MU - Mixed Use
- OS - Open Space
- P - Park
- PQP - Public/ Quasi-Public
- RC - Regional Commercial
- SF - Single Family
- SFHD - Single Family High Density

ANNOTATION (Land Use)

Land Use Type	CC
Parcel Loading [# of ESDs]	ESD 153
Assigned Manhole	H6.0

PS

IND_OP ESD 328 C2:2

IND_OP ESD 242 C2:3

IND_OP ESD 451 C2:4

IND_OP ESD 212 C6:12

MLD ESD 96 C6.1

SF ESD 36 C6.0

IND_OP ESD 253 H3.0

SF ESD 112 H1.0

SF ESD 5 H3.06

SF ESD 130 M1.1

SF ESD 98 M2.0

SF ESD 13 M2.1

SF ESD 48 M2.0

SF ESD 57 M2.1

MLD ESD 119 M2.1

SF ESD 96 H4.0

SF ESD 81 H4.1

SF ESD 13 M2.05

SFHD ESD 137 M2.1

MLD ESD 222 M4.0

PQP ESD 40 M2.06

P ESD 1 M3.0

SF ESD 101 M3.0

P ESD 20 H5.1

SF ESD 39 M3.0

SFHD ESD 95 M3.0

MMD ESD 121 H5.01

SFHD ESD 30 H5.1

MLD ESD 95 H6.02

SFHD ESD 88 H7.0

SFHD ESD 289 H8.0

SFHD ESD 41 H8.0

MHD ESD 185 H7.0

CC ESD 243 H6.02

CC ESD 153 H6.0

Easton Valley Parkway

Oak Avenue

Prairie City Road

White Rock Road

N

0 175 350 700

Feet

Legend

Manhole

Manhole

ANNOTATION (Manhole)

ID	H4.04
Rim Elevation [ft]	RIM 320
Depth [ft]	DEPTH 18.2

Pipe

DIAMETER (in)

- 8
- 10
- 12
- 15
- 18
- 24
- 30

ANNOTATION (Pipe)

ID	2211
Design Flow [MGD]	DF 1.1638
Slope [ft/ft]	S 0.002

Land Use

- CC - Community Commercial
- GC - General Commercial
- IND_OP - Industrial/ Office Park
- MHD - Multi-Family High Density
- MLD - Multi-Family Low Density
- MMD - Multi-Family Medium Density
- MU - Mixed Use
- OS - Open Space
- P - Park
- PQP - Public/ Quasi-Public
- RC - Regional Commercial
- SF - Single Family
- SFHD - Single Family High Density

ANNOTATION (Land Use)

Land Use Type	CC
Parcel Loading [# of ESDs]	ESD 153
Assigned Manhole	H6.0

Placerville Road

Easton Valley Parkway

Street B

Scott Road

Street A

White Rock Road

FPA WASTEWATER COLLECTION SYSTEM BACKBONE
FIGURE A-2

N

0 175 350 700

Feet

FPA WASTEWATER COLLECTION SYSTEM BACKBONE
FIGURE A-3

Legend

Manhole

Manhole

ANNOTATION (Manhole)

ID	H4.04
Rim Elevation [ft]	RIM 320
Depth [ft]	DEPTH 18.2

Pipe

DIAMETER (in)

- 8
- 10
- 12
- 15
- 18
- 24
- 30

ANNOTATION (Pipe)

ID	2211
Design Flow [MGD]	DF 1.1638
Slope [ft/ft]	S 0.002

Land Use

- CC - Community Commercial
- GC - General Commercial
- IND_OP - Industrial/ Office Park
- MHD - Multi-Family High Density
- MLD - Multi-Family Low Density
- MMD - Multi-Family Medium Density
- MU - Mixed Use
- OS - Open Space
- P - Park
- PQP - Public/ Quasi-Public
- RC - Regional Commercial
- SF - Single Family
- SFHD - Single Family High Density

ANNOTATION (Land Use)

Land Use Type	CC
Parcel Loading [# of ESDs]	ESD 153
Assigned Manhole	H6.0

N

0 175 350 700

Feet

Placerville Road
Empire Ranch Road
El Dorado County
Sacramento County
EastonValleyParkway
Street B
Scott Road
Street B
Oak Avenue
Street A
Prairie City Road
White Rock Road

Legend

Manhole

Unfilled Depth [ft]

- SSO
- 0 to 1
- 1 to 3
- 3 to 6
- > 6

Pipe

Max d/D

- < 0.7
- 0.7 to 0.9
- 0.9 to 1
- > 1

N

0 200 400 800
Feet

HYDRAULIC MODEL AVERAGE FLOW RESULTS
MAXIMUM DEPTH TO DIAMETER RATIO
FIGURE A-4

Placerville Road
Empire Ranch Road
El Dorado County
Sacramento County
EastonValleyParkway
Street B
Scott Road
Street B
Oak Avenue
Street A
Prairie City Road
White Rock Road

Legend

Manhole

Unfilled Depth [ft]

- SSO
- 0 to 1
- 1 to 3
- 3 to 6
- > 6

Pipe

Max Velocity [fps]

- < 1
- 1 to 2
- 2 to 10
- > 10

N

0 200 400 800
Feet

HYDRAULIC MODEL AVERAGE FLOW RESULTS
MAXIMUM VELOCITY
FIGURE A-5

Placerville Road
Empire Ranch Road
El Dorado County
Sacramento County
EastonValleyParkway
Street B
Scott Road
Street B
Oak Avenue
Street A
Prairie City Road
White Rock Road

Legend

Manhole

Unfilled Depth [ft]

- SSO
- 0 to 1
- 1 to 3
- 3 to 6
- > 6

Pipe

Max d/D

- < 0.7
- 0.7 to 0.9
- 0.9 to 1
- > 1

N

0 200 400 800
Feet

HYDRAULIC MODEL DESIGN FLOW RESULTS
MAXIMUM DEPTH TO DIAMETER RATIO
FIGURE A-6

Placerville Road
Empire Ranch Road
El Dorado County
Sacramento County
EastonValleyParkway
Street B
Scott Road
Street B
Oak Avenue
Street A
Prairie City Road
White Rock Road

Legend

Manhole

Unfilled Depth [ft]

- SSO
- 0 to 1
- 1 to 3
- 3 to 6
- > 6

Pipe

Max Velocity [fps]

- < 1
- 1 to 2
- 2 to 10
- > 10

N

0 200 400 800
Feet

HYDRAULIC MODEL DESIGN FLOW RESULTS
MAXIMUM VELOCITY
FIGURE A-7

Table A-1

FPA MASTER PLAN UPDATE
Hydraulic Model
Table A-1: Pipe Details

PIPEID	DIAMETER NOMINAL (IN)	LENGTH - 2D MH to MH (FT)	GIS LENGTH 3D (FT)	FROM_INV ELEV (FT)	TO_INV ELEV (FT)	SLOPE (FT/FT)	MANNINGS "N" VALUE	MAX DF (MGD)	MAX VELOCITY @ DF (FPS)	MAX D/d @ DF (FT/FT)	MAX AF (MGD)	MAX VELOCITY @ AF (FPS)	MAX D/d @ AF (FT/FT)
2126	24	363	363.34	352.50	352.10	0.0011	0.013	4.19	2.696	0.715	1.82	2.224	0.424
2127	24	400	389.53	352.00	351.60	0.0010	0.013	4.19	2.585	0.744	1.82	2.146	0.435
2128	24	400	400.46	351.50	351.10	0.0010	0.013	4.23	2.588	0.750	1.84	2.151	0.438
2129	24	400	400.10	351.00	350.10	0.0022	0.013	4.24	3.593	0.564	1.84	2.893	0.351
2130	24	400	400.15	346.00	343.40	0.0065	0.013	4.69	5.484	0.438	2.04	4.357	0.281
2131	24	400	401.68	343.30	340.70	0.0065	0.013	4.69	5.484	0.438	2.04	4.357	0.281
2132	24	400	400.23	340.60	335.10	0.0138	0.013	4.69	7.208	0.357	2.04	4.296	0.284
2133	24	350	350.73	335.00	323.10	0.0340	0.013	4.69	9.981	0.282	2.04	8.016	0.183
2134	24	350	350.24	323.00	311.10	0.0340	0.013	4.69	9.981	0.282	2.04	8.082	0.182
2135	24	350	348.56	311.00	299.10	0.0340	0.013	4.69	9.981	0.282	2.04	8.082	0.182
2136	24	400	400.61	299.00	298.59	0.0010	0.013	4.69	2.642	0.816	2.04	2.210	0.464
2137	24	400	399.40	298.49	298.05	0.0011	0.013	4.81	2.718	0.813	2.09	2.224	0.471
2138	24	400	400.47	297.95	297.52	0.0011	0.013	4.81	2.718	0.813	2.09	2.224	0.471
2139	24	362	335.10	297.42	297.00	0.0011	0.013	4.81	2.789	0.791	2.09	2.308	0.457
2140	24	350	350.95	353.00	352.60	0.0011	0.013	3.94	2.709	0.674	1.71	2.218	0.406
2141	24	400	400.04	353.50	353.10	0.0010	0.013	3.94	2.563	0.709	1.71	2.112	0.421
2142	24	400	400.58	354.00	353.60	0.0010	0.013	3.94	2.563	0.709	1.71	2.112	0.421
2143	24	400	401.09	354.50	354.10	0.0010	0.013	3.94	2.563	0.709	1.71	2.112	0.421
2144	24	400	397.84	355.00	354.60	0.0010	0.013	3.94	2.563	0.709	1.71	2.112	0.421
2145	24	400	398.57	355.50	355.10	0.0010	0.013	3.51	2.511	0.651	1.53	2.047	0.395
2146	24	400	400.72	356.00	355.60	0.0010	0.013	3.51	2.511	0.651	1.53	2.047	0.395
2147	24	400	400.46	358.10	356.10	0.0050	0.013	3.51	4.612	0.401	1.53	3.652	0.259
2148	24	300	300.53	358.50	358.20	0.0010	0.013	3.51	2.511	0.651	1.53	2.047	0.395
2149	24	400	400.71	359.00	358.60	0.0010	0.013	3.51	2.511	0.651	1.53	2.047	0.395
2150	18	400	400.21	360.00	359.50	0.0013	0.013	2.21	2.390	0.754	0.96	1.988	0.439
2151	18	400	398.90	360.60	360.10	0.0013	0.013	2.21	2.390	0.754	0.96	1.988	0.439
2152	18	400	399.05	361.20	360.70	0.0013	0.013	1.80	2.311	0.645	0.78	1.883	0.392
2153	18	400	400.05	361.80	361.30	0.0013	0.013	1.80	2.311	0.645	0.78	1.883	0.392
2154	18	400	400.02	364.10	361.90	0.0055	0.013	1.80	4.049	0.413	0.78	3.209	0.266
2155	18	400	400.05	366.40	364.20	0.0055	0.013	1.80	4.049	0.413	0.78	3.210	0.266
2156	18	357	356.02	368.50	366.50	0.0056	0.013	1.80	4.076	0.411	0.78	3.231	0.265
2157	24	370	369.66	269.80	267.40	0.0065	0.013	11.71	6.629	0.812	5.09	5.272	0.344
2158	24	400	400.78	272.50	269.90	0.0065	0.013	11.71	6.637	0.811	5.09	5.297	0.343
2159	24	360	360.44	281.50	272.60	0.0247	0.013	11.71	11.397	0.505	5.09	9.233	0.230
2160	24	340	339.64	291.50	282.50	0.0265	0.013	11.71	11.693	0.495	5.09	9.668	0.306
2161	24	365	346.22	296.90	292.50	0.0121	0.013	11.71	8.646	0.633	5.09	7.089	0.384
2162	18	270	269.99	300.97	297.40	0.0132	0.013	6.90	7.734	0.729	3.00	6.736	0.414
2163	18	400	399.48	305.23	301.07	0.0104	0.013	6.90	6.929	0.815	3.00	6.705	0.415
2164	18	400	400.69	309.49	305.33	0.0104	0.013	6.90	6.929	0.815	3.00	5.775	0.465
2165	18	400	400.07	313.75	309.59	0.0104	0.013	6.90	6.929	0.815	3.00	5.775	0.465
2166	18	410	409.59	318.11	313.85	0.0104	0.013	6.90	6.929	0.815	3.00	5.775	0.465
2167	18	410	410.42	322.48	318.21	0.0104	0.013	6.90	6.929	0.815	3.00	5.775	0.465
2168	18	370	370.37	325.50	322.58	0.0079	0.013	6.01	6.040	0.813	2.62	4.888	0.475
2169	18	370	370.89	328.52	325.60	0.0079	0.013	6.01	6.040	0.813	2.62	4.817	0.481

PIPEID	DIAMETER NOMINAL (IN)	LENGTH - 2D MH to MH (FT)	GIS LENGTH 3D (FT)	FROM_INV ELEV (FT)	TO_INV ELEV (FT)	SLOPE (FT/FT)	MANNINGS "N" VALUE	MAX DF (MGD)	MAX VELOCITY @ DF (FPS)	MAX D/d @ DF (FT/FT)	MAX AF (MGD)	MAX VELOCITY @ AF (FPS)	MAX D/d @ AF (FT/FT)
2170	18	380	380.27	331.63	328.62	0.0079	0.013	6.01	6.040	0.813	2.62	4.839	0.479
2171	18	350	349.49	334.46	331.73	0.0078	0.013	5.98	6.001	0.814	2.60	4.911	0.472
2172	18	350	349.34	337.25	334.56	0.0077	0.013	5.92	5.962	0.811	2.58	4.898	0.469
2173	18	350	350.16	340.05	337.35	0.0077	0.013	5.92	5.962	0.811	2.58	4.898	0.469
2174	18	350	350.25	342.70	340.15	0.0073	0.013	5.79	5.805	0.816	2.52	4.872	0.463
2175	15	400	399.77	346.40	343.50	0.0072	0.013	3.49	5.122	0.800	1.52	4.575	0.436
2176	15	400	400.31	349.90	346.50	0.0085	0.013	3.49	5.509	0.744	1.52	4.576	0.436
2177	15	400	400.06	358.90	350.00	0.0222	0.013	3.49	8.088	0.534	1.52	6.495	0.336
2178	15	400	400.15	371.90	359.00	0.0322	0.013	3.49	9.299	0.478	1.52	7.422	0.305
2179	15	400	400.64	384.80	372.00	0.0320	0.013	2.92	8.859	0.434	1.28	7.042	0.279
2180	15	400	399.44	393.90	384.90	0.0225	0.013	2.92	7.776	0.480	1.28	6.208	0.306
2181	15	428	428.25	398.70	394.00	0.0110	0.013	2.92	5.921	0.597	1.28	4.793	0.369
2182	15	332	332.19	402.30	399.00	0.0099	0.013	2.92	5.694	0.617	1.28	4.623	0.379
2183	15	340	340.04	405.80	402.40	0.0100	0.013	2.92	5.708	0.616	1.28	4.633	0.379
2184	15	340	339.63	409.20	405.90	0.0097	0.013	2.92	5.641	0.622	1.28	4.583	0.382
2185	15	336	336.37	415.00	409.30	0.0170	0.013	2.92	6.994	0.521	1.28	5.609	0.329
2186	12	264	264.16	424.00	415.30	0.0330	0.013	1.23	7.179	0.372	0.54	5.684	0.243
2187	12	260	260.44	429.30	424.10	0.0200	0.013	1.23	5.982	0.426	0.54	4.758	0.275
2188	12	350	350.01	436.40	429.40	0.0200	0.013	1.23	5.983	0.426	0.54	4.758	0.275
2189	12	350	350.62	445.90	436.50	0.0269	0.013	1.23	6.665	0.393	0.54	5.286	0.255
2190	12	360	360.17	459.90	446.00	0.0386	0.013	1.23	7.604	0.356	0.54	6.013	0.233
2191	8	350	359.77	355.00	353.50	0.0043	0.013	0.31	2.386	0.565	0.14	1.921	0.352
2192	8	400	400.51	353.40	351.60	0.0045	0.013	0.31	2.431	0.557	0.14	1.956	0.348
2193	8	400	399.43	351.50	349.70	0.0045	0.013	0.31	2.432	0.557	0.14	1.958	0.349
2194	8	400	397.17	349.60	348.00	0.0040	0.013	0.31	2.325	0.578	0.14	1.875	0.359
2195	8	400	430.54	303.00	300.50	0.0063	0.013	0.12	2.141	0.303	0.05	1.667	0.196
2196	12	300	299.75	312.90	310.10	0.0093	0.013	0.87	4.117	0.432	0.38	3.269	0.278
2197	12	350	350.35	316.60	313.00	0.0103	0.013	0.87	4.266	0.421	0.38	3.384	0.271
2198	12	400	400.00	320.80	316.70	0.0103	0.013	0.55	3.773	0.332	0.24	2.972	0.217
2199	12	400	400.39	325.00	320.90	0.0103	0.013	0.55	3.773	0.332	0.24	2.971	0.217
2200	8	300	300.35	330.00	325.10	0.0163	0.013	0.31	3.909	0.382	0.13	3.082	0.246
2201	8	300	300.00	335.00	330.10	0.0163	0.013	0.35	4.056	0.411	0.14	3.111	0.250
2202	12	400	349.99	310.00	309.00	0.0025	0.013	1.01	2.563	0.723	0.44	2.117	0.427
2203	12	400	350.12	308.90	307.90	0.0025	0.013	1.01	2.563	0.723	0.44	2.117	0.427
2204	12	400	350.37	307.80	306.80	0.0025	0.013	1.01	2.563	0.723	0.44	2.117	0.427
2205	12	400	350.14	306.70	305.70	0.0025	0.013	1.01	2.563	0.723	0.44	2.117	0.427
2206	8	400	400.52	309.70	306.65	0.0076	0.013	0.16	2.462	0.326	0.07	1.961	0.212
2207	8	400	399.65	314.40	309.80	0.0115	0.013	0.05	2.002	0.160	0.02	1.555	0.108
2208	8	400	400.35	319.00	314.50	0.0113	0.013	0.05	2.039	0.168	0.02	1.622	0.116
2209	15	400	399.81	305.40	304.60	0.0020	0.013	1.16	2.488	0.571	0.51	2.005	0.355
2210	15	400	400.17	304.50	303.70	0.0020	0.013	1.16	2.488	0.571	0.51	2.005	0.355
2211	15	400	401.04	303.60	302.80	0.0020	0.013	1.16	2.488	0.571	0.51	2.005	0.355
2212	15	400	400.17	302.70	301.90	0.0020	0.013	1.16	2.488	0.571	0.51	2.005	0.355
2213	15	325	370.66	301.80	301.00	0.0025	0.013	1.16	2.693	0.535	0.51	2.161	0.336

PIPEID	DIAMETER NOMINAL (IN)	LENGTH - 2D MH to MH (FT)	GIS LENGTH 3D (FT)	FROM_INV ELEV (FT)	TO_INV ELEV (FT)	SLOPE (FT/FT)	MANNINGS "N" VALUE	MAX DF (MGD)	MAX VELOCITY @ DF (FPS)	MAX D/d @ DF (FT/FT)	MAX AF (MGD)	MAX VELOCITY @ AF (FPS)	MAX D/d @ AF (FT/FT)
2214	8	400	400.30	305.35	302.15	0.0080	0.013	0.08	2.027	0.221	0.03	1.256	0.173
2215	8	400	400.70	308.65	305.45	0.0080	0.013	0.07	2.021	0.220	0.03	1.549	0.149
2216	8	400	400.01	311.95	308.75	0.0080	0.013	0.07	2.021	0.220	0.03	1.568	0.152
2217	15	375	400.17	300.90	300.10	0.0021	0.013	1.33	2.626	0.608	0.58	2.128	0.374
2218	15	400	400.17	300.00	299.20	0.0020	0.013	1.33	2.561	0.622	0.58	2.078	0.381
2219	15	400	400.21	299.10	298.30	0.0020	0.013	1.33	2.560	0.622	0.58	2.078	0.381
2220	15	400	400.10	298.20	296.20	0.0050	0.013	1.33	3.633	0.470	0.58	2.895	0.300
2221	15	400	400.47	296.10	294.10	0.0050	0.013	1.33	3.633	0.470	0.58	2.895	0.300
2222	15	400	400.04	300.30	299.70	0.0015	0.013	1.33	2.282	0.690	0.58	1.873	0.413
2223	15	320	400.12	292.10	287.40	0.0147	0.013	1.33	5.389	0.350	0.58	4.250	0.228
2224	15	320	250.30	287.30	282.60	0.0147	0.013	1.33	5.389	0.350	0.58	4.250	0.228
2225	15	300	249.95	282.50	278.10	0.0147	0.013	1.33	5.386	0.350	0.58	4.248	0.228
2226	15	400	400.37	278.00	277.20	0.0020	0.013	1.56	2.642	0.699	0.68	2.173	0.417
2227	15	370	400.29	277.10	276.30	0.0022	0.013	1.56	2.729	0.679	0.68	2.235	0.408
2231	15	310	300.56	276.20	275.50	0.0023	0.013	1.56	2.777	0.668	0.68	2.271	0.403
2232	15	320	300.29	275.40	274.70	0.0022	0.013	1.56	2.742	0.676	0.68	2.245	0.407
2233	15	320	320.42	274.60	271.70	0.0091	0.013	1.56	4.721	0.435	0.68	3.750	0.280
2234	15	325	350.77	271.60	268.00	0.0111	0.013	1.67	5.169	0.426	0.72	4.103	0.274
2235	30	175	150.24	266.90	265.00	0.0109	0.013	13.37	8.654	0.490	5.82	6.546	0.324
2236	30	325	336.74	264.00	259.00	0.0154	0.013	13.37	9.850	0.443	5.82	7.610	0.290
2237	30	30	20.84	258.00	256.20	0.0600	0.013	13.37	16.145	0.308	5.82	6.711	0.318
2240	12	400	400.30	332.90	324.40	0.0213	0.013	0.86	5.547	0.345	0.37	4.566	0.219
2241	12	400	374.94	344.00	333.00	0.0275	0.013	0.86	6.087	0.322	0.37	4.791	0.211
2242	12	400	399.41	346.00	344.10	0.0047	0.013	0.77	3.112	0.492	0.34	2.485	0.312
2243	12	400	399.65	348.00	346.10	0.0047	0.013	0.77	3.112	0.492	0.34	2.485	0.312
2244	12	400	399.76	350.00	348.10	0.0047	0.013	0.58	2.885	0.417	0.25	2.288	0.269
2245	12	400	399.85	352.00	350.10	0.0047	0.013	0.56	2.857	0.408	0.24	2.264	0.264
2246	12	400	399.79	354.00	352.10	0.0047	0.013	0.30	2.398	0.292	0.13	1.883	0.192
2247	15	400	399.91	345.10	344.00	0.0028	0.013	2.15	3.155	0.800	0.93	2.656	0.455
2248	15	400	399.44	347.80	345.20	0.0065	0.013	2.15	4.508	0.579	0.93	3.637	0.360
2249	15	325	322.43	350.00	347.90	0.0065	0.013	2.15	4.498	0.580	0.93	3.629	0.360
2250	8	400	400.42	359.00	351.35	0.0191	0.013	0.14	3.306	0.243	0.06	2.588	0.161
2251	8	400	400.27	368.10	359.10	0.0225	0.013	0.14	3.505	0.233	0.06	2.752	0.156
2252	8	300	299.52	375.00	368.20	0.0227	0.013	0.15	3.610	0.244	0.07	2.880	0.167
2253	15	375	349.96	351.00	350.10	0.0024	0.013	1.88	2.933	0.755	0.82	2.441	0.440
2254	15	375	376.06	352.90	351.10	0.0048	0.013	1.88	3.893	0.587	0.82	3.144	0.364
2255	15	375	375.05	354.90	353.00	0.0051	0.013	1.88	3.974	0.577	0.82	3.206	0.358
2256	15	375	375.30	356.80	355.00	0.0048	0.013	1.79	3.850	0.569	0.78	3.102	0.354
2257	15	375	375.15	358.00	356.90	0.0029	0.013	1.79	3.170	0.671	0.78	2.594	0.405
2258	10	400	399.67	369.50	358.10	0.0285	0.013	1.44	7.115	0.560	0.63	5.726	0.349
2259	10	400	400.16	385.00	369.60	0.0385	0.013	1.39	7.902	0.500	0.61	6.316	0.317
2260	10	300	300.42	389.07	385.10	0.0132	0.013	1.32	5.155	0.681	0.57	4.563	0.386
2261	10	350	350.21	391.20	389.17	0.0058	0.013	1.07	3.497	0.814	0.47	2.348	0.551
2262	10	350	349.86	405.00	391.30	0.0391	0.013	1.07	7.437	0.429	0.47	5.904	0.276

PIPEID	DIAMETER NOMINAL (IN)	LENGTH - 2D MH to MH (FT)	GIS LENGTH 3D (FT)	FROM_INV ELEV (FT)	TO_INV ELEV (FT)	SLOPE (FT/FT)	MANNINGS "N" VALUE	MAX DF (MGD)	MAX VELOCITY @ DF (FPS)	MAX D/d @ DF (FT/FT)	MAX AF (MGD)	MAX VELOCITY @ AF (FPS)	MAX D/d @ AF (FT/FT)
2263	10	350	349.83	411.20	405.10	0.0174	0.013	1.01	5.419	0.523	0.44	4.343	0.330
2264	10	300	299.56	415.00	411.30	0.0123	0.013	0.72	4.378	0.476	0.31	3.491	0.303
2265	8	350	350.39	422.00	415.10	0.0197	0.013	0.40	4.494	0.418	0.17	3.565	0.270
2266	8	350	349.88	427.30	422.10	0.0149	0.013	0.40	4.050	0.453	0.17	3.222	0.290
2267	8	350	350.15	435.00	427.40	0.0217	0.013	0.30	4.285	0.346	0.13	3.379	0.226
2268	8	350	349.67	438.00	435.10	0.0083	0.013	0.30	3.019	0.451	0.13	2.401	0.289
2269	8	300	300.50	445.00	438.10	0.0230	0.013	0.20	3.910	0.277	0.10	3.173	0.193
2270	12	350	350.28	417.50	415.61	0.0054	0.013	1.69	3.810	0.817	0.74	2.719	0.526
2271	12	350	350.26	420.00	417.60	0.0069	0.013	1.69	4.253	0.731	0.74	3.520	0.430
2272	12	350	349.99	422.50	420.10	0.0069	0.013	1.69	4.253	0.731	0.74	3.520	0.430
2273	12	350	350.00	425.00	422.60	0.0069	0.013	1.39	4.105	0.631	0.60	3.337	0.386
2274	12	400	400.00	435.00	425.10	0.0247	0.013	0.91	5.947	0.341	0.37	4.592	0.215
2275	8	400	400.16	478.70	460.90	0.0445	0.013	0.57	6.634	0.404	0.25	5.255	0.261
2276	8	400	399.87	512.70	478.80	0.0848	0.013	0.56	8.364	0.338	0.24	6.592	0.221
2277	8	400	399.73	540.70	512.80	0.0698	0.013	0.56	7.781	0.355	0.24	6.140	0.231
2278	8	400	400.10	554.20	540.80	0.0335	0.013	0.56	5.957	0.433	0.24	4.730	0.278
2279	8	340	340.06	561.30	554.30	0.0206	0.013	0.67	5.197	0.556	0.29	4.182	0.347
2280	8	400	400.26	466.20	460.90	0.0133	0.013	0.68	4.386	0.647	0.30	3.588	0.396
2281	8	400	400.06	472.50	466.30	0.0155	0.013	0.68	4.669	0.614	0.30	3.800	0.380
2282	8	400	400.08	478.70	472.60	0.0152	0.013	0.68	4.638	0.617	0.30	3.779	0.382
2283	8	400	400.33	485.00	478.80	0.0155	0.013	0.69	4.685	0.620	0.31	3.826	0.385
2284	8	350	350.13	503.80	485.10	0.0534	0.013	0.56	7.086	0.383	0.25	5.635	0.251
2285	8	350	349.90	523.20	503.90	0.0551	0.013	0.56	7.151	0.378	0.25	5.684	0.248
2286	8	350	349.88	542.60	523.30	0.0551	0.013	0.55	7.108	0.374	0.24	5.647	0.245
2287	8	350	349.90	562.00	542.70	0.0551	0.013	0.54	7.091	0.372	0.24	5.629	0.244
2288	8	350	349.93	581.40	562.10	0.0551	0.013	0.54	7.090	0.372	0.24	5.628	0.244
2289	8	350	349.91	600.80	581.50	0.0551	0.013	0.54	7.088	0.372	0.24	5.626	0.244
2290	8	400	400.25	622.90	600.90	0.0550	0.013	0.54	7.083	0.372	0.24	5.623	0.244
2291	8	400	400.21	645.00	623.00	0.0550	0.013	0.55	7.108	0.375	0.24	5.649	0.246
2292	8	250	274.90	366.00	362.10	0.0156	0.013	0.17	3.265	0.284	0.07	2.559	0.187
2293	8	250	250.40	370.00	366.10	0.0156	0.013	0.19	3.373	0.301	0.08	2.614	0.193
2294	8	325	324.47	363.24	362.10	0.0035	0.013	0.24	2.070	0.508	0.10	1.656	0.321
2295	8	325	324.80	364.48	363.34	0.0035	0.013	0.24	2.069	0.508	0.10	1.656	0.321
2296	8	250	249.98	365.46	364.58	0.0035	0.013	0.15	1.836	0.391	0.07	1.453	0.253
2297	8	250	249.63	366.44	365.56	0.0035	0.013	0.15	1.836	0.391	0.07	1.453	0.253
2298	8	400	399.73	372.00	366.54	0.0136	0.013	0.09	2.590	0.213	0.04	2.075	0.148
2299	10	300	300.05	371.30	369.20	0.0070	0.013	0.44	3.119	0.422	0.19	2.475	0.272
2300	10	300	300.45	375.80	371.40	0.0147	0.013	0.44	4.082	0.345	0.19	3.219	0.225
2301	10	350	349.91	381.00	375.90	0.0146	0.013	0.44	4.073	0.346	0.19	3.211	0.226
2302	10	350	350.22	382.20	381.10	0.0031	0.013	0.44	2.315	0.531	0.19	1.857	0.334
2303	10	350	349.83	383.28	382.30	0.0028	0.013	0.44	2.216	0.550	0.19	1.972	0.320
2304	10	300	300.18	384.64	383.38	0.0042	0.013	0.18	2.029	0.301	0.08	1.520	0.205
2305	10	300	299.95	386.00	384.74	0.0042	0.013	0.18	2.029	0.301	0.08	1.520	0.204
2308	8	325	325.06	371.30	368.86	0.0075	0.013	0.08	2.010	0.231	0.03	1.517	0.157

PIPEID	DIAMETER NOMINAL (IN)	LENGTH - 2D MH to MH (FT)	GIS LENGTH 3D (FT)	FROM_INV ELEV (FT)	TO_INV ELEV (FT)	SLOPE (FT/FT)	MANNINGS "N" VALUE	MAX DF (MGD)	MAX VELOCITY @ DF (FPS)	MAX D/d @ DF (FT/FT)	MAX AF (MGD)	MAX VELOCITY @ AF (FPS)	MAX D/d @ AF (FT/FT)
2309	12	325	325.02	368.00	367.30	0.0022	0.013	0.59	2.159	0.528	0.26	1.731	0.332
2310	12	400	400.64	367.20	366.32	0.0022	0.013	1.07	2.432	0.811	0.47	1.935	0.480
2311	10	300	299.43	369.80	368.30	0.0050	0.013	0.35	2.598	0.409	0.15	2.058	0.264
2312	10	250	250.01	371.20	369.90	0.0052	0.013	0.35	2.635	0.405	0.15	2.088	0.261
2313	12	350	345.87	369.60	368.10	0.0043	0.013	0.51	2.684	0.399	0.22	2.125	0.258
2314	12	350	353.09	371.40	369.70	0.0049	0.013	0.51	2.809	0.386	0.22	2.222	0.250
2315	12	350	350.03	373.20	371.50	0.0049	0.013	0.51	2.809	0.386	0.22	2.222	0.250
2316	12	350	344.42	375.00	373.30	0.0049	0.013	0.51	2.809	0.386	0.22	2.222	0.250
2317	12	400	521.33	380.00	375.10	0.0122	0.013	0.44	3.764	0.280	0.19	2.954	0.185
2318	8	400	400.19	385.00	381.00	0.0100	0.013	0.07	2.124	0.198	0.03	1.706	0.138
2319	10	300	300.28	382.20	381.00	0.0040	0.013	0.34	2.363	0.424	0.15	1.875	0.273
2320	10	300	300.40	383.50	382.30	0.0040	0.013	0.34	2.363	0.424	0.15	1.875	0.273
2321	10	350	349.89	385.00	383.60	0.0040	0.013	0.34	2.363	0.424	0.15	1.875	0.273
2322	12	350	350.42	369.00	367.00	0.0057	0.013	1.31	3.774	0.647	0.57	3.075	0.393
2323	12	350	350.02	371.00	369.10	0.0054	0.013	1.31	3.697	0.658	0.57	3.018	0.399
2324	12	350	350.02	372.60	371.10	0.0043	0.013	1.23	3.320	0.687	0.54	2.724	0.412
2325	12	350	350.03	374.20	372.70	0.0043	0.013	1.23	3.321	0.687	0.54	2.724	0.412
2326	12	400	400.03	376.00	374.30	0.0042	0.013	1.23	3.309	0.689	0.54	2.716	0.413
2327	10	400	399.88	393.00	376.10	0.0422	0.013	1.09	7.674	0.423	0.47	6.089	0.272
2328	10	400	400.09	410.00	393.10	0.0422	0.013	1.09	7.674	0.423	0.47	6.089	0.272
2329	10	400	399.80	413.90	410.10	0.0095	0.013	0.98	4.258	0.621	0.43	3.456	0.381
2330	10	400	400.10	423.00	414.00	0.0225	0.013	0.98	5.916	0.476	0.43	4.718	0.303
2331	10	400	399.49	436.90	423.10	0.0345	0.013	0.98	6.928	0.422	0.43	5.496	0.272
2332	10	400	400.02	450.00	437.00	0.0325	0.013	0.98	6.777	0.429	0.43	5.380	0.276
2333	8	400	400.46	452.48	450.80	0.0042	0.013	0.17	2.024	0.398	0.07	1.501	0.269
2334	8	400	400.27	454.26	452.58	0.0042	0.013	0.17	2.024	0.398	0.07	1.501	0.270
2335	8	400	400.00	458.36	454.36	0.0100	0.013	0.06	2.061	0.189	0.03	1.096	0.158
2336	8	350	349.82	467.70	450.80	0.0483	0.013	0.66	7.114	0.429	0.29	5.647	0.276
2337	8	350	349.93	478.50	467.80	0.0306	0.013	0.66	6.006	0.488	0.29	4.795	0.310
2338	8	400	400.06	485.00	478.60	0.0160	0.013	0.51	4.430	0.511	0.22	3.545	0.323
2339	8	400	400.33	515.00	485.10	0.0747	0.013	0.35	6.994	0.273	0.15	5.486	0.180
2340	8	350	350.23	527.00	515.10	0.0340	0.013	0.35	5.273	0.335	0.15	4.154	0.219
2341	8	350	350.48	539.10	527.10	0.0343	0.013	0.35	5.288	0.334	0.15	4.167	0.219
2342	8	350	349.96	551.20	539.20	0.0343	0.013	0.30	5.045	0.306	0.13	3.966	0.201
2343	8	400	399.88	565.00	551.30	0.0343	0.013	0.11	3.777	0.186	0.05	2.948	0.124
2344	8	400	400.23	578.30	565.10	0.0330	0.013	0.04	2.861	0.122	0.02	2.227	0.082
2345	8	350	349.88	590.00	578.40	0.0331	0.013	0.05	3.044	0.134	0.02	2.385	0.091
2346	8	400	400.01	625.00	614.60	0.0260	0.013	0.05	2.679	0.133	0.02	2.100	0.090
2347	8	400	400.45	614.50	604.10	0.0260	0.013	0.04	2.503	0.119	0.02	1.947	0.080
2348	8	350	350.30	604.00	595.10	0.0254	0.013	0.04	2.482	0.119	0.02	1.928	0.080
2349	8	400	400.15	595.00	585.20	0.0245	0.013	0.08	3.012	0.168	0.03	2.347	0.113
2350	8	400	399.93	585.10	575.50	0.0240	0.013	0.08	2.990	0.169	0.03	2.330	0.113
2351	8	400	400.21	575.40	562.90	0.0313	0.013	0.08	3.280	0.159	0.03	2.556	0.106
2352	8	300	337.88	562.80	558.10	0.0157	0.013	0.08	2.572	0.188	0.03	2.008	0.125

PIPEID	DIAMETER NOMINAL (IN)	LENGTH - 2D MH to MH (FT)	GIS LENGTH 3D (FT)	FROM_INV ELEV (FT)	TO_INV ELEV (FT)	SLOPE (FT/FT)	MANNINGS "N" VALUE	MAX DF (MGD)	MAX VELOCITY @ DF (FPS)	MAX D/d @ DF (FT/FT)	MAX AF (MGD)	MAX VELOCITY @ AF (FPS)	MAX D/d @ AF (FT/FT)
2353	8	400	400.11	558.00	555.10	0.0072	0.013	0.18	2.497	0.351	0.08	1.969	0.229
2354	8	400	400.07	555.00	553.10	0.0047	0.013	0.29	2.427	0.518	0.12	1.944	0.326
2355	8	400	400.49	354.80	352.60	0.0055	0.013	0.03	1.324	0.149	0.01	1.032	0.100
2356	8	400	400.23	357.10	354.90	0.0055	0.013	0.03	1.320	0.148	0.01	1.035	0.100
2357	8	300	300.38	358.85	357.20	0.0055	0.013	0.03	1.321	0.148	0.01	1.052	0.103
2358	8	10	69.52	553.00	552.80	0.0200	0.013	0.29	4.118	0.347	0.12	3.247	0.226
2359	30	10	29.50	255.20	254.10	0.1100	0.013	14.31	20.446	0.273	6.23	10.130	0.248
2360	24	400	431.15	350.00	346.10	0.0097	0.013	4.24	6.191	0.371	1.84	4.891	0.241
2367	12	400	400.58	366.22	365.34	0.0022	0.013	1.07	2.432	0.811	0.47	1.935	0.480
2368	12	400	400.43	365.24	364.36	0.0022	0.013	1.07	2.432	0.811	0.47	2.436	0.403
2369	12	400	399.90	364.26	362.60	0.0041	0.013	1.07	3.190	0.629	0.47	2.436	0.403
2370	15	400	399.70	362.50	361.70	0.0020	0.013	1.30	2.551	0.614	0.57	2.068	0.377
2371	15	400	397.94	361.60	360.80	0.0020	0.013	1.30	2.551	0.614	0.57	2.068	0.377
2372	15	400	398.65	360.70	359.70	0.0025	0.013	1.30	2.782	0.571	0.57	2.242	0.355
2373	8	400	398.80	280.00	278.40	0.0040	0.013	0.22	2.137	0.470	0.10	1.703	0.300
2374	8	400	399.71	278.30	276.70	0.0040	0.013	0.22	2.137	0.470	0.10	1.703	0.300
2375	8	400	398.42	276.60	275.00	0.0040	0.013	0.22	2.138	0.470	0.10	1.705	0.300
2376	10	350	351.43	274.80	273.50	0.0037	0.013	0.52	2.572	0.562	0.23	2.071	0.350
2377	10	350	350.30	273.40	272.00	0.0040	0.013	0.52	2.646	0.549	0.23	2.126	0.344
2378	10	350	352.77	263.40	262.30	0.0031	0.013	0.41	2.281	0.513	0.18	1.826	0.324
2379	10	350	351.64	264.50	263.50	0.0029	0.013	0.41	2.201	0.527	0.18	1.765	0.332
2380	10	300	299.73	265.50	264.60	0.0030	0.013	0.41	2.242	0.520	0.18	1.796	0.328
2381	10	300	299.99	266.50	265.60	0.0030	0.013	0.41	2.242	0.520	0.18	1.796	0.328
2382	12	300	297.73	262.10	261.40	0.0023	0.013	0.94	2.463	0.703	0.41	2.027	0.419
2383	12	350	349.87	261.30	260.50	0.0023	0.013	0.94	2.442	0.709	0.41	2.012	0.421
2384	12	300	300.36	260.40	259.70	0.0023	0.013	0.94	2.463	0.703	0.41	2.027	0.419
2385	12	350	339.39	259.60	258.70	0.0026	0.013	0.94	2.564	0.678	0.41	2.100	0.408

Table A-2

FPA MASTER PLAN UPDATE
Hydraulic Model
Table A-2: Manhole Details

MH ID (MOID)	DIAMETER (FT)	RIM ELEVATION (FT)	INVERT ELEVATION OUT (FT)	DEPTH (FT)	DF LOAD RESIDENTIAL (MGD)	DF LOAD COMMERCIAL (MGD)	DF LOAD OTHER (MGD)	DF LOAD TOTAL (MGD)
C1.0	5.0	265.00	255.20	9.8	0.0000	0.0000	0.0000	0.0000
C10.0	4.0	373.00	358.00	15.0	0.0000	0.0000	0.3505	0.3505
C10.01	4.0	384.50	369.50	15.0	0.0524	0.0000	0.0000	0.0524
C10.02	4.0	400.00	385.00	15.0	0.0745	0.0000	0.0000	0.0745
C11.0	4.0	405.00	389.07	15.9	0.0000	0.2429	0.0000	0.2429
C11.01	4.0	406.20	391.20	15.0	0.0000	0.0000	0.0000	0.0000
C11.02	4.0	420.00	405.00	15.0	0.0626	0.0000	0.0000	0.0626
C11.03	4.0	426.20	411.20	15.0	0.0000	0.2880	0.0000	0.2880
C12.0	4.0	430.00	415.00	15.0	0.2116	0.0000	0.1104	0.3220
C12.01	4.0	437.00	422.00	15.0	0.0000	0.0000	0.0000	0.0000
C12.02	4.0	442.30	427.30	15.0	0.1049	0.0000	0.0009	0.1058
C12.03	4.0	450.00	435.00	15.0	0.0000	0.0000	0.0000	0.0000
C12.04	4.0	453.00	438.00	15.0	0.0681	0.0000	0.0368	0.1049
C13.0	4.0	460.00	445.00	15.0	0.1730	0.0000	0.0184	0.1914
C14.0	4.0	386.60	371.90	14.7	0.0000	0.5612	0.0000	0.5612
C14.01	4.0	400.10	384.80	15.3	0.0000	0.0000	0.0000	0.0000
C14.02	4.0	409.10	393.90	15.2	0.0000	0.0000	0.0000	0.0000
C14.03	4.0	413.90	398.70	15.2	0.0000	0.0000	0.0000	0.0000
C14.04	4.0	416.80	402.30	14.5	0.0000	0.0000	0.0000	0.0000
C14.05	4.0	419.80	405.80	14.0	0.0000	0.0000	0.0000	0.0000
C14.06	4.0	423.70	409.20	14.5	0.0000	0.0000	0.0000	0.0000
C15.0	4.0	430.30	415.00	15.3	0.0000	0.0000	0.0000	0.0000
C15.01	4.0	430.20	417.50	12.7	0.0000	0.0000	0.0000	0.0000
C15.02	4.0	433.00	420.00	13.0	0.0000	0.0000	0.0000	0.0000
C15.03	4.0	435.70	422.50	13.2	0.3045	0.0000	0.0000	0.3045
C15.04	4.0	435.80	424.00	11.8	0.0000	0.0000	0.0000	0.0000
C15.05	4.0	441.30	429.30	12.0	0.0000	0.0000	0.0000	0.0000
C15.06	4.0	448.60	436.40	12.2	0.0000	0.0000	0.0000	0.0000
C15.07	4.0	458.00	445.90	12.1	0.0000	0.0000	0.0000	0.0000
C15.1	4.0	440.00	425.00	15.0	0.0000	0.6265	0.0000	0.6265
C15.2	4.0	450.00	435.00	15.0	0.2806	0.2613	0.2180	0.7599
C16.0	4.0	473.10	459.90	13.2	0.0000	0.0000	0.0000	0.0000
C16.01	4.0	479.80	466.20	13.6	0.0000	0.0000	0.0000	0.0000
C16.02	4.0	486.50	472.50	14.0	0.0000	0.0000	0.0000	0.0000
C16.03	4.0	493.20	478.70	14.5	0.0000	0.0000	0.0000	0.0000
C16.04	4.0	493.70	478.70	15.0	0.0000	0.0000	0.0000	0.0000
C16.05	4.0	527.70	512.70	15.0	0.0000	0.0000	0.0000	0.0000
C16.06	4.0	555.70	540.70	15.0	0.0000	0.0000	0.0000	0.0000
C16.07	4.0	569.20	554.20	15.0	0.0000	0.0000	0.0000	0.0000
C17.0	4.0	500.00	485.00	15.0	0.1279	0.0000	0.0000	0.1279
C17.01	4.0	519.30	503.80	15.5	0.0000	0.0000	0.0000	0.0000
C17.02	4.0	538.60	523.20	15.4	0.0064	0.0000	0.0000	0.0064
C17.03	4.0	557.90	542.60	15.3	0.0000	0.0000	0.0000	0.0000
C17.04	4.0	577.20	562.00	15.2	0.0000	0.0000	0.0000	0.0000
C17.05	4.0	596.50	581.40	15.1	0.0000	0.0000	0.0000	0.0000
C17.06	4.0	615.80	600.80	15.0	0.0000	0.0000	0.0000	0.0000
C17.07	4.0	637.90	622.90	15.0	0.0000	0.0000	0.0000	0.0000

MH ID (MOID)	DIAMETER (FT)	RIM ELEVATION (FT)	INVERT ELEVATION OUT (FT)	DEPTH (FT)	DF LOAD RESIDENTIAL (MGD)	DF LOAD COMMERCIAL (MGD)	DF LOAD OTHER (MGD)	DF LOAD TOTAL (MGD)
C18.0	4.0	660.00	622.90	37.1	0.2512	0.0000	0.0000	0.2512
C19.0	4.0	568.00	553.00	15.0	0.0000	0.0000	0.0000	0.0000
C2.0	5.0	265.00	258.00	7.0	0.0000	0.0000	0.0000	0.0000
C2.01	5.0	282.00	264.00	18.0	0.0000	0.0000	0.0000	0.0000
C2.02	4.0	270.00	260.40	9.6	0.0000	0.0000	0.0000	0.0000
C2.03	4.0	274.00	261.30	12.7	0.0000	0.0000	0.0000	0.0000
C2.04	4.0	265.00	259.60	5.4	0.0000	0.0000	0.0000	0.0000
C2.1	4.0	278.00	262.10	15.9	0.0000	0.0000	0.0000	0.0000
C2.11	4.0	280.00	273.40	6.6	0.0000	0.0000	0.0000	0.0000
C2.12	4.0	275.00	263.40	11.6	0.0000	0.0000	0.0000	0.0000
C2.13	4.0	272.00	264.50	7.5	0.0000	0.0000	0.0000	0.0000
C2.14	4.0	272.00	265.50	6.5	0.0000	0.0000	0.0000	0.0000
C2.2	4.0	282.00	274.80	7.2	0.0000	0.0000	0.3018	0.3018
C2.21	4.0	285.00	276.60	8.4	0.0000	0.0000	0.0000	0.0000
C2.22	4.0	288.00	278.30	9.7	0.0000	0.0000	0.0000	0.0000
C2.3	4.0	289.00	280.00	9.0	0.0000	0.0000	0.2226	0.2226
C2.4	4.0	272.00	266.50	5.5	0.0000	0.0000	0.4149	0.4149
C20.0	4.0	570.00	555.00	15.0	0.1095	0.0000	0.0000	0.1095
C21.0	4.0	570.00	558.00	12.0	0.1012	0.0000	0.0000	0.1012
C21.01	4.0	575.80	562.80	13.0	0.0000	0.0000	0.0000	0.0000
C21.02	4.0	589.40	575.40	14.0	0.0000	0.0000	0.0000	0.0000
C21.03	4.0	600.10	585.10	15.0	0.0000	0.0000	0.0000	0.0000
C22.0	4.0	610.00	595.00	15.0	0.0377	0.0000	0.0000	0.0377
C22.01	4.0	619.00	604.00	15.0	0.0000	0.0000	0.0000	0.0000
C22.02	4.0	629.50	614.50	15.0	0.0000	0.0000	0.0000	0.0000
C23.0	4.0	640.00	625.00	15.0	0.0000	0.0000	0.0377	0.0377
C24.0	4.0	576.30	561.30	15.0	0.0377	0.5198	0.0000	0.5575
C3.0	5.0	282.50	266.90	15.6	0.0000	0.0000	0.0000	0.0000
C3.01	5.0	278.50	269.80	8.7	0.0000	0.0000	0.0000	0.0000
C3.02	5.0	284.00	272.50	11.5	0.0000	0.0000	0.0000	0.0000
C4.0	5.0	296.00	281.50	14.5	0.0000	0.0000	0.0000	0.0000
C4.02	5.0	306.00	291.50	14.5	0.0000	0.0000	0.0000	0.0000
C5.0	5.0	309.70	296.90	12.8	0.0000	0.0000	0.0000	0.0000
C5.01	4.0	312.40	300.97	11.4	0.0000	0.0000	0.0000	0.0000
C5.02	4.0	316.40	305.23	11.2	0.0000	0.0000	0.0000	0.0000
C5.03	4.0	320.40	309.49	10.9	0.0000	0.0000	0.0000	0.0000
C5.04	4.0	326.30	313.75	12.6	0.0000	0.0000	0.0000	0.0000
C5.05	4.0	335.50	318.11	17.4	0.0000	0.0000	0.0000	0.0000
C6.0	4.0	338.80	322.48	16.3	0.0331	0.0000	0.0000	0.0331
C6.01	4.0	346.90	332.90	14.0	0.0000	0.0000	0.0000	0.0000
C6.02	4.0	340.70	325.50	15.2	0.0000	0.0000	0.0000	0.0000
C6.03	4.0	342.50	328.52	14.0	0.0000	0.0000	0.0000	0.0000
C6.04	4.0	346.20	331.63	14.6	0.0000	0.0000	0.0322	0.0322
C6.05	4.0	351.00	334.46	16.5	0.0000	0.0000	0.0589	0.0589
C6.06	4.0	355.90	337.25	18.7	0.0000	0.0000	0.0000	0.0000
C6.07	4.0	360.70	340.05	20.7	0.1233	0.0000	0.0000	0.1233
C6.1	4.0	362.00	344.00	18.0	0.0883	0.0000	0.0000	0.0883

MH ID (MOID)	DIAMETER (FT)	RIM ELEVATION (FT)	INVERT ELEVATION OUT (FT)	DEPTH (FT)	DF LOAD RESIDENTIAL (MGD)	DF LOAD COMMERCIAL (MGD)	DF LOAD OTHER (MGD)	DF LOAD TOTAL (MGD)
C6.11	4.0	363.00	346.00	17.0	0.0000	0.0000	0.0000	0.0000
C6.12	4.0	364.00	348.00	16.0	0.0000	0.0000	0.1950	0.1950
C6.13	4.0	365.00	350.00	15.0	0.0000	0.0000	0.0212	0.0212
C6.14	4.0	366.00	352.00	14.0	0.0000	0.2604	0.0000	0.2604
C6.2	4.0	367.00	354.00	13.0	0.0000	0.0000	0.2962	0.2962
C7.0	4.0	363.00	342.70	20.3	0.1619	0.0000	0.0000	0.1619
C7.01	4.0	363.70	345.10	18.6	0.0000	0.0000	0.0000	0.0000
C7.02	4.0	364.40	347.80	16.6	0.0000	0.0000	0.0000	0.0000
C7.03	4.0	365.00	346.40	18.6	0.0000	0.0000	0.0000	0.0000
C7.04	4.0	367.00	349.90	17.1	0.0000	0.0000	0.0000	0.0000
C7.05	4.0	373.10	358.90	14.2	0.0000	0.0000	0.0000	0.0000
C8.0	4.0	365.00	350.00	15.0	0.1242	0.0000	0.0000	0.1242
C8.01	4.0	374.00	359.00	15.0	0.0000	0.0000	0.0000	0.0000
C8.02	4.0	383.10	368.10	15.0	0.0000	0.0000	0.0000	0.0000
C8.03	4.0	366.00	351.00	15.0	0.0000	0.0000	0.0000	0.0000
C8.04	4.0	367.90	352.90	15.0	0.0000	0.0000	0.0000	0.0000
C8.05	4.0	369.90	354.90	15.0	0.0892	0.0000	0.0000	0.0892
C8.06	4.0	371.80	356.80	15.0	0.0000	0.0000	0.0000	0.0000
C9.0	4.0	390.00	375.00	15.0	0.1380	0.0000	0.0000	0.1380
H1.0	4.0	289.50	271.60	17.9	0.1030	0.0000	0.0000	0.1030
H1.01	4.0	295.20	274.60	20.6	0.0000	0.0000	0.0000	0.0000
H1.02	4.0	296.80	275.40	21.4	0.0000	0.0000	0.0000	0.0000
H2.0	4.0	294.90	276.20	18.7	0.0000	0.0000	0.0000	0.0000
H2.03	4.0	292.80	277.10	15.7	0.0000	0.0000	0.0000	0.0000
H3.0	4.0	291.90	278.00	13.9	0.0000	0.0000	0.2328	0.2328
H3.01	4.0	297.90	282.50	15.4	0.0000	0.0000	0.0000	0.0000
H3.02	4.0	302.70	287.30	15.4	0.0000	0.0000	0.0000	0.0000
H3.03	4.0	306.80	292.10	14.7	0.0000	0.0000	0.0000	0.0000
H3.04	4.0	308.50	294.10	14.4	0.0000	0.0000	0.0000	0.0000
H3.05	4.0	310.50	296.10	14.4	0.0000	0.0000	0.0000	0.0000
H3.06	4.0	312.50	298.20	14.3	0.0046	0.0000	0.0000	0.0046
H3.07	4.0	314.50	299.10	15.4	0.0000	0.0000	0.0000	0.0000
H3.08	4.0	316.50	300.00	16.5	0.0000	0.0000	0.0000	0.0000
H4.0	4.0	318.30	300.90	17.4	0.0883	0.0000	0.0000	0.0883
H4.01	4.0	320.60	305.35	15.3	0.0000	0.0000	0.0000	0.0000
H4.02	4.0	322.80	308.65	14.2	0.0000	0.0000	0.0000	0.0000
H4.03	4.0	320.00	301.80	18.2	0.0000	0.0000	0.0000	0.0000
H4.04	4.0	322.00	302.70	19.3	0.0000	0.0000	0.0000	0.0000
H4.05	4.0	324.00	303.60	20.4	0.0000	0.0000	0.0000	0.0000
H4.06	4.0	326.00	304.50	21.5	0.0000	0.0000	0.0000	0.0000
H4.1	4.0	325.00	311.95	13.1	0.0745	0.0000	0.0000	0.0745
H5.0	4.0	328.00	305.40	22.6	0.0000	0.0000	0.0000	0.0000
H5.01	4.0	323.40	309.70	13.7	0.1113	0.0000	0.0000	0.1113
H5.02	4.0	331.90	314.40	17.5	0.0000	0.0000	0.0000	0.0000
H5.03	4.0	326.00	306.70	19.3	0.0000	0.0000	0.0000	0.0000
H5.04	4.0	324.00	307.80	16.2	0.0000	0.0000	0.0000	0.0000
H5.05	4.0	322.00	308.90	13.1	0.0000	0.0000	0.0000	0.0000

Table A-2: Manhole Details

MH ID (MOID)	DIAMETER (FT)	RIM ELEVATION (FT)	INVERT ELEVATION OUT (FT)	DEPTH (FT)	DF LOAD RESIDENTIAL (MGD)	DF LOAD COMMERCIAL (MGD)	DF LOAD OTHER (MGD)	DF LOAD TOTAL (MGD)
H5.1	4.0	334.00	319.00	15.0	0.0276	0.0000	0.0184	0.0460
H6.0	4.0	320.90	310.00	10.9	0.0000	0.1408	0.0000	0.1408
H6.01	4.0	324.20	312.90	11.3	0.0000	0.0000	0.0000	0.0000
H6.02	4.0	329.00	316.60	12.4	0.0874	0.2236	0.0000	0.3110
H6.03	4.0	334.50	320.80	13.7	0.0000	0.0000	0.0000	0.0000
H7.0	4.0	340.00	325.00	15.0	0.2512	0.0000	0.0000	0.2512
H7.01	4.0	342.50	330.00	12.5	0.0000	0.0000	0.0000	0.0000
H8.0	4.0	345.00	335.00	10.0	0.3036	0.0000	0.0000	0.3036
M0.01	5.0	310.40	297.42	13.0	0.0000	0.0000	0.0000	0.0000
M0.02	5.0	312.40	297.95	14.4	0.0000	0.0000	0.0000	0.0000
M0.03	5.0	314.40	298.49	15.9	0.0000	0.0000	0.0000	0.0000
M1.0	5.0	317.70	299.00	18.7	0.0000	0.0000	0.0000	0.0000
M1.01	5.0	327.80	311.00	16.8	0.0000	0.0000	0.0000	0.0000
M1.02	5.0	342.40	323.00	19.4	0.0000	0.0000	0.0000	0.0000
M1.03	5.0	353.00	335.00	18.0	0.0000	0.0000	0.0000	0.0000
M1.04	5.0	357.70	340.60	17.1	0.0000	0.0000	0.0000	0.0000
M1.05	5.0	359.70	343.30	16.4	0.0000	0.0000	0.0000	0.0000
M1.1	4.0	312.00	303.00	9.0	0.1196	0.0000	0.0000	0.1196
M10.0	4.0	380.50	367.20	13.3	0.1334	0.0000	0.0000	0.1334
M10.01	4.0	382.30	369.80	12.5	0.0000	0.0000	0.0000	0.0000
M10.1	4.0	383.00	371.20	11.8	0.1674	0.1849	0.0000	0.3524
M10.2	4.0	381.50	366.22	15.3	0.0000	0.0000	0.0000	0.0000
M11.0	4.0	391.00	376.00	15.0	0.1463	0.0000	0.0000	0.1463
M11.01	4.0	408.00	393.00	15.0	0.0000	0.0000	0.0000	0.0000
M11.02	4.0	425.00	410.00	15.0	0.1086	0.0000	0.0000	0.1086
M11.03	4.0	428.90	413.90	15.0	0.0000	0.0000	0.0000	0.0000
M11.04	4.0	438.00	423.00	15.0	0.0000	0.0000	0.0000	0.0000
M11.05	4.0	451.90	436.90	15.0	0.0000	0.0000	0.0000	0.0000
M12.0	4.0	465.00	450.00	15.0	0.1536	0.0000	0.0000	0.1536
M12.01	4.0	467.20	452.48	14.7	0.0000	0.0000	0.0000	0.0000
M12.02	4.0	482.70	467.70	15.0	0.0000	0.0000	0.0000	0.0000
M12.03	4.0	493.50	478.50	15.0	0.1435	0.0000	0.0000	0.1435
M12.1	4.0	468.70	454.26	14.4	0.1113	0.0000	0.0000	0.1113
M12.2	4.0	470.20	458.36	11.8	0.0580	0.0000	0.0000	0.0580
M13.0	4.0	500.00	485.00	15.0	0.0736	0.0000	0.0902	0.1638
M14.0	4.0	530.00	515.00	15.0	0.0000	0.0000	0.0000	0.0000
M14.01	4.0	542.00	527.00	15.0	0.0000	0.0000	0.0000	0.0000
M14.02	4.0	554.10	539.10	15.0	0.0543	0.0000	0.0000	0.0543
M14.03	4.0	566.20	551.20	15.0	0.1868	0.0000	0.0000	0.1868
M15.0	4.0	580.00	565.00	15.0	0.0653	0.0000	0.0000	0.0653
M15.01	4.0	593.30	578.30	15.0	0.0000	0.0000	0.0000	0.0000
M16.0	4.0	605.00	590.00	15.0	0.0432	0.0000	0.0000	0.0432
M2.0	5.0	361.70	346.00	15.7	0.1343	0.0000	0.0000	0.1343
M2.01	4.0	362.80	349.60	13.2	0.0000	0.0000	0.0000	0.0000
M2.02	4.0	364.20	351.50	12.7	0.0000	0.0000	0.0000	0.0000
M2.03	4.0	365.60	353.40	12.2	0.0000	0.0000	0.0000	0.0000
M2.04	5.0	364.70	350.00	14.7	0.0000	0.0000	0.0000	0.0000

MH ID (MOID)	DIAMETER (FT)	RIM ELEVATION (FT)	INVERT ELEVATION OUT (FT)	DEPTH (FT)	DF LOAD RESIDENTIAL (MGD)	DF LOAD COMMERCIAL (MGD)	DF LOAD OTHER (MGD)	DF LOAD TOTAL (MGD)
M2.05	5.0	369.30	351.00	18.3	0.0120	0.0000	0.0000	0.0120
M2.06	5.0	373.80	351.50	22.3	0.0000	0.0000	0.0368	0.0368
M2.07	5.0	374.30	352.00	22.3	0.0000	0.0000	0.0000	0.0000
M2.1	4.0	370.00	355.00	15.0	0.3137	0.0000	0.0000	0.3137
M3.0	5.0	372.30	352.50	19.8	0.2162	0.0000	0.0009	0.2171
M3.01	4.0	372.70	354.80	17.9	0.0000	0.0000	0.0000	0.0000
M3.02	4.0	370.70	357.10	13.6	0.0000	0.0000	0.0000	0.0000
M3.03	5.0	374.30	353.00	21.3	0.0000	0.0000	0.0000	0.0000
M3.04	5.0	374.70	353.50	21.2	0.0000	0.0000	0.0000	0.0000
M3.05	5.0	372.10	354.00	18.1	0.0000	0.0000	0.0000	0.0000
M3.06	5.0	369.50	354.50	15.0	0.0000	0.0000	0.0000	0.0000
M3.1	4.0	368.00	358.85	9.2	0.0000	0.0000	0.0276	0.0276
M4.0	5.0	366.90	355.00	11.9	0.4333	0.0000	0.0000	0.4333
M4.01	5.0	364.30	355.50	8.8	0.0000	0.0000	0.0000	0.0000
M5.0	5.0	364.00	356.00	8.0	0.0000	0.0000	0.0000	0.0000
M5.01	5.0	366.00	358.10	7.9	0.0000	0.0000	0.0000	0.0000
M6.0	5.0	367.50	358.50	9.0	0.0000	0.0000	0.0000	0.0000
M6.01	5.0	369.50	359.00	10.5	0.0000	0.0000	0.0000	0.0000
M6.02	5.0	371.50	360.00	11.5	0.0000	0.0000	0.0000	0.0000
M6.1	4.0	371.00	360.70	10.3	0.0000	0.0000	0.0000	0.0000
M6.11	4.0	373.00	361.60	11.4	0.0000	0.0000	0.0000	0.0000
M6.2	4.0	375.00	362.50	12.5	0.0000	0.0000	0.2300	0.2300
M6.21	4.0	377.50	364.26	13.2	0.0000	0.0000	0.0000	0.0000
M6.3	4.0	380.00	365.24	14.8	0.0000	0.0000	0.0000	0.0000
M7.0	5.0	373.50	360.60	12.9	0.0000	0.0000	0.0000	0.0000
M7.01	4.0	371.10	363.24	7.9	0.0000	0.0000	0.0000	0.0000
M7.02	4.0	378.50	366.00	12.5	0.0000	0.0000	0.0000	0.0000
M7.03	4.0	375.50	361.20	14.3	0.0000	0.0000	0.0000	0.0000
M7.04	4.0	377.50	361.80	15.7	0.0000	0.0000	0.0000	0.0000
M7.05	4.0	379.50	364.10	15.4	0.0000	0.0000	0.0000	0.0000
M7.06	4.0	381.50	366.40	15.1	0.0000	0.0000	0.0000	0.0000
M7.1	4.0	372.00	364.48	7.5	0.0883	0.0000	0.0000	0.0883
M7.11	4.0	373.00	365.46	7.5	0.0000	0.0000	0.0000	0.0000
M7.2	4.0	374.00	366.44	7.6	0.0653	0.0000	0.0000	0.0653
M7.3	4.0	380.00	372.00	8.0	0.0846	0.0000	0.0000	0.0846
M7.4	4.0	385.00	370.00	15.0	0.1316	0.0000	0.0377	0.1693
M8.0	4.0	383.60	367.00	16.6	0.0497	0.0000	0.0000	0.0497
M8.01	4.0	386.20	371.30	14.9	0.0000	0.0000	0.0000	0.0000
M8.02	4.0	388.40	375.80	12.6	0.0000	0.0000	0.0000	0.0000
M8.04	4.0	384.00	369.00	15.0	0.0000	0.0000	0.0000	0.0000
M8.05	4.0	386.00	371.00	15.0	0.0754	0.0000	0.0000	0.0754
M8.06	4.0	387.60	372.60	15.0	0.0000	0.0000	0.0000	0.0000
M8.07	4.0	389.20	374.20	15.0	0.0000	0.0000	0.0000	0.0000
M8.1	4.0	391.00	381.00	10.0	0.0000	0.0000	0.0000	0.0000
M8.11	4.0	392.30	382.20	10.1	0.0000	0.0000	0.0000	0.0000
M8.12	4.0	393.60	383.28	10.3	0.0000	0.2594	0.0000	0.2594
M8.13	4.0	394.80	384.64	10.2	0.0000	0.0000	0.0000	0.0000

Table A-2: Manhole Details

MH ID (MOID)	DIAMETER (FT)	RIM ELEVATION (FT)	INVERT ELEVATION OUT (FT)	DEPTH (FT)	DF LOAD RESIDENTIAL (MGD)	DF LOAD COMMERCIAL (MGD)	DF LOAD OTHER (MGD)	DF LOAD TOTAL (MGD)
M8.2	4.0	396.00	386.00	10.0	0.1812	0.0000	0.0000	0.1812
M9.0	4.0	382.20	371.30	10.9	0.0791	0.0000	0.0000	0.0791
M9.01	4.0	381.00	369.60	11.4	0.0000	0.0000	0.0000	0.0000
M9.02	4.0	384.00	371.40	12.6	0.0000	0.0000	0.0000	0.0000
M9.03	4.0	387.00	373.20	13.8	0.0000	0.0000	0.0000	0.0000
M9.04	4.0	390.00	375.00	15.0	0.0690	0.0000	0.0000	0.0690
M9.05	4.0	378.00	368.00	10.0	0.0000	0.0000	0.0000	0.0000
M9.1	4.0	395.00	380.00	15.0	0.0000	0.0000	0.0377	0.0377
M9.11	4.0	396.60	382.20	14.4	0.0000	0.0000	0.0000	0.0000
M9.12	4.0	398.20	383.50	14.7	0.0000	0.0000	0.0000	0.0000
M9.2	4.0	400.00	385.00	15.0	0.3358	0.0000	0.0000	0.3358
M9.3	4.0	395.00	385.00	10.0	0.0653	0.0000	0.0000	0.0653

Table A-3

FPA MASTER PLAN UPDATE
Hydraulic Model
Table A-3: Land Use and Load Details

LAND USE	AREA (ACRES)	ESDs	PEAKING FACTOR	FLOW / ESD (GPD)	DF - I&I (MGD)	AF (MGD)	ASSIGNED MH
MU	14.1	239	2.3	400	0.220	0.096	C10.0
MU	7.9	141	2.3	400	0.130	0.056	C10.0
P	1.2	1	2.3	400	0.001	0.000	C10.0
MLD	6.4	57	2.3	400	0.052	0.023	C10.01
MLD	8.9	81	2.3	400	0.075	0.032	C10.02
GC	12.6	264	2.3	400	0.243	0.106	C11.0
MLD	7.6	68	2.3	400	0.063	0.027	C11.02
GC	15.8	313	2.3	400	0.288	0.125	C11.03
MLD	13.9	126	2.3	400	0.116	0.050	C12.0
MLD	11.5	104	2.3	400	0.096	0.042	C12.0
MU	6.5	120	2.3	400	0.110	0.048	C12.0
MHD	5.7	114	2.3	400	0.105	0.046	C12.02
P	5.0	1	2.3	400	0.001	0.000	C12.02
MLD	8.3	74	2.3	400	0.068	0.030	C12.04
PQP	10.0	40	2.3	400	0.037	0.016	C12.04
P	26.1	20	2.3	400	0.018	0.008	C13.0
SFHD	26.0	144	2.3	400	0.132	0.058	C13.0
SFHD	8.0	44	2.3	400	0.040	0.018	C13.0
RC	110.8	610	2.3	400	0.561	0.244	C14.0
MHD	18.4	331	2.3	400	0.305	0.132	C15.03
GC	57.9	550	2.3	400	0.506	0.220	C15.1
GC	4.7	131	2.3	400	0.121	0.052	C15.1
GC	13.7	284	2.3	400	0.261	0.114	C15.2
IND_OP	10.5	237	2.3	400	0.218	0.095	C15.2
MMD	22.2	305	2.3	400	0.281	0.122	C15.2
MLD	15.2	139	2.3	400	0.128	0.056	C17.0
MLD	0.7	7	2.3	400	0.006	0.003	C17.02
SF	89.3	273	2.3	400	0.251	0.109	C18.0
IND_OP	16.6	328	2.3	400	0.302	0.131	C2.2
IND_OP	11.0	242	2.3	400	0.223	0.097	C2.3
IND_OP	30.1	451	2.3	400	0.415	0.180	C2.4
SF	39.2	119	2.3	400	0.109	0.048	C20.0
SF	38.3	110	2.3	400	0.101	0.044	C21.0
SF	7.3	21	2.3	400	0.019	0.008	C22.0
SF	7.1	20	2.3	400	0.018	0.008	C22.0
P	6.5	1	2.3	400	0.001	0.000	C23.0
PQP	10.0	40	2.3	400	0.037	0.016	C23.0
GC	59.5	565	2.3	400	0.520	0.226	C24.0
SF	10.4	31	2.3	400	0.029	0.012	C24.0
SF	3.6	10	2.3	400	0.009	0.004	C24.0

Table A-3: Land Use and Load Details

LAND USE	AREA (ACRES)	ESDs	PEAKING FACTOR	FLOW / ESD (GPD)	DF - I&I (MGD)	AF (MGD)	ASSIGNED MH
SF	10.2	36	2.3	400	0.033	0.014	C6.0
MU	1.8	35	2.3	400	0.032	0.014	C6.04
MU	4.0	64	2.3	400	0.059	0.026	C6.05
SFHD	24.4	134	2.3	400	0.123	0.054	C6.07
MLD	10.6	96	2.3	400	0.088	0.038	C6.1
IND_OP	9.2	212	2.3	400	0.195	0.085	C6.12
MU	1.1	22	2.3	400	0.020	0.009	C6.13
P	2.3	1	2.3	400	0.001	0.000	C6.13
GC	13.7	283	2.3	400	0.260	0.113	C6.14
MU	10.5	180	2.3	400	0.166	0.072	C6.2
MU	7.9	142	2.3	400	0.131	0.057	C6.2
MMD	12.8	176	2.3	400	0.162	0.070	C7.0
SFHD	19.3	107	2.3	400	0.098	0.043	C8.0
SFHD	5.1	28	2.3	400	0.026	0.011	C8.0
MLD	10.8	97	2.3	400	0.089	0.039	C8.05
SF	30.3	91	2.3	400	0.084	0.036	C9.0
SFHD	10.7	59	2.3	400	0.054	0.024	C9.0
SF	35.5	112	2.3	400	0.103	0.045	H1.0
IND_OP	11.8	253	2.3	400	0.233	0.101	H3.0
SF	1.4	5	2.3	400	0.005	0.002	H3.06
SF	31.7	96	2.3	400	0.088	0.038	H4.0
SF	23.2	81	2.3	400	0.075	0.032	H4.1
MMD	8.6	121	2.3	400	0.111	0.048	H5.01
P	47.9	20	2.3	400	0.018	0.008	H5.1
SFHD	3.6	30	2.3	400	0.028	0.012	H5.1
CC	6.3	153	2.3	400	0.141	0.061	H6.0
CC	11.1	243	2.3	400	0.224	0.097	H6.02
MLD	9.0	95	2.3	400	0.087	0.038	H6.02
MHD	9.8	185	2.3	400	0.170	0.074	H7.0
SFHD	14.4	88	2.3	400	0.081	0.035	H7.0
SFHD	38.0	289	2.3	400	0.266	0.116	H8.0
SFHD	6.2	41	2.3	400	0.038	0.016	H8.0
SF	41.6	130	2.3	400	0.120	0.052	M1.1
MMD	11.3	145	2.3	400	0.133	0.058	M10.0
CC	7.8	181	2.3	400	0.167	0.072	M10.1
CC	0.7	20	2.3	400	0.018	0.008	M10.1
MHD	9.1	182	2.3	400	0.167	0.073	M10.1
SFHD	28.6	159	2.3	400	0.146	0.064	M11.0
SFHD	22.0	118	2.3	400	0.109	0.047	M11.02
SFHD	29.3	167	2.3	400	0.154	0.067	M12.0

Table A-3: Land Use and Load Details

LAND USE	AREA (ACRES)	ESDs	PEAKING FACTOR	FLOW / ESD (GPD)	DF - I&I (MGD)	AF (MGD)	ASSIGNED MH
MLD	17.3	156	2.3	400	0.144	0.062	M12.03
MLD	8.2	74	2.3	400	0.068	0.030	M12.1
MLD	5.3	47	2.3	400	0.043	0.019	M12.1
MLD	7.0	63	2.3	400	0.058	0.025	M12.2
MLD	7.1	80	2.3	400	0.074	0.032	M13.0
MU	5.3	98	2.3	400	0.090	0.039	M13.0
SF	21.4	59	2.3	400	0.054	0.024	M14.02
SF	11.2	18	2.3	400	0.017	0.007	M14.03
SFHD	33.4	185	2.3	400	0.170	0.074	M14.03
SF	17.5	71	2.3	400	0.065	0.028	M15.0
SF	9.9	27	2.3	400	0.025	0.011	M16.0
SF	5.5	20	2.3	400	0.018	0.008	M16.0
SF	28.0	98	2.3	400	0.090	0.039	M2.0
SF	13.7	48	2.3	400	0.044	0.019	M2.0
SF	3.7	13	2.3	400	0.012	0.005	M2.05
PQP	10.0	40	2.3	400	0.037	0.016	M2.06
MLD	13.1	119	2.3	400	0.109	0.048	M2.1
SF	16.2	57	2.3	400	0.052	0.023	M2.1
SF	4.9	15	2.3	400	0.014	0.006	M2.1
SF	4.3	13	2.3	400	0.012	0.005	M2.1
SFHD	20.9	137	2.3	400	0.126	0.055	M2.1
P	10.0	1	2.3	400	0.001	0.000	M3.0
SF	28.9	101	2.3	400	0.093	0.040	M3.0
SF	11.1	39	2.3	400	0.036	0.016	M3.0
SFHD	20.5	95	2.3	400	0.087	0.038	M3.0
PQP	48.7	30	2.3	400	0.028	0.012	M3.1
MLD	24.7	222	2.3	400	0.204	0.089	M4.0
SFHD	44.8	249	2.3	400	0.229	0.100	M4.0
PQP	79.6	250	2.3	400	0.230	0.100	M6.2
MLD	10.7	96	2.3	400	0.088	0.038	M7.1
MLD	7.9	71	2.3	400	0.065	0.028	M7.2
MMD	7.2	92	2.3	400	0.085	0.037	M7.3
P	10.6	1	2.3	400	0.001	0.000	M7.4
PQP	11.0	40	2.3	400	0.037	0.016	M7.4
SFHD	25.6	143	2.3	400	0.132	0.057	M7.4
MLD	6.0	54	2.3	400	0.050	0.022	M8.0
MMD	6.4	82	2.3	400	0.075	0.033	M8.05
CC	13.4	282	2.3	400	0.259	0.113	M8.12
MHD	6.3	127	2.3	400	0.117	0.051	M8.2
MLD	7.8	70	2.3	400	0.064	0.028	M8.2

FPA MASTER PLAN UPDATE
Hydraulic Model
Table A-3: Land Use and Load Details

LAND USE	AREA (ACRES)	ESDs	PEAKING FACTOR	FLOW / ESD (GPD)	DF - I&I (MGD)	AF (MGD)	ASSIGNED MH
MLD	9.6	86	2.3	400	0.079	0.034	M9.0
SFHD	13.4	75	2.3	400	0.069	0.030	M9.04
P	11.7	1	2.3	400	0.001	0.000	M9.1
PQP	9.9	40	2.3	400	0.037	0.016	M9.1
SFHD	65.7	365	2.3	400	0.336	0.146	M9.2
MLD	7.8	71	2.3	400	0.065	0.028	M9.3
GC	17.0	0	2.3	0	0.000	0.000	
GC	9.5	0	2.3	0	0.000	0.000	
GC	5.0	0	2.3	0	0.000	0.000	
GC	3.0	0	2.3	0	0.000	0.000	
GC	0.6	0	2.3	0	0.000	0.000	
GC	0.0	0	2.3	0	0.000	0.000	
HWY-50	18.2	0	0.0	0	0.000	0.000	
HWY-50	17.4	0	0.0	0	0.000	0.000	
MHD	1.7	0	2.3	0	0.000	0.000	
MHD	0.0	0	2.3	0	0.000	0.000	
MLD	27.9	0	2.3	0	0.000	0.000	
MLD	0.0	0	2.3	0	0.000	0.000	
MLD	0.0	0	2.3	0	0.000	0.000	
MLD	0.0	0	2.3	0	0.000	0.000	
MMD	0.0	0	2.3	0	0.000	0.000	
OS	118.6	0	0.0	0	0.000	0.000	
OS	108.5	0	0.0	0	0.000	0.000	
OS	65.3	0	0.0	0	0.000	0.000	
OS	55.3	0	0.0	0	0.000	0.000	
OS	48.6	0	0.0	0	0.000	0.000	
OS	45.8	0	0.0	0	0.000	0.000	
OS	45.5	0	0.0	0	0.000	0.000	
OS	35.0	0	0.0	0	0.000	0.000	
OS	28.5	0	0.0	0	0.000	0.000	
OS	26.4	0	0.0	0	0.000	0.000	
OS	21.0	0	0.0	0	0.000	0.000	
OS	21.0	0	0.0	0	0.000	0.000	
OS	20.7	0	0.0	0	0.000	0.000	
OS	19.6	0	0.0	0	0.000	0.000	
OS	18.9	0	0.0	0	0.000	0.000	
OS	18.7	0	0.0	0	0.000	0.000	
OS	18.3	0	0.0	0	0.000	0.000	
OS	16.5	0	0.0	0	0.000	0.000	
OS	15.9	0	0.0	0	0.000	0.000	

Table A-3: Land Use and Load Details

LAND USE	AREA (ACRES)	ESDs	PEAKING FACTOR	FLOW / ESD (GPD)	DF - I&I (MGD)	AF (MGD)	ASSIGNED MH
OS	13.4	0	0.0	0	0.000	0.000	
OS	13.4	0	0.0	0	0.000	0.000	
OS	13.2	0	0.0	0	0.000	0.000	
OS	13.2	0	0.0	0	0.000	0.000	
OS	12.6	0	0.0	0	0.000	0.000	
OS	12.0	0	0.0	0	0.000	0.000	
OS	11.7	0	0.0	0	0.000	0.000	
OS	11.2	0	0.0	0	0.000	0.000	
OS	10.9	0	0.0	0	0.000	0.000	
OS	9.8	0	0.0	0	0.000	0.000	
OS	9.1	0	0.0	0	0.000	0.000	
OS	8.1	0	0.0	0	0.000	0.000	
OS	7.8	0	0.0	0	0.000	0.000	
OS	7.6	0	0.0	0	0.000	0.000	
OS	7.6	0	0.0	0	0.000	0.000	
OS	6.9	0	0.0	0	0.000	0.000	
OS	5.8	0	0.0	0	0.000	0.000	
OS	5.4	0	0.0	0	0.000	0.000	
OS	5.3	0	0.0	0	0.000	0.000	
OS	5.2	0	0.0	0	0.000	0.000	
OS	5.1	0	0.0	0	0.000	0.000	
OS	4.9	0	0.0	0	0.000	0.000	
OS	4.8	0	0.0	0	0.000	0.000	
OS	4.0	0	0.0	0	0.000	0.000	
OS	4.0	0	0.0	0	0.000	0.000	
OS	4.0	0	0.0	0	0.000	0.000	
OS	3.0	0	0.0	0	0.000	0.000	
OS	2.9	0	0.0	0	0.000	0.000	
OS	2.8	0	0.0	0	0.000	0.000	
OS	2.6	0	0.0	0	0.000	0.000	
OS	2.6	0	0.0	0	0.000	0.000	
OS	2.6	0	0.0	0	0.000	0.000	
OS	2.4	0	0.0	0	0.000	0.000	
OS	2.4	0	0.0	0	0.000	0.000	
OS	2.4	0	0.0	0	0.000	0.000	
OS	2.2	0	0.0	0	0.000	0.000	
OS	1.9	0	0.0	0	0.000	0.000	
OS	1.8	0	0.0	0	0.000	0.000	
OS	1.8	0	0.0	0	0.000	0.000	
OS	1.6	0	0.0	0	0.000	0.000	

Table A-3: Land Use and Load Details

LAND USE	AREA (ACRES)	ESDs	PEAKING FACTOR	FLOW / ESD (GPD)	DF - I&I (MGD)	AF (MGD)	ASSIGNED MH
OS	1.5	0	0.0	0	0.000	0.000	
OS	1.5	0	0.0	0	0.000	0.000	
OS	1.2	0	0.0	0	0.000	0.000	
OS	1.2	0	0.0	0	0.000	0.000	
OS	1.1	0	0.0	0	0.000	0.000	
OS	1.1	0	0.0	0	0.000	0.000	
OS	1.1	0	0.0	0	0.000	0.000	
OS	1.0	0	0.0	0	0.000	0.000	
OS	1.0	0	0.0	0	0.000	0.000	
OS	0.9	0	0.0	0	0.000	0.000	
OS	0.8	0	0.0	0	0.000	0.000	
OS	0.8	0	0.0	0	0.000	0.000	
OS	0.8	0	0.0	0	0.000	0.000	
OS	0.7	0	0.0	0	0.000	0.000	
OS	0.6	0	0.0	0	0.000	0.000	
OS	0.5	0	0.0	0	0.000	0.000	
OS	0.4	0	0.0	0	0.000	0.000	
OS	0.4	0	0.0	0	0.000	0.000	
OS	0.3	0	0.0	0	0.000	0.000	
OS	0.3	0	0.0	0	0.000	0.000	
OS	0.3	0	0.0	0	0.000	0.000	
OS	0.2	0	0.0	0	0.000	0.000	
OS	0.2	0	0.0	0	0.000	0.000	
OS	0.1	0	0.0	0	0.000	0.000	
OS	0.0	0	0.0	0	0.000	0.000	
OS	0.0	0	0.0	0	0.000	0.000	
OS-LC	3.4	0	2.3	0	0.000	0.000	
OS-LC	2.3	0	2.3	0	0.000	0.000	
OS-LC	2.3	0	2.3	0	0.000	0.000	
OS-LC	2.1	0	2.3	0	0.000	0.000	
OS-LC	1.9	0	2.3	0	0.000	0.000	
OS-LC	1.9	0	2.3	0	0.000	0.000	
OS-LC	1.8	0	2.3	0	0.000	0.000	
OS-LC	1.8	0	2.3	0	0.000	0.000	
OS-LC	1.8	0	2.3	0	0.000	0.000	
OS-LC	1.5	0	2.3	0	0.000	0.000	
OS-LC	1.5	0	2.3	0	0.000	0.000	
OS-LC	1.5	0	2.3	0	0.000	0.000	
OS-LC	1.3	0	2.3	0	0.000	0.000	
OS-LC	1.2	0	2.3	0	0.000	0.000	

LAND USE	AREA (ACRES)	ESDs	PEAKING FACTOR	FLOW / ESD (GPD)	DF - I&I (MGD)	AF (MGD)	ASSIGNED MH
OS-LC	1.2	0	2.3	0	0.000	0.000	
OS-LC	1.2	0	2.3	0	0.000	0.000	
OS-LC	1.1	0	2.3	0	0.000	0.000	
OS-LC	1.1	0	2.3	0	0.000	0.000	
OS-LC	1.1	0	2.3	0	0.000	0.000	
OS-LC	1.0	0	2.3	0	0.000	0.000	
OS-LC	1.0	0	2.3	0	0.000	0.000	
OS-LC	0.9	0	2.3	0	0.000	0.000	
OS-LC	0.8	0	2.3	0	0.000	0.000	
OS-LC	0.7	0	2.3	0	0.000	0.000	
OS-LC	0.7	0	2.3	0	0.000	0.000	
OS-LC	0.7	0	2.3	0	0.000	0.000	
OS-LC	0.7	0	2.3	0	0.000	0.000	
OS-LC	0.6	0	2.3	0	0.000	0.000	
OS-LC	0.6	0	2.3	0	0.000	0.000	
OS-LC	0.6	0	2.3	0	0.000	0.000	
OS-LC	0.5	0	2.3	0	0.000	0.000	
OS-LC	0.5	0	2.3	0	0.000	0.000	
OS-LC	0.5	0	2.3	0	0.000	0.000	
OS-LC	0.5	0	2.3	0	0.000	0.000	
OS-LC	0.4	0	2.3	0	0.000	0.000	
OS-LC	0.4	0	2.3	0	0.000	0.000	
OS-LC	0.4	0	2.3	0	0.000	0.000	
OS-LC	0.4	0	2.3	0	0.000	0.000	
OS-LC	0.4	0	2.3	0	0.000	0.000	
OS-LC	0.4	0	2.3	0	0.000	0.000	
OS-LC	0.4	0	2.3	0	0.000	0.000	
OS-LC	0.4	0	2.3	0	0.000	0.000	
OS-LC	0.3	0	2.3	0	0.000	0.000	
OS-LC	0.3	0	2.3	0	0.000	0.000	
OS-LC	0.3	0	2.3	0	0.000	0.000	
OS-LC	0.2	0	2.3	0	0.000	0.000	
OS-LC	0.2	0	2.3	0	0.000	0.000	
OS-LC	0.2	0	2.3	0	0.000	0.000	
OS-LC	0.1	0	2.3	0	0.000	0.000	
OS-LC	0.1	0	2.3	0	0.000	0.000	
OS-LC	0.1	0	2.3	0	0.000	0.000	
OS-LC	0.0	0	2.3	0	0.000	0.000	
OS-LC	0.0	0	2.3	0	0.000	0.000	
OS-LC	0.0	0	2.3	0	0.000	0.000	

Table A-3: Land Use and Load Details

LAND USE	AREA (ACRES)	ESDs	PEAKING FACTOR	FLOW / ESD (GPD)	DF - I&I (MGD)	AF (MGD)	ASSIGNED MH
OS-LC	0.0	0	2.3	0	0.000	0.000	
OS-LC	0.0	0	2.3	0	0.000	0.000	
OS-LC	0.0	0	2.3	0	0.000	0.000	
P	3.8	0	2.3	0	0.000	0.000	
P	0.0	0	2.3	0	0.000	0.000	
P	0.0	0	2.3	0	0.000	0.000	
PQP	1.8	0	2.3	0	0.000	0.000	
PQP	1.3	0	2.3	0	0.000	0.000	
PQP	1.2	0	2.3	0	0.000	0.000	
PQP	0.8	0	2.3	0	0.000	0.000	
PQP	0.0	0	2.3	0	0.000	0.000	
PQP	0.0	0	2.3	0	0.000	0.000	
RW	15.8	0	2.3	0	0.000	0.000	
RW	7.8	0	2.3	0	0.000	0.000	
RW	6.4	0	2.3	0	0.000	0.000	
RW	5.0	0	2.3	0	0.000	0.000	
RW	4.8	0	2.3	0	0.000	0.000	
RW	2.9	0	2.3	0	0.000	0.000	
RW	2.5	0	2.3	0	0.000	0.000	
RW	2.3	0	2.3	0	0.000	0.000	
RW	2.0	0	2.3	0	0.000	0.000	
RW	1.5	0	2.3	0	0.000	0.000	
RW	1.0	0	2.3	0	0.000	0.000	
RW	1.0	0	2.3	0	0.000	0.000	
RW	0.9	0	2.3	0	0.000	0.000	
RW	0.9	0	2.3	0	0.000	0.000	
RW	0.8	0	2.3	0	0.000	0.000	
RW	0.7	0	2.3	0	0.000	0.000	
RW	0.7	0	2.3	0	0.000	0.000	
RW	0.6	0	2.3	0	0.000	0.000	
RW	0.6	0	2.3	0	0.000	0.000	
RW	0.5	0	2.3	0	0.000	0.000	
RW	0.4	0	2.3	0	0.000	0.000	
RW	0.4	0	2.3	0	0.000	0.000	
RW	0.3	0	2.3	0	0.000	0.000	
RW	0.3	0	2.3	0	0.000	0.000	
RW	0.3	0	2.3	0	0.000	0.000	
RW	0.3	0	2.3	0	0.000	0.000	
RW	0.2	0	2.3	0	0.000	0.000	
RW	0.2	0	2.3	0	0.000	0.000	

Table A-3: Land Use and Load Details

LAND USE	AREA (ACRES)	ESDs	PEAKING FACTOR	FLOW / ESD (GPD)	DF - I&I (MGD)	AF (MGD)	ASSIGNED MH
RW	0.2	0	2.3	0	0.000	0.000	
RW	0.2	0	2.3	0	0.000	0.000	
RW	0.2	0	2.3	0	0.000	0.000	
RW	0.2	0	2.3	0	0.000	0.000	
RW	0.2	0	2.3	0	0.000	0.000	
RW	0.1	0	2.3	0	0.000	0.000	
RW	0.1	0	2.3	0	0.000	0.000	
RW	0.1	0	2.3	0	0.000	0.000	
RW	0.1	0	2.3	0	0.000	0.000	
RW	0.1	0	2.3	0	0.000	0.000	
RW	0.1	0	2.3	0	0.000	0.000	
RW	0.1	0	2.3	0	0.000	0.000	
RW	0.1	0	2.3	0	0.000	0.000	
RW	0.1	0	2.3	0	0.000	0.000	
RW	0.1	0	2.3	0	0.000	0.000	
RW	0.1	0	2.3	0	0.000	0.000	
RW	0.1	0	2.3	0	0.000	0.000	
RW	0.1	0	2.3	0	0.000	0.000	
RW	0.0	0	2.3	0	0.000	0.000	
RW	0.0	0	2.3	0	0.000	0.000	
RW	0.0	0	2.3	0	0.000	0.000	
RW	0.0	0	2.3	0	0.000	0.000	
RW	0.0	0	2.3	0	0.000	0.000	
RW	0.0	0	2.3	0	0.000	0.000	
RW	0.0	0	2.3	0	0.000	0.000	
RW	0.0	0	2.3	0	0.000	0.000	
RW-BB	30.8	0	2.3	0	0.000	0.000	
RW-BB	18.3	0	2.3	0	0.000	0.000	
RW-BB	13.3	0	2.3	0	0.000	0.000	
RW-BB	12.9	0	2.3	0	0.000	0.000	
RW-BB	12.6	0	2.3	0	0.000	0.000	
RW-BB	10.8	0	2.3	0	0.000	0.000	
RW-BB	6.9	0	2.3	0	0.000	0.000	
RW-BB	6.3	0	2.3	0	0.000	0.000	
RW-BB	5.1	0	2.3	0	0.000	0.000	
RW-BB	3.0	0	2.3	0	0.000	0.000	
RW-BB	2.9	0	2.3	0	0.000	0.000	
RW-BB	2.5	0	2.3	0	0.000	0.000	
RW-BB	0.9	0	2.3	0	0.000	0.000	
RW-BB	0.3	0	2.3	0	0.000	0.000	

Table A-3: Land Use and Load Details

LAND USE	AREA (ACRES)	ESDs	PEAKING FACTOR	FLOW / ESD (GPD)	DF - I&I (MGD)	AF (MGD)	ASSIGNED MH
RW-BB	0.1	0	2.3	0	0.000	0.000	
RW-BB	0.0	0	2.3	0	0.000	0.000	
RW-BB	0.0	0	2.3	0	0.000	0.000	
RW-BB	0.0	0	2.3	0	0.000	0.000	
RW-BB	0.0	0	2.3	0	0.000	0.000	
SF	33.8	0	2.3	0	0.000	0.000	
SF	1.2	0	2.3	0	0.000	0.000	
SF	0.0	0	2.3	0	0.000	0.000	
SF	0.0	0	2.3	0	0.000	0.000	
SF	0.0	0	2.3	0	0.000	0.000	
SFHD	31.0	0	2.3	0	0.000	0.000	
SFHD	0.5	0	2.3	0	0.000	0.000	
SFHD	0.4	0	2.3	0	0.000	0.000	
SFHD	0.0	0	2.3	0	0.000	0.000	
SFHD	0.0	0	2.3	0	0.000	0.000	