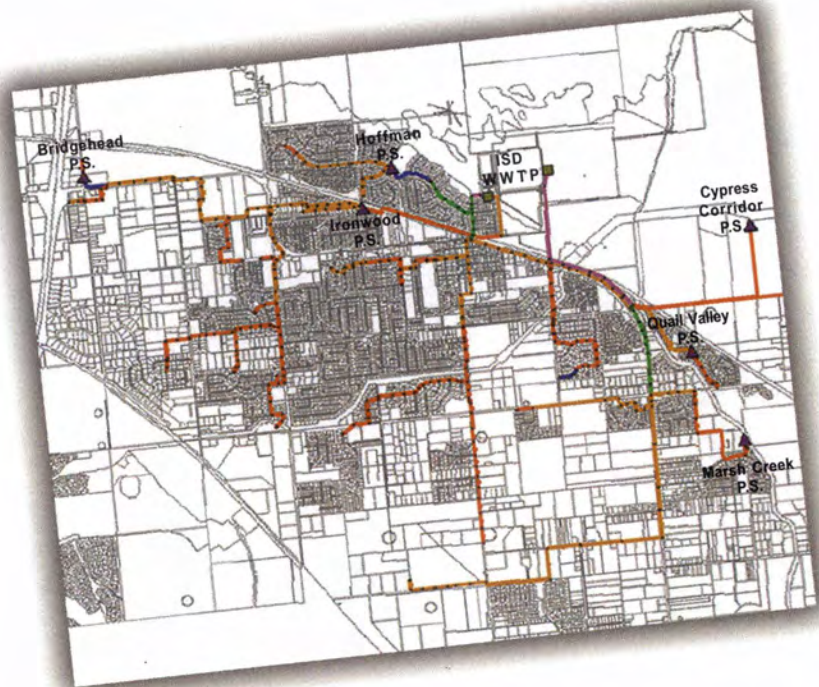




Ironhouse Sanitary District



Sewer Master Plan

January 30, 2004
(Updated February 2007)

EXECUTIVE SUMMARY

The purpose of this Sewer Master Plan is to evaluate the capacity needs of the Ironhouse Sanitary District (ISD) sewer collection system and provide guidance for capital improvement projects. This Master Plan defines the sanitary sewer collection system improvements that are necessary to accommodate future development in ISD's service area at ultimate, build-out conditions.

The objectives of this project are to:

1. Identify collection system capacity problems that consider existing and long term conditions,
2. Develop a sewer collection system computer model, using H2OMAP Sewer Version 3.5, for the capacity assessment and future use by ISD.
3. Provide ISD with a recommended Capital Improvement Program (CIP)

The ISD collection system includes approximately 85 miles of gravity pipeline, 20 miles of pressure pipelines, and 27 pumping stations. The modeled trunk line system, as it exists in July 2003, is shown in Figure ES-1.

Land use in the ISD service area consists primarily of residential and commercial use. The current average dry weather wastewater flow for the ISD service area is 2.15 mgd. Projected average and wet weather flows to the plant are 8.63 and 10.7 mgd, respectively.

Data and information on the ISD collection system, land use, and wastewater flows were incorporated into a sewer system computer model (H2OMAP Sewer Version 3.5) to facilitate sewer system analysis. Existing and future scenarios were evaluated and capacity deficiencies were identified.

Capital Improvement Program

Current problem areas within the system are limited to the large diameter pipes leading to the WWTP, which experience various levels of surcharging during peak flow periods (typically between 7 and 9 p.m.), and several sections of low-sloped pipes on Ruby Street, Second Street and near the discharge of the Laurel Heights Pumping Station. Future problems associated with increased wastewater flows in these pipes are addressed in the proposed Capital Improvement Program.

Capital improvements were developed based on the need to correct capacity deficiencies and to provide trunk line sewer service to future development within the ISD service area. The proposed Capital Improvement Program (CIP) project locations are shown in Figure ES-2 and presented in Table ES-1.

The time frames for implementation of the capital improvements are based on location and rate of growth within the ISD service area.

Figure ES-1 Existing System Modeled

Links (Diameter)

- 4" to 6"
- 8" to 14"
- 15" to 20"
- 21" to 28"
- Over 30"

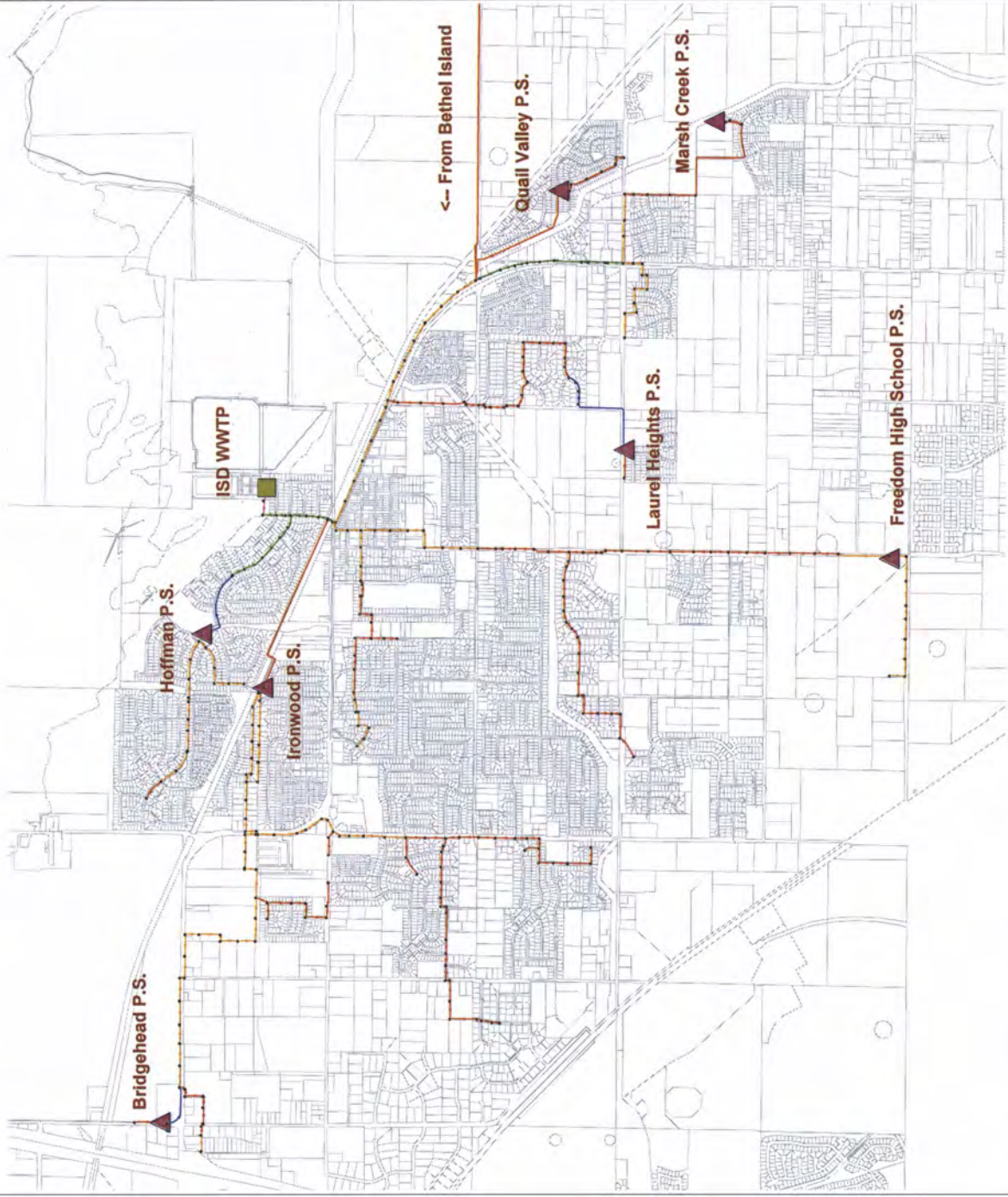


**Figure ES-2 Recommended Capital Improvement Program
Project Locations (shown in orange)**

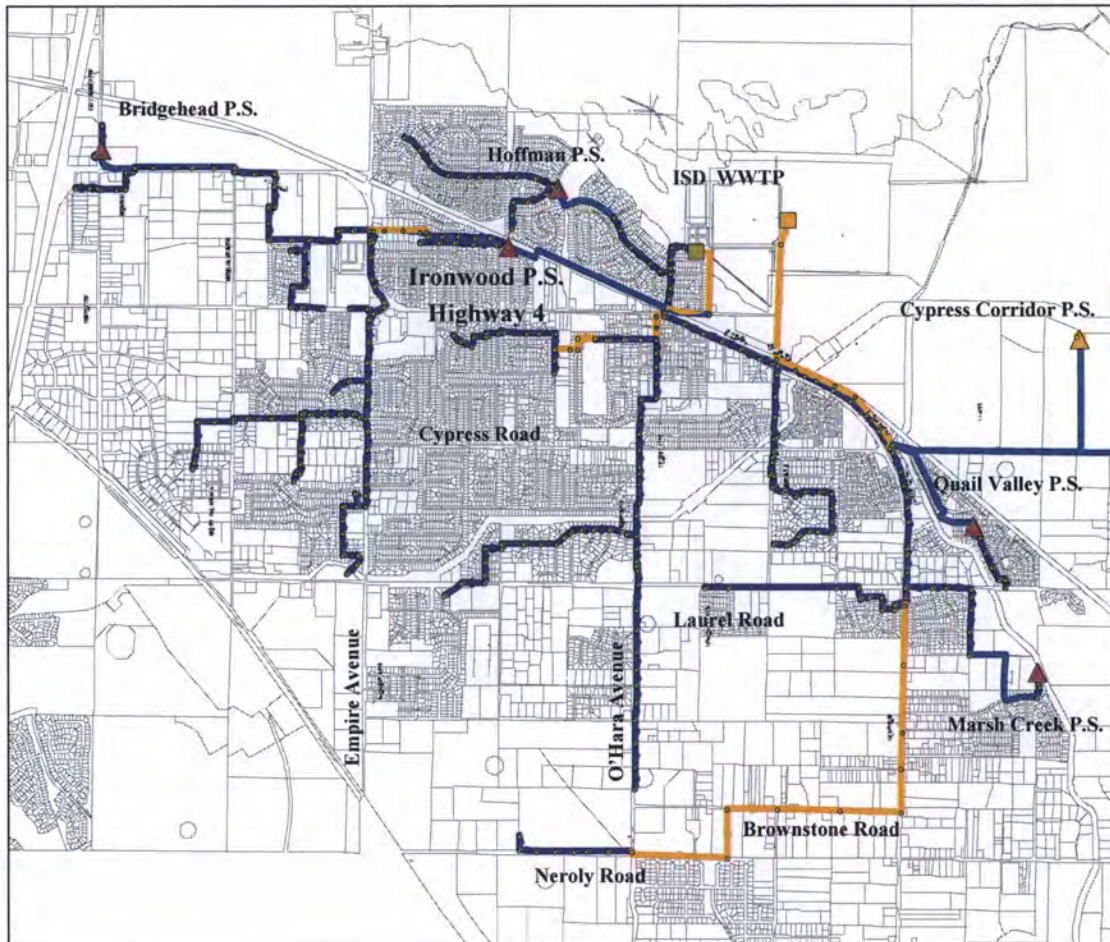
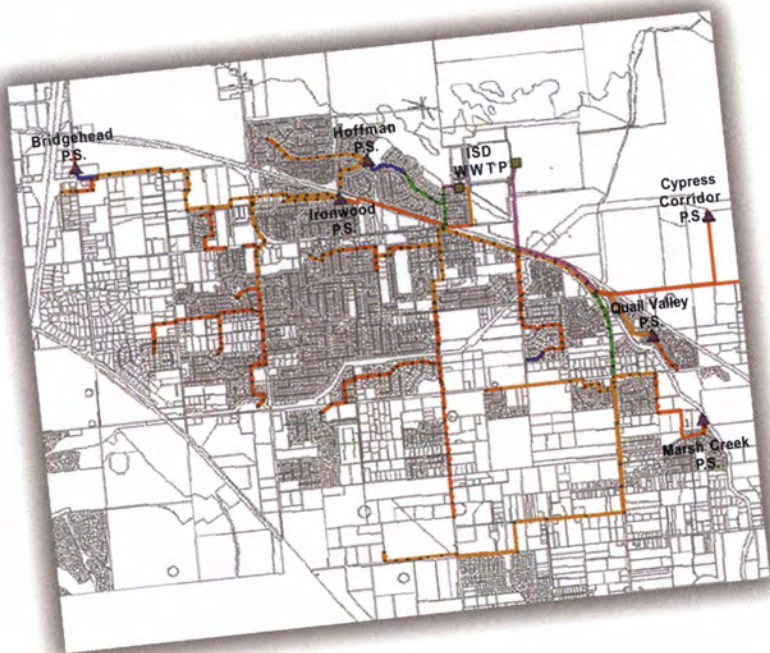


Table ES-1 Capital Improvement Program

Project Name	Total Estimated Project Costs
Neroly Road / Brownstone Road / Highway 4	\$3,118,000
Off-Island Regional Pumping Station	\$1,373,000
Cypress Corridor Pumping Station	\$1,137,000
Ruby Street / Duarte Avenue	\$304,000
Ironwood Forcemain Extension and Gravity Sewer	\$813,000
Carol Lane Relief Sewer	\$409,000
Second Street	\$257,000
Highway 4	\$5,089,000 (add \$1,134,000 for interim connection)
Ironwood, Quail Valley and Marsh Creek Pump Station Upgrades	\$378,000
WEB-14 Pump Station Upgrade	\$2,000,000
14-inch Forcemain	\$3,000,000
Total Capital Improvement Program Costs	\$17,878,000 (\$19,012,000 with interim connection)



CHAPTER 1

Introduction

CHAPTER 1

INTRODUCTION

Ironhouse Sanitary District (ISD) is located in Contra Costa County and serves the City of Oakley, Bethel Island and other local unincorporated regions of the County. ISD's service area is illustrated in Figure 1-1. The current population served by ISD is approximately 31,000 people.

1.1 System Description

The ISD collection system includes approximately 85 miles of gravity pipeline, 20 miles of pressure pipelines, and 27 pumping stations. The sanitary sewer collection system conveys wastewater to the Ironhouse Sanitary District Wastewater Treatment Plant (WWTP), located in northern Oakley. The WWTP has a dry weather flow capacity of 3 million gallons per day (mgd), with a current average dry weather flow of 2.15 mgd. The treatment train consists of a parshall flume, grinder, two 42-inch diameter screw pumps, two parallel, two stage aerated ponds and disinfection facilities. Disposal facilities consist of approximately 350 acre-feet (114 MG) of treated effluent storage, with recycled water applied to 212 acres of "mainland" agricultural land adjacent to the WWTP and to 333 acres on Jersey Island.

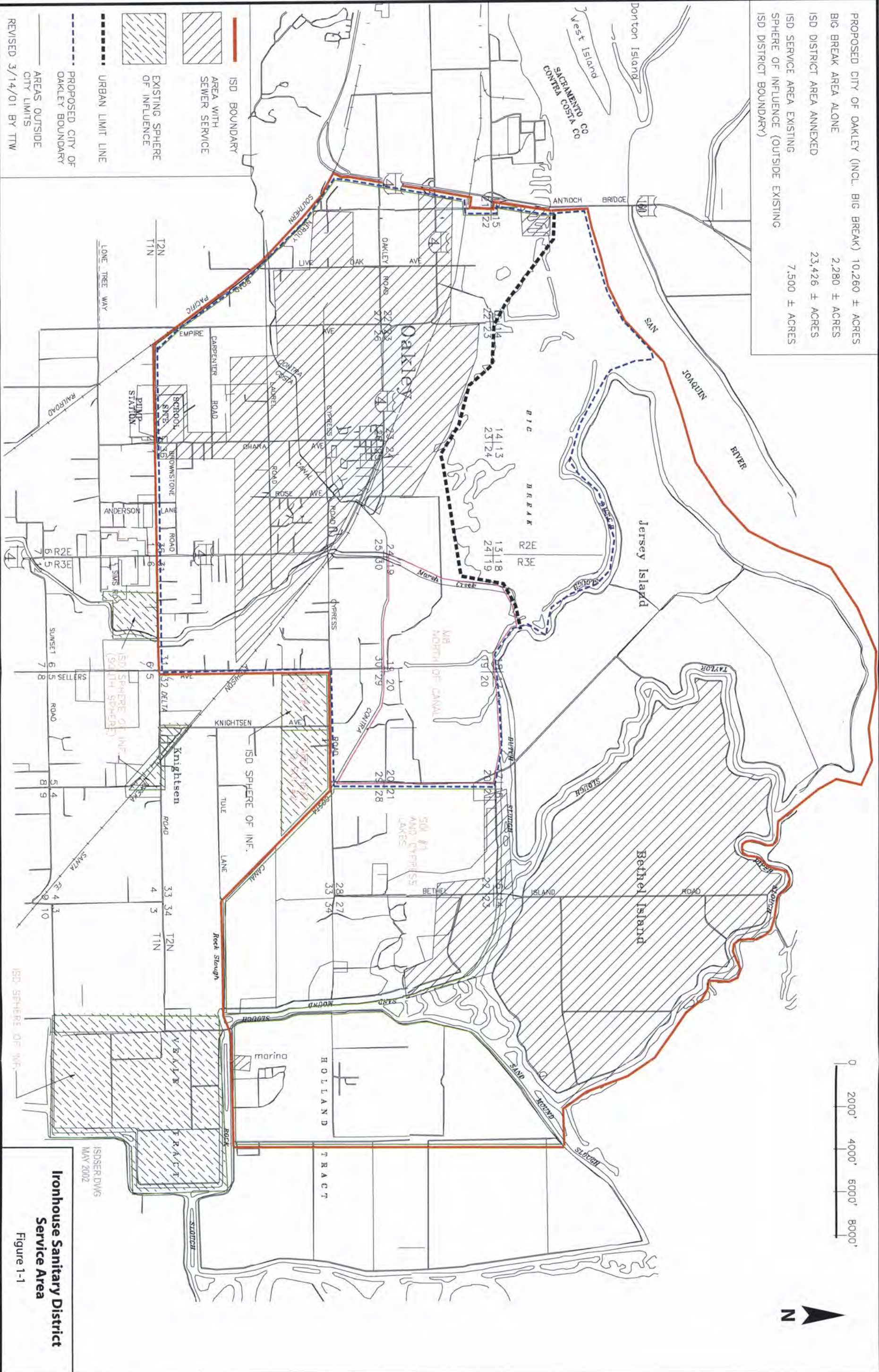
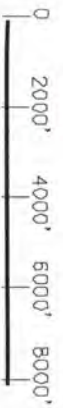
Specific data regarding the collection system were obtained from ISD, which is responsible for maintaining all public sewer infrastructure within the ISD service area. ISD provided sewer system drawings and a pipeline database of existing sewer collection pipelines within ISD. Pipeline alignment, diameter, length and (in some cases) pipe material were taken from these sources. Rim elevations were estimated using topographic maps of the area.

The ISD collection system consists of 4-inch to 30-inch pipelines. In general, only those gravity pipelines with a diameter of 12-inches or larger were considered part of the main trunk sewer system and were included in the modeling effort. However, smaller pipelines were included in the study if they represent necessary links between existing developments and the trunk sewer system and would likely serve future developments upstream. Likewise, pump stations were included in the study if they discharged to or collected flow from elements of the trunk sewer system or will serve significant areas of ISD in the future. Pump station operation criteria were obtained for the eight pump stations included in this study. Figure 1-2 illustrates the elements of the sewer system included in the H2OMAP Sewer Model.

1.2 Project Purpose and Objectives

ISD retained Raines, Melton and Carella, Inc. (RMC) to update the ISD Trunk Line Master Plan (TLMP) that was completed in 1988. The purpose of the new Sewer Master Plan is to reevaluate ISD's sewer system and provide guidance on capital improvement

PROPOSED CITY OF OAKLEY (INCL. BIG BREAK) 10,260 ± ACRES
BIG BREAK AREA ALONE 2,280 ± ACRES
ISD DISTRICT AREA ANNEXED 23,426 ± ACRES
ISD SERVICE AREA EXISTING 7,500 ± ACRES
SPHERE OF INFLUENCE (OUTSIDE EXISTING ISD DISTRICT BOUNDARY)



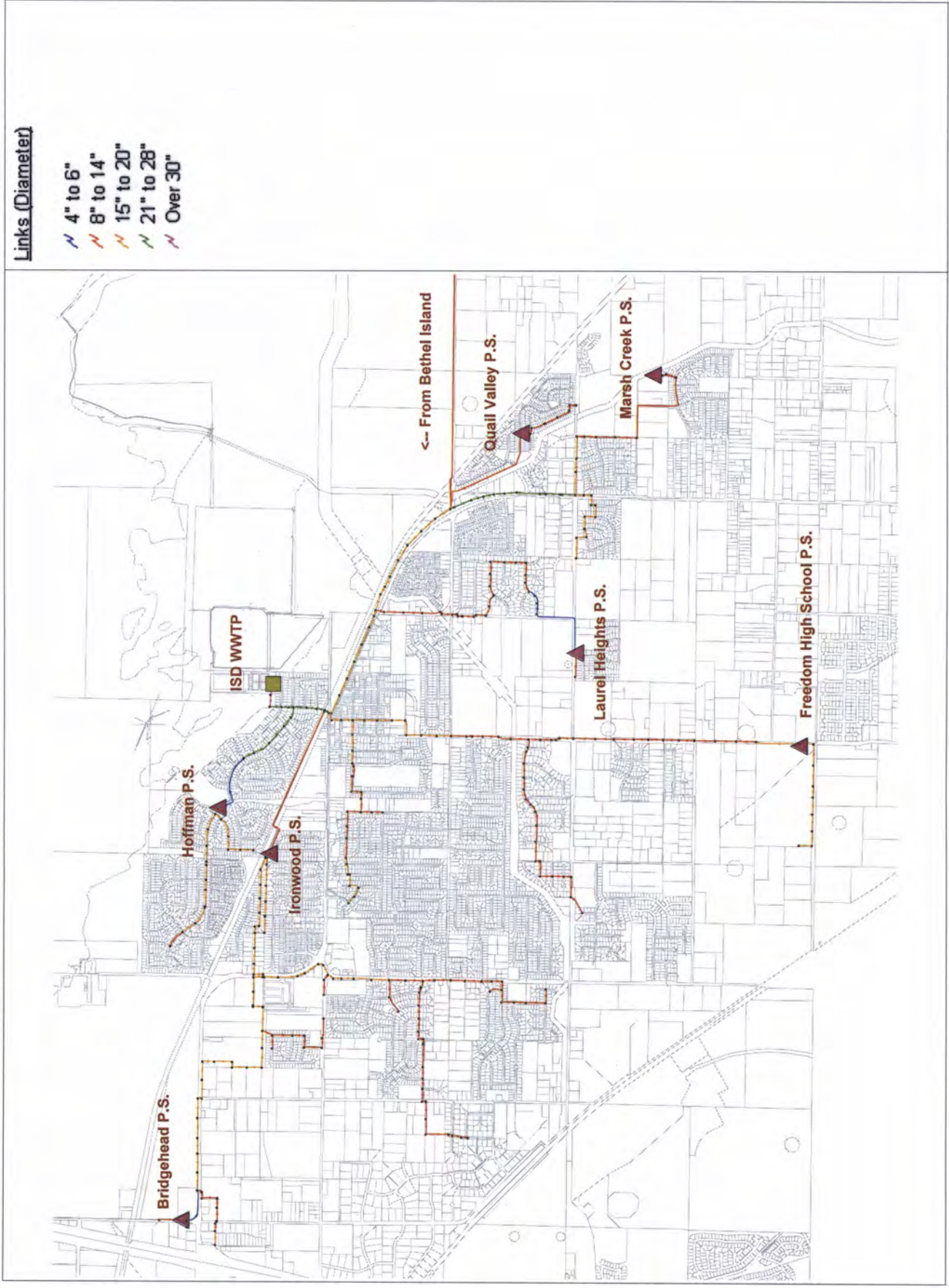
ISD BOUNDARY
AREA WITH SEWER SERVICE
EXISTING SPHERE OF INFLUENCE
URBAN LIMIT LINE
PROPOSED CITY OF OAKLEY BOUNDARY
AREAS OUTSIDE CITY LIMITS
REVISED 3/14/01 BY TTW

Ironhouse Sanitary District Service Area

Figure 1-1

ISSER.DWG
MAY 2002

Figure 1-2 Existing System Modeled



projects for ISD. Significant development has and is expected to occur with ISD's sphere of influence that was not accounted for in the 1988 TLMP. The City of Oakley recently completed a Draft General Plan which provides a road map for future development over the next 10 to 20 years within the City. The Sewer Master Plan is required so that ISD can implement a robust sewer system that limits sewer overflows and associated sanitary health and environmental impacts.

The goals and objectives are this project are to:

1. Identify capacity problems that consider existing and long term conditions,
2. Develop a sewer system computer model, using H2OMAP Sewer Version 3.5, for the capacity assessment and future use by ISD.
3. Provide ISD with a recommended Capital Improvement Program (CIP)

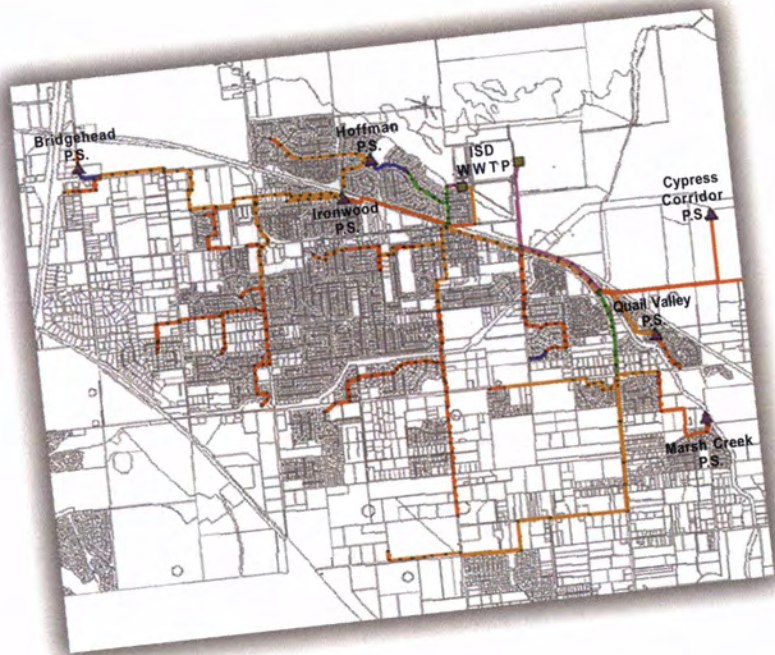
1.3 Report Content

The report is divided into 6 chapters, as outlined below:

- CHAPTER 1 – INTRODUCTION provides an overall system description and project purpose and objectives.
- CHAPTER 2 – LAND USE describes the available land use databases and discusses existing and future land use data to be used in wastewater flow analysis.
- CHAPTER 3 – WASTEWATER FLOW discusses the basis for sanitary flow projections for ISD based on land use information presented in Chapter 2.
- CHAPTER 4 – SEWER SYSTEM ANALYSIS presents the capacity assessments used to identify system deficiencies and potential issues to be considered in the CIP.
- CHAPTER 5 – CAPITAL IMPROVEMENT PROGRAM presents the sewer projects proposed to mitigate the deficiencies identified in Chapter 4 and serve future developments.

This report also contains two appendices:

APPENDIX A – H2OMAP SEWER MODEL OUTPUT
APPENDIX B – PIPELINE COSTING



CHAPTER 2

Land and Use

CHAPTER 2 LAND USE

2.1 LAND USE DATABASE

The City of Oakley General Plan includes a comprehensive GIS-based land use database for all existing parcels within the City of Oakley as well as within the City's area of likely expansion. This GIS information, as provided to RMC by Pacific Municipal Consultants (PMC), is shown in Figure 2-1. This information provides the basis for both existing and future land use projection within the ISD service area. Aerial photographs taken within ISD's service area were used to determine which parcels were developed under the existing conditions and which were to be included as future developments. Regions of ISD's sphere of influence not classified as a part of the City's land use database, including Veale Tract, Holland Tract and the area next to SOI #2, have been designated by the Contra Costa County General Plan as agricultural areas outside of the County's urban limit line. These areas are not expected to contribute significant flows to ISD.

2.2 LAND USE DESIGNATIONS

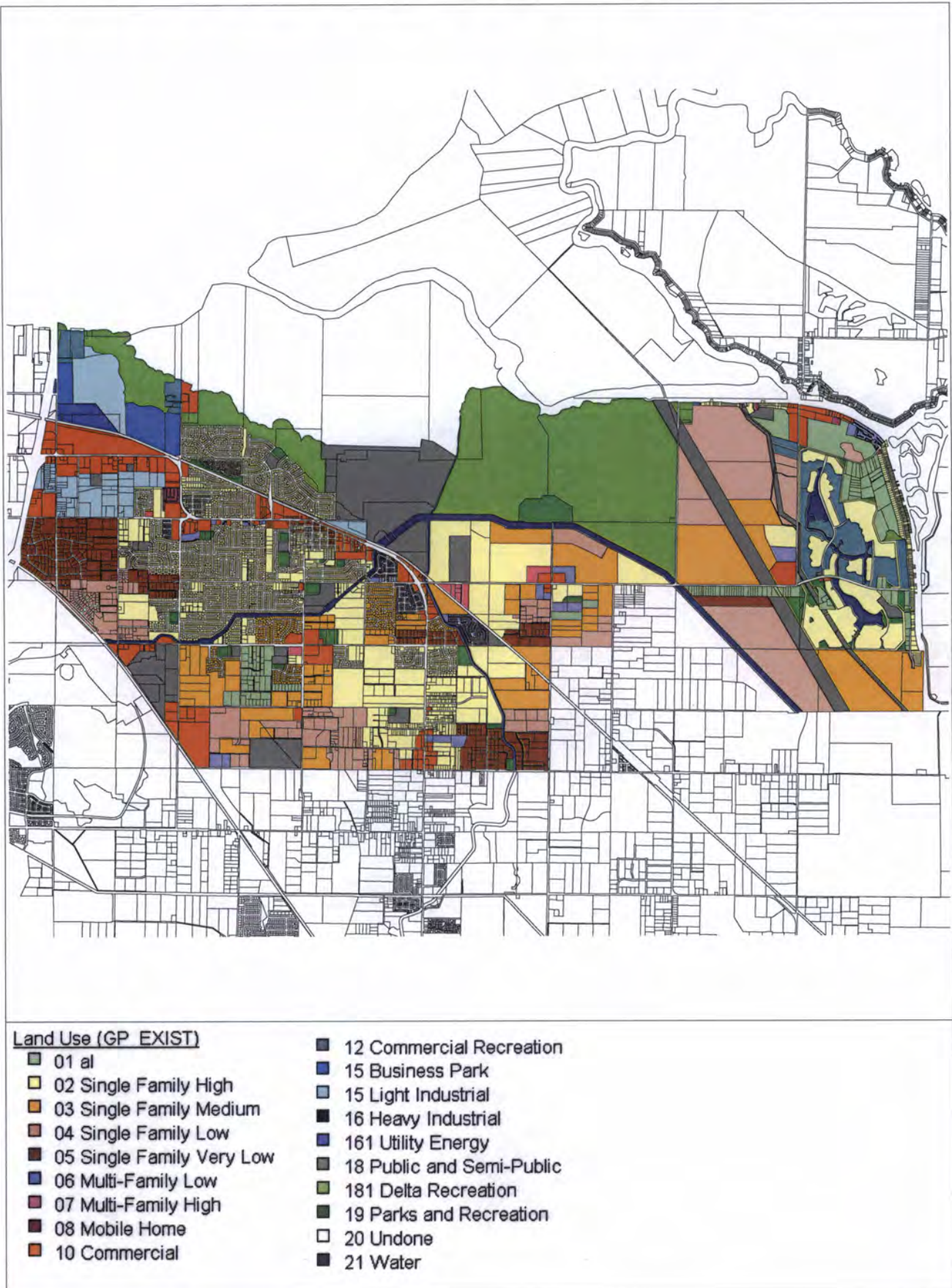
Land use classification assigned by the City of Oakley General Plan categorizes all parcels as residential, commercial, industrial, recreational or public and semi-public land uses. The vast majority of Oakley is, as it will be in the future, developed as residential communities of varying densities. These densities are used to further classify residential regions. Assumed densities are summarized in Table 2-1.

Table 2-1 Residential Development Densities

Residential Designations	Density within City ¹ (dwelling units per acre)	Density Outside City Limits ² (dwelling units per acre)	
		Low	High
Agricultural Limited	1.0	0.2	0.2
Single Family Very Low	1.0	0.2	0.9
Single Family Low	2.3	1.0	2.9
Single Family Medium	3.8	3.0	4.9
Single Family High	5.5	5.0	7.2
Multi-Family Low	9.6	7.3	11.9
Multi-Family High	16.7	21.0	29.9
Mobile Home	9.6	1.0	12.0

1 Source: City of Oakley General Plan (Draft)

Figure 2-1 City of Oakley Draft General Plan Land Use Map



2 Source: Contra Costa County General Plan

Land use characteristics, such as housing and population density, can be combined with unit wastewater flow factors and diurnal flow patterns to generate and distribute sanitary flow in the sewer system hydraulic model. Base wastewater flows are expressed in terms of gallons per day per acre or person and vary with the type of land use. Flow factors used for various land uses are discussed in Chapter 3.

The GIS parcel layers were used as the basis to import the land use information (including parcel acreage and land use designation) into the hydraulic model to generate base wastewater flows. Within the GIS database, large parcels with existing residential developments were already subdivided into residential lots. Each existing lot was linked to the appropriate modeled manhole within the system. Parcels that had not been subdivided at the time the GIS database was created were assigned to appropriate manholes in the existing or future wastewater system based on a series of criteria:

- Topography. Flows were assigned in accordance with the natural slope of the region, towards one of the existing trunk sewers.
- Existing Capacity. When the capacity of the existing trunk sewers is predicted to be exceeded, flows from future developments are either routed to alternate trunk sewers, new trunk sewers are added to the system, or existing lines are upgraded.
- Barriers to Flow. The ISD service area is bisected by a number of obstacles to flow. Most notable are Marsh Creek, the Contra Costa Canal, a major railroad line, and California Highway 4 (Main Street). A crossing of any of these entities will be accompanied by special sewer design, construction, permitting and potential environmental studies, all of which will contribute to relatively high capital costs. Thus, crossing of these obstacles or work within their rights of way are minimized.
- ISD staff input. Previous studies have been conducted to assess viable trunk sewer routes, particularly with respect to topography. In addition, sewer stubs have often been installed to connect existing trunk lines to potential trunk line extensions. This information has been gathered and considered in developing recommended trunk sewer alignments.

Large, undeveloped parcels were not necessarily assigned to one particular modeled manhole. Instead, the criteria noted above were used to subdivide the undeveloped parcels, with flow from the subdivided areas routed to the appropriate modeled manholes. Figures 2-2, 2-3 and 2-4 illustrate the drainage patterns assumed for undeveloped portions of west, central and east Oakley, respectively.

Figure 2-2 Assumed Drainage Pattern for West Oakley

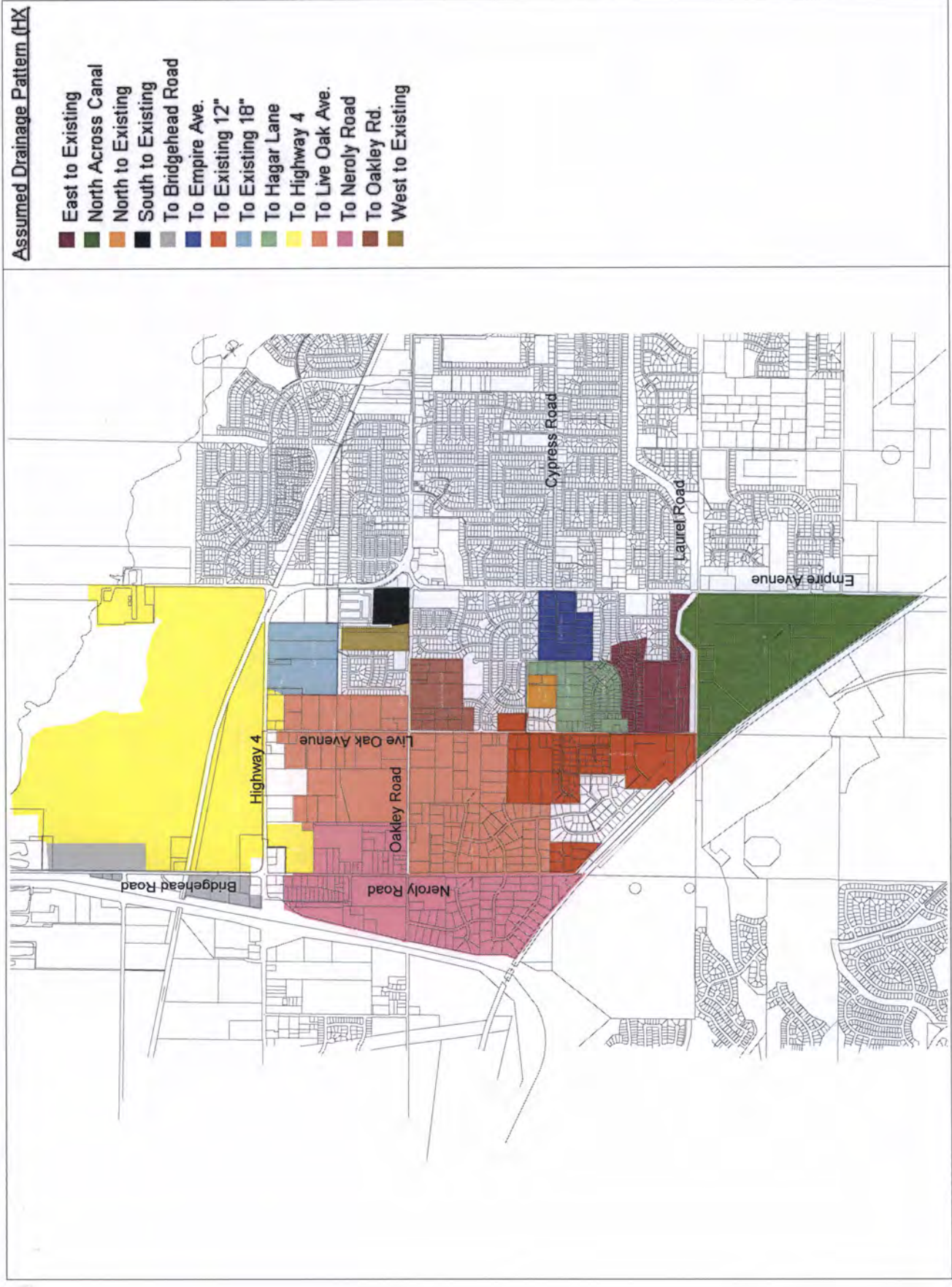


Figure 2-3 Assumed Drainage Pattern for Central Oakley

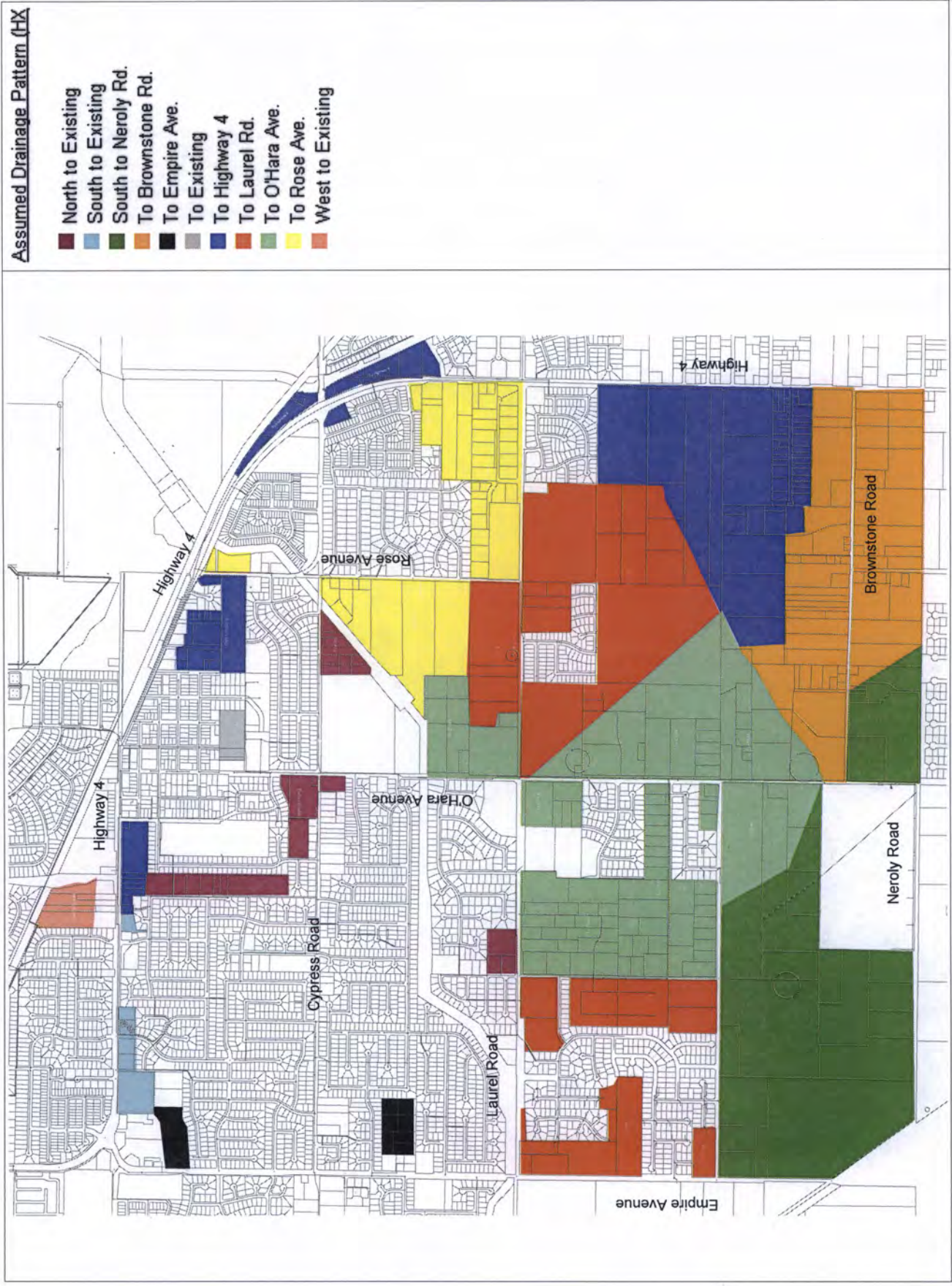
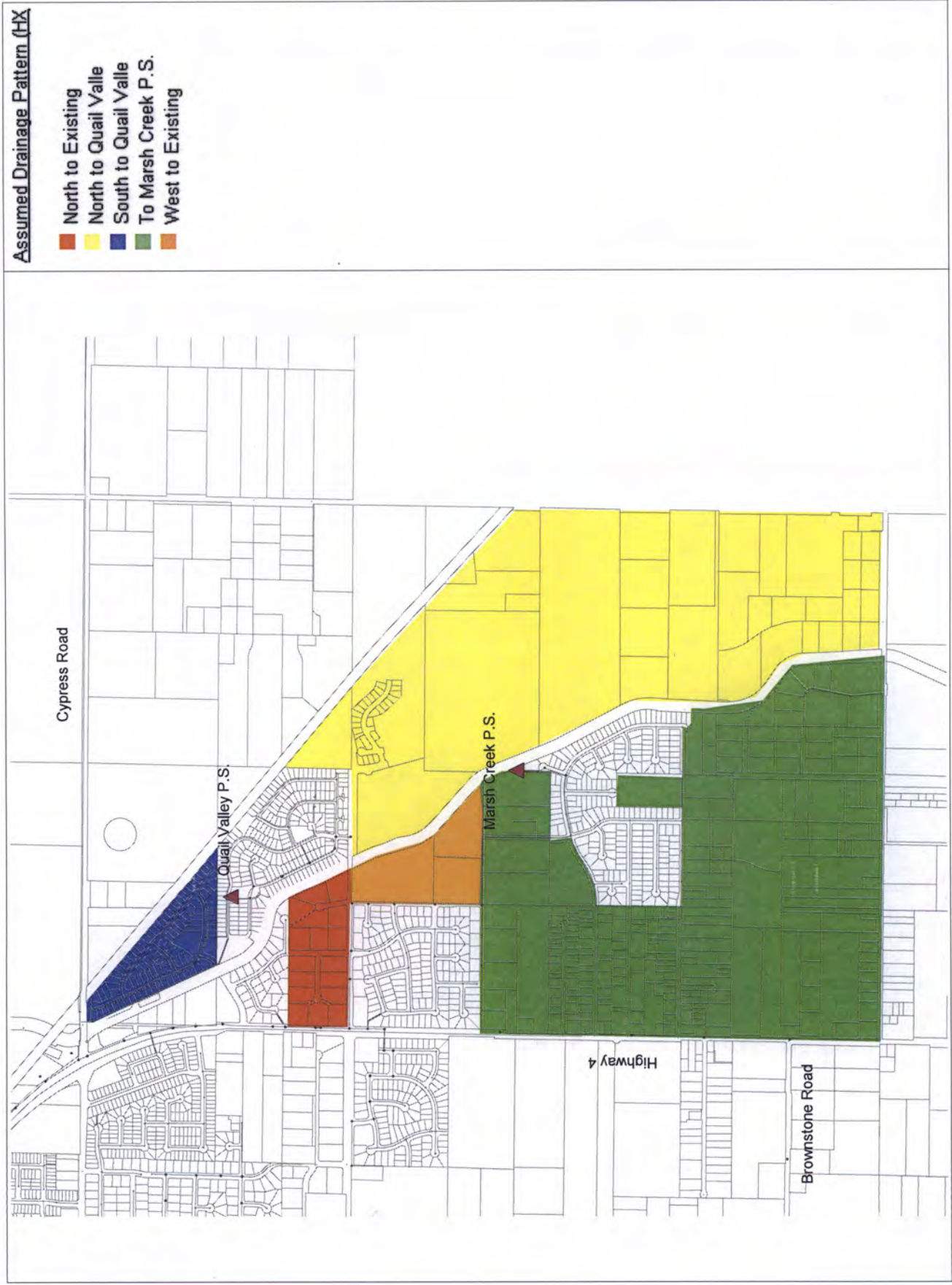


Figure 2-4 Assumed Drainage Pattern for East Oakley



2.3 BETHEL ISLAND

No land use database is available for Bethel Island. In the absence of database information, projected flows for the Island were developed based on population projections. Several population studies have been completed to date to estimate the future population of Bethel Island. Table 2-1 summarizes the results of these studies.

Table 2-1: Bethel Island Build-Out Population

Method	Population
Contra Costa Transportation Authority's Land Use Information System, 2.26 persons/unit.	9,818
Contra Costa Transportation Authority's Land Use Information System, City of Oakley densities	13,995
City of Oakley Cypress Road Planning Area Development Study	9,076

To be consistent with the City of Oakley's planning, a future year 2025 population of 9,076 was assumed for Bethel Island. Bethel Island's current population, according to 2000 Census data, is 2,312.

Unit flows assigned within the model are discussed in Chapter 3.



CHAPTER 3

Wastewater Flow

CHAPTER 3 WASTEWATER FLOW

3.1 Existing Flows

Wastewater flow is the primary parameter used to evaluate collection system capacity. Monitored wastewater flows were used to develop flow factors, calibrate the H2OMAP Sewer model, and investigate infiltration and inflow. ISD monitors wastewater flow at two locations with its collection system: the WWTP and at the point where flows from Bethel Island and off-island areas in the vicinity are combined. No other flow monitoring is performed.

Ideally, a flow monitoring program is used to obtain additional flow data that would be used for calibration of the flow model and assessment of groundwater infiltration (GWI) and rainfall dependent inflow and infiltration (RDI/I). However, due to budget limitations, the Sewer Master Plan was developed based on the existing data. While ISD WWTP influent flow is continuously monitored, data is saved only for a period of ten days and is not archived for future reference. Similarly, flow through the Bethel Island flow meter is not archived for reference.

Typically, wastewater flow can be broken down into several distinct flow components: base wastewater flow (BWF), GWI and RDI/I.

3.1.1 Base Wastewater Flow (BWF) and Ground Water Infiltration (GWI)

BWF is defined as the wastewater flow that is generated and discharged into the collection system through service connections (e.g. residential, commercial, and municipal flows). BWF is modeled in H2OMAP Sewer using the following parameters associated with each parcel:

- Unit BWF factors, in gallons per day per acre (gpad), which are combined with existing land use information (acreage) to calculate the average BWF.
- Diurnal flow patterns, which are applied to the average BWF to model hourly flow variations.

The existing ISD average daily flow of 2.15 mgd was modeled as the combination of two components: BWF and GWI. It is assumed that GWI contributes to non-wet weather flows due to the relatively high water table within the ISD service area. This is particularly true of the Bethel Island and off-island areas in the vicinity of Bethel Island. Unit BWF and GWI flows for the existing commercial and residential land uses were adjusted until the calculated total flows compared reasonably well with the measured flows at the WWTP. Unit BWF for schools and commercial establishments were set based on previous RMC experience. Schools are assumed to generate 10 gpd per student. The same factors that were used to calculate existing BWF and GWI were used to

calculate the future BWF and GWI. For this study, two GWI assumptions were used. For areas with known high groundwater, such as Bethel Island and future developments along Cypress Road east of the Atchison Topeka & Santa Fe railroad line, 300 gpad was used for the GWI contribution. For other areas within the ISD service area, the GWI contribution used was 50 gpad.

Table 3-1 presents the assumed values for BWI and GWI for ISD.

Table 3-1: Unit BWI and GWI Factors for Land Use Categories

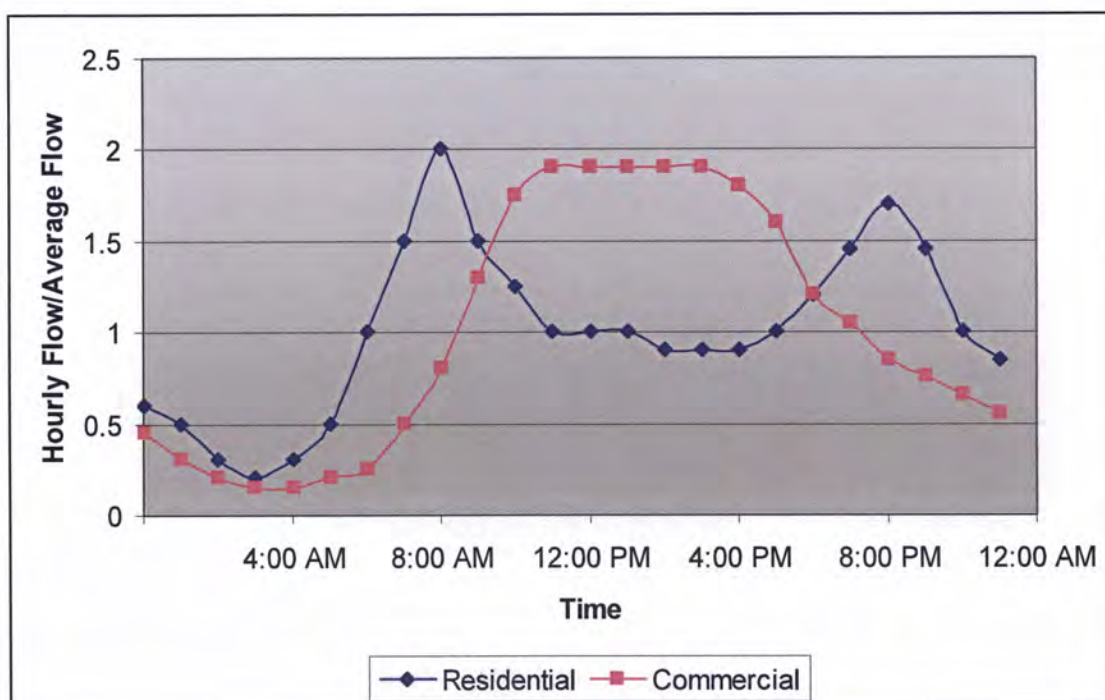
LAND USE	Base Wastewater Flow	Ground Water Infiltration	
		Low Groundwater (gpad)	High Groundwater (gpad)
RESIDENTIAL	(gallons per dwelling unit)		
Agriculture Limited	225	50	300
Single Family Very Low	225	50	300
Single Family Low	225	50	300
Single Family Medium	225	50	300
Single Family High	225	50	300
Multi-Family Low	200	50	300
Multi-Family High	200	50	300
Mobile Home	225	50	300
	(gpad)		
COMMERCIAL	1,000	50	300
LIGHT INDUSTRIAL	1,200	50	300

Flow from regions of ISD with high groundwater was projected based upon existing flow and population data for these regions. High groundwater regions include Bethel Island and off-island areas adjacent to the Island. Average flow from these regions, inclusive of GWI, are approximately 0.43 mgd. Recent census data for Bethel Island and Contra Costa County Traffic Authority estimates of off-island populations indicate that this corresponds to a per capita flow of 140 gpcd and 300 gpd per dwelling unit. The per capita value has been applied to the projected population of Bethel Island to project a future flow rate of 1.3 mgd from the Island. The dwelling unit value has been applied to high groundwater regions of ISD to project flows from these regions. Assuming the same BWF from high and low ground water areas, this corresponds to GWI of about 300 gpad in high ground water areas.

Diurnal curves for various land uses can typically be developed from flow data. However, there were insufficient flow data to develop specific diurnal curves for ISD

land uses. Therefore, generic diurnal curves were used as illustrated in Figure 3-1. Per ISD input, the peak flow for residential land use was assumed at two times average daily flow. For static analysis of a system, this peak value is known as the peaking factor, and for this analysis was set at two. Based upon previous studies performed by ISD, this value is used as the design peaking factor for the collection system.

Figure 3-1: Diurnal Curves for Residential and Commercial Land Uses

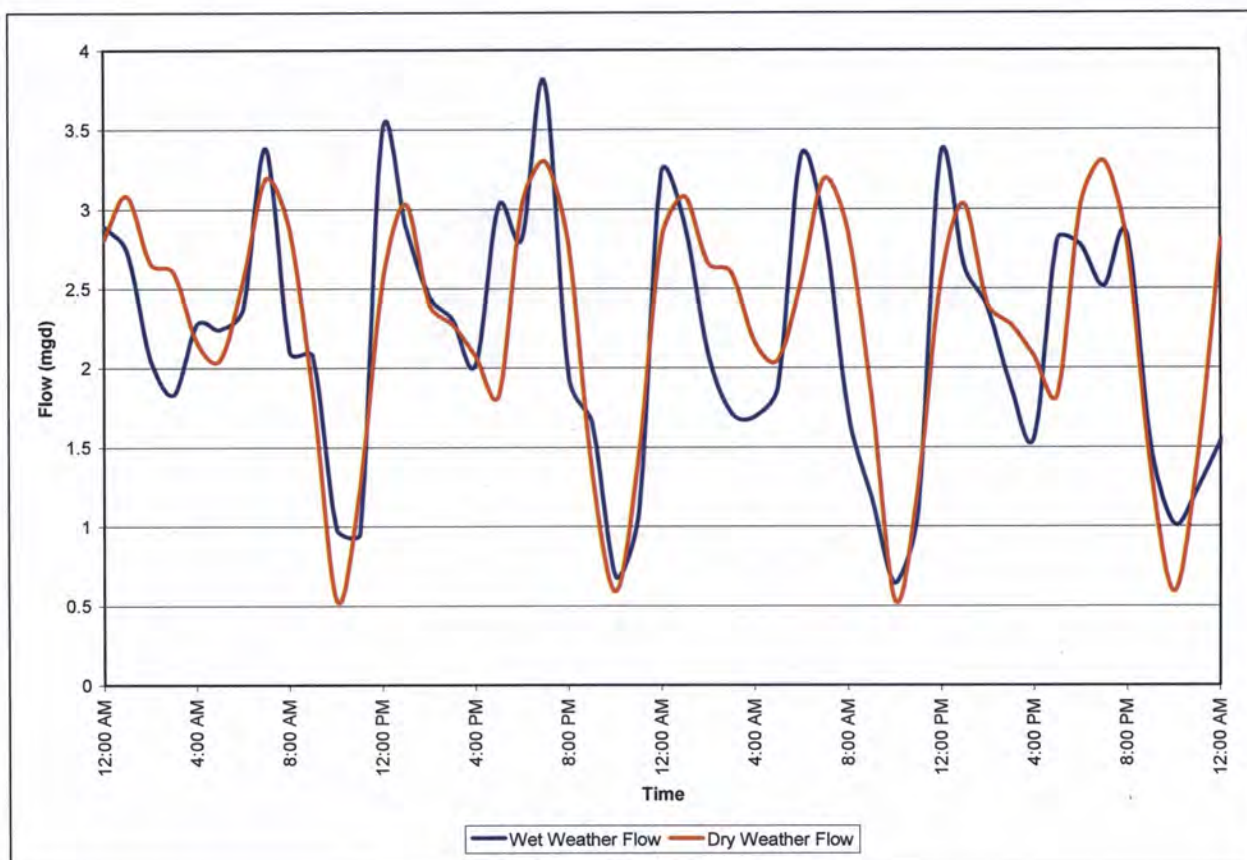


3.1.2 Rainfall-Dependent Infiltration and Inflow

RDI/I is a function of rainfall events that result in storm water entering the collection system through pipeline joints, collection system fractures, and illegal connections.

Limited wet weather flow data is available to assess ISD's RDI/I value. It is known from WWTP influent flow data that ISD does not experience large flow increases during typical wet weather events, indicating that RDI/I is not a large problem in the ISD collection system. Storm data was gathered for one storm during the month of April 2003 and is shown below in Figure 3-2. Data was also collected for a dry weather period prior to the storm. Flows for the dry and wet weather period are not different to a statistically relevant degree, validating that RDI/I is not a large problem.

Figure 3-2: Dry Weather and Wet Weather WWTP Flows (48 hours)

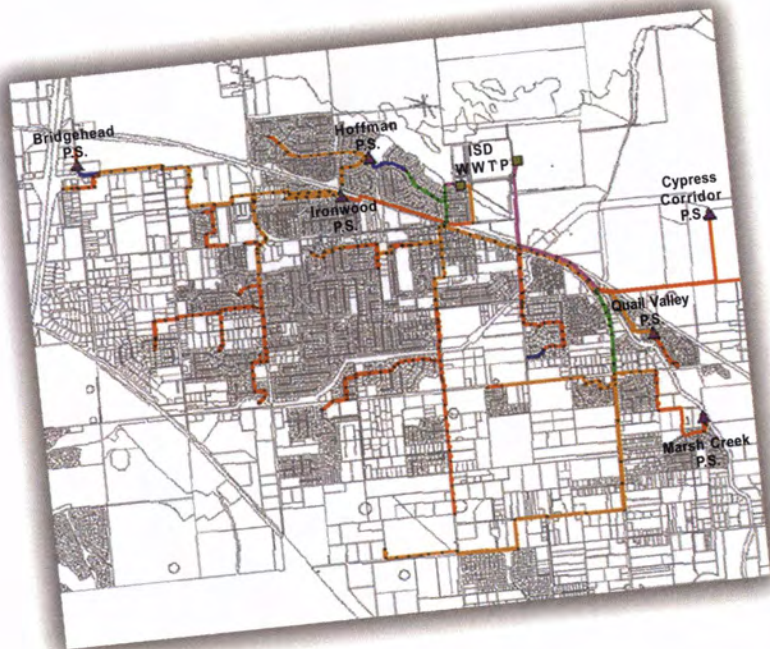


It is known that the WWTP saw a one-time average day peak flow of 2.9 mgd in the wet month of December 2002, and that the Bethel Island flow meter recorded a one time high value of 1 mgd during this same time period. The increase over average flows for the WWTP and Bethel Island region are 0.75 mgd and 0.57 mgd, respectively. It was assumed that the remainder of the WWTP excess flow, or 0.18 mgd, is attributable to RDI/I from the City of Oakley. From Contra Costa County Flood Control and Water Conservation District's "Precipitation Duration-Frequency-Depth" curves, a 10-year storm event with 6-hour duration in the ISD service area equates to 1.4 inches of rain. Taking the 0.18 mgd and spreading it over the sewerage acreage of Oakley, this value corresponds to approximately 1% of a 10-year frequency storm event. 1% is a reasonable value for a system that experiences low RDI/I effects. Therefore, an RDI/I value of 0.18 mgd, will be applied over the ISD service area to account for RDI/I within ISD. Within the model, total RDI/I is applied over a 6-hour time period to create a 6-hour precipitation event.

Total Flow predicted within ISD, as calibrated within the model, are presented in Table 3-2.

Table 3-2 Projected Wastewater Flows

Condition	Current Flows	Future Flows
Dry Weather Flow		
City of Oakley	1.74	7.36
Bethel Island	0.43	1.27
Total	2.17	8.63
Wet Weather		
City of Oakley	1.92	8.29
Bethel Island	1.00	2.41
Total	2.92	10.7



CHAPTER 4

Sewer System Analysis

CHAPTER 4

SEWER SYSTEM ANALYSIS

4.1 Capacity Assessment

The purpose of the capacity assessment is to identify pipelines with capacity deficiencies under existing and future conditions. Capacity assessments are typically completed with a computer model. For this Master Plan, H2OMAP Sewer was selected as the hydraulic modeling software. H2OMAP Sewer is a proprietary modeling program developed by MWHSoft, Inc.

This section summarizes the development of the ISD H2OMAP Sewer model, the system analysis criteria and the results of the capacity assessment.

4.1.1 H2OMAP Sewer Model Development

As discussed in the previous chapters, development of a computer model requires a number of inputs including collection system information, wastewater flow and other characteristics. In general, the modeled collection system for ISD consists of pipelines 12-inches and larger in diameter and eight¹ pumping stations, though smaller pipelines were included where required for continuity. Manholes along the modeled pipelines were included in the model and are used as nodes to route flows through associated pipelines. A land use parcel layer was used as the basis to assign flows to nodes.

The pump stations within the ISD service area operate based on level set points in each pump station's wet well. These pump stations were modeled to reflect actual pump station design and were calibrated to reflect actual pump station running times. Because actual pump operating conditions, such as the physical condition of forcemains and impellers, are not known, this calibration presents the best method for enforcing real-world operation on the modeled system. For example, the Bethel Island forcemain is known to be a low velocity line under current conditions. Such low velocities will have allowed debris to settle in the pipeline over the course of time, greatly reducing its effective conveyance area and reducing the overall capacity of the line. The extent of this problem is not known and cannot be accurately modeled, so Bethel Island Main Pump Station and WEB-14 were calibrated based on ISD's estimated flow values for these two stations. Where other pump stations operated out of line with actual pump station operation data (in terms of hours running per day or unrealistic wetwell levels), these pump stations were also calibrated to match real world operation data.

¹ Due to model limitations, Bethel Island Main Pump Station and WEB-14 were combined into a single pump station within the model. ISD has performed previous studies to assess the pumping capacity of these stations during simultaneous operation. This condition was modeled to create worst case conditions downstream of the pump stations.

Table 4-1 summarizes the criteria and assumptions that were used for the analysis of the ISD collection system.

Table 4-1: Modeling and System Analysis Criteria

System Parameter	Criteria
Modeled Pipeline	All 12-inch and above, limited smaller diameters for continuity
Manning Coefficient for PVC Pipe	0.012
Minimum Velocity (Gravity and Pressure)	2 ft/sec (at least once per day)
Maximum Velocity	5 ft/sec
PVC Hazen Williams Coefficient	130
Ductile Iron Hazen Williams Coefficient	100
Manhole diameter	4 feet
Lift Stations	Calibrated per operation data
Diurnal Curves	One generic diurnal curve for residential use. One generic diurnal curve for commercial/industrial/school use.
Wastewater Flows	As described in Sections 2 and 3

4.1.2 Capacity Analysis Criteria

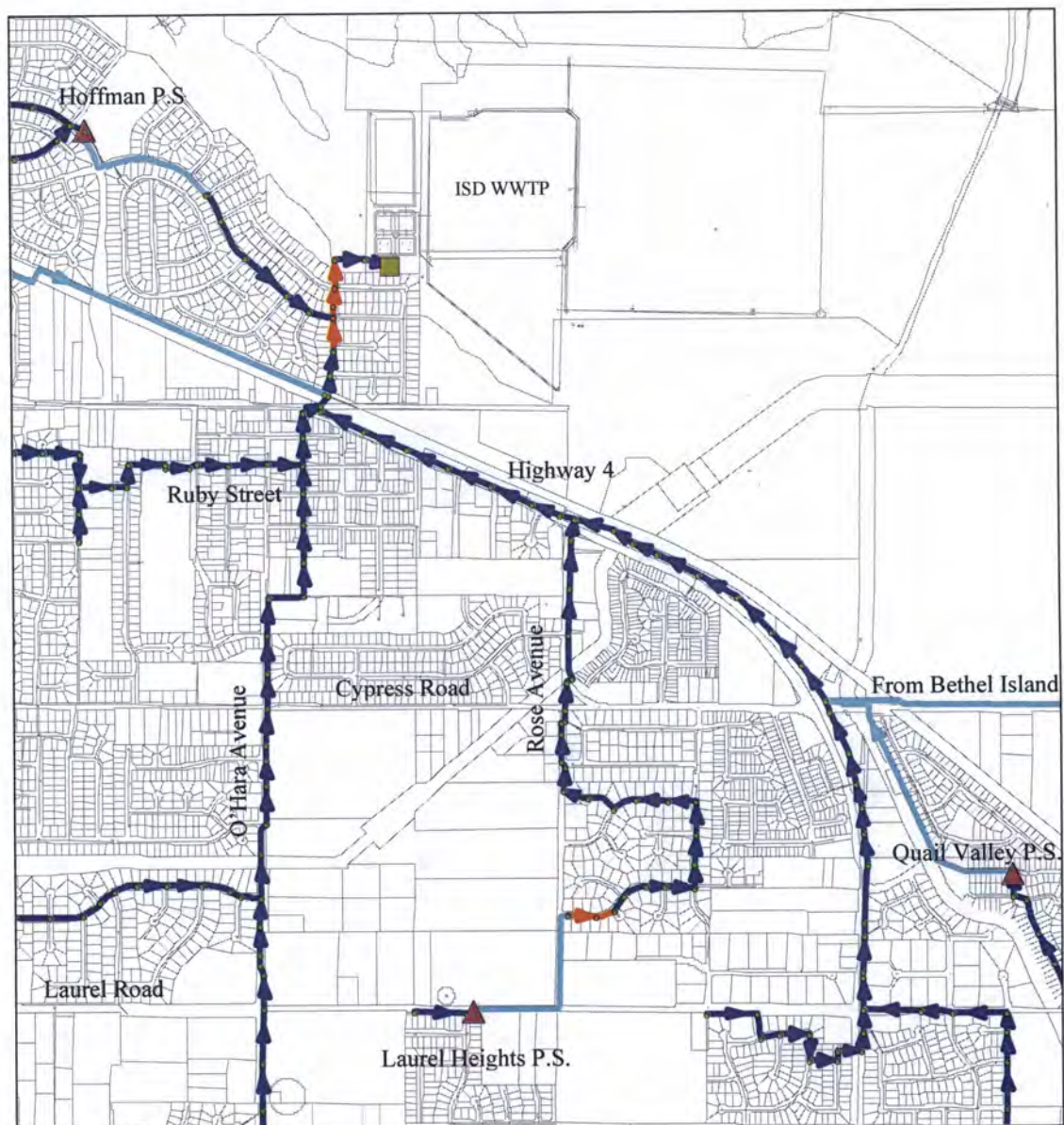
The H2OMAP Sewer model simulates design flows, water surface elevations, pipeline capacities, and other operational parameters. The model results are compared to capacity analysis criteria in order to identify capacity deficiencies. Surge was the primary parameter used to evaluate the capacity of collection system infrastructure. Within the H2OMAP Sewer model, surge occurs when a pipe exceeds a water depth over diameter (d/D) value of 1, meaning that the pipe has reached its capacity. Upstream manholes will begin to store flow until the downstream conditions permit stored flow to be bled back into the system. Current ISD standards allow design flows corresponding to a d/D value of 2/3 for pipes under 12-inches and full flow (d/D = 1) for 12-inch and larger. For this Master Plan analysis, existing pipelines will be considered sufficient if d/D values remain at or below 0.9, and new pipelines will be designed to maintain the ISD standard d/D values. ISD has decided to allow surge under design conditions in very limited circumstances. Minor surge may be accepted only when the level of surge is less than one foot and the modeled water level does not approach the manhole rim elevation.

4.1.3 Model Results

Following the development of the hydraulic model and development of deficiency (surcharge conditions) criteria, existing and future flow scenarios were investigated.

Under existing conditions with no RDI/I contribution, a condition that is analogous to average dry weather flows, several pipelines exhibited capacity deficiencies. The pipes with capacity deficiencies are shown in Figure 4-1.

Figure 4-1: Deficiencies for Existing Collection System for Average Flows (Deficiencies shown in red)



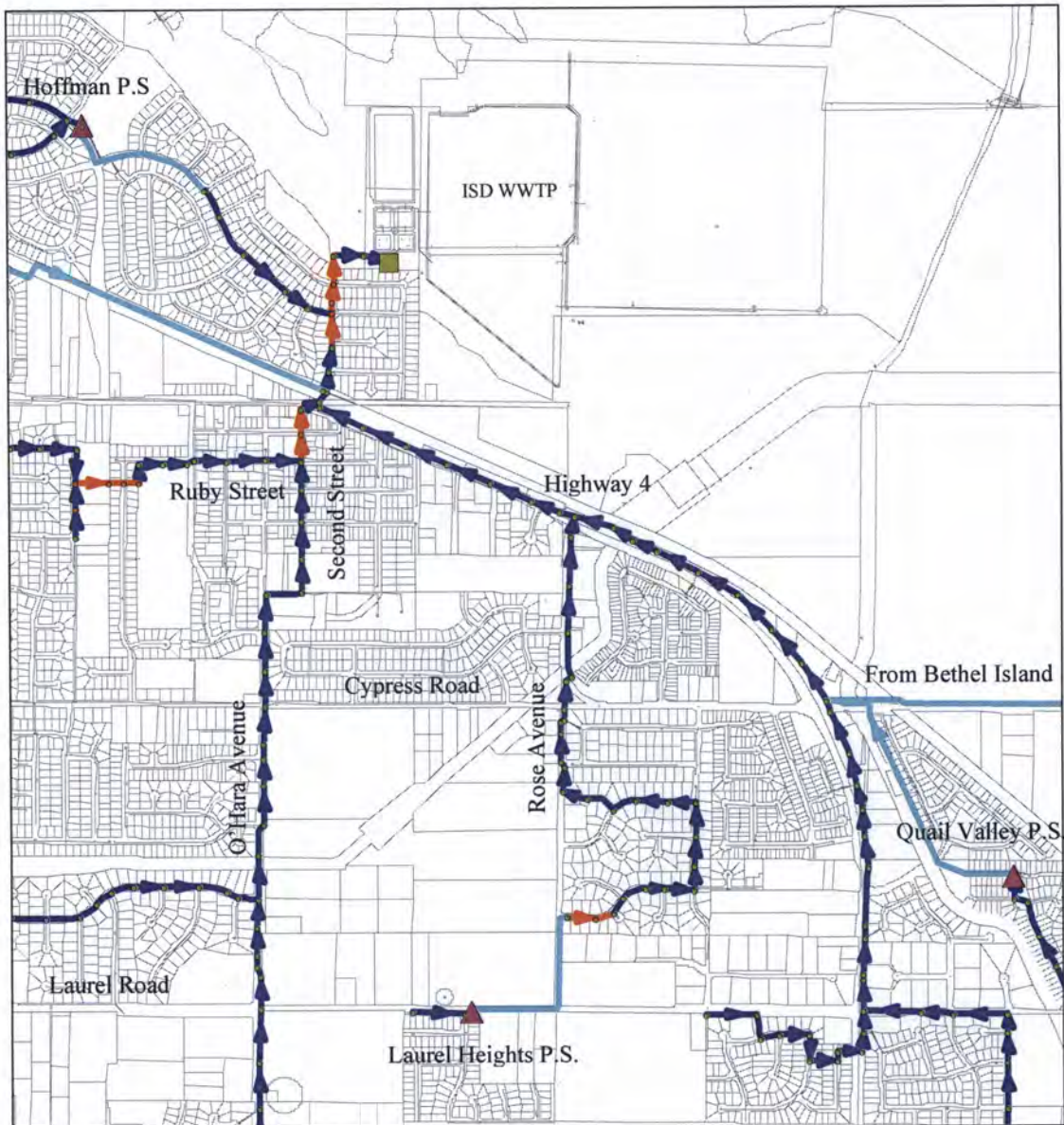
Note that there are two specific areas reporting capacity deficiencies: the large diameter pipe sections very near to the WWTP and two pipe lengths at the outlet of the Rose Avenue forcemain. Surcharging in the pipe sections near the WWTP has been witnessed by ISD staff.

The three pipe sections near the Rose Avenue forcemain discharge are 6-inch lines and exhibit substandard slopes as low as 0.001 ft/ft. These pipes were not sized to accept the concentrated flow volumes being delivered by the Laurel Heights Pumping Station and it is therefore not surprising that they surcharge. Downstream of these 6-inch pipes are 8-inch pipes that show no surcharging.

Figure 4-2 illustrates the deficiencies reported when the wet weather scenario for existing conditions was run. The deficient Ruby Street/Duarte Avenue gravity lines shown are 12-inch diameter lines with substandard slopes as low as 0.00028 ft/ft, much less than current ISD standards allow. This is the reason for the capacity limitation. Those pipes to either side of this section are the same size, 12-inch, but have slopes in line with ISD standards and are not determined to be deficient. The deficient Second Street pipe sections are 15-inch pipes sloped at ISD minimum grades. The 15-inch lines upstream from these lines show no surcharging due to significantly larger slopes.

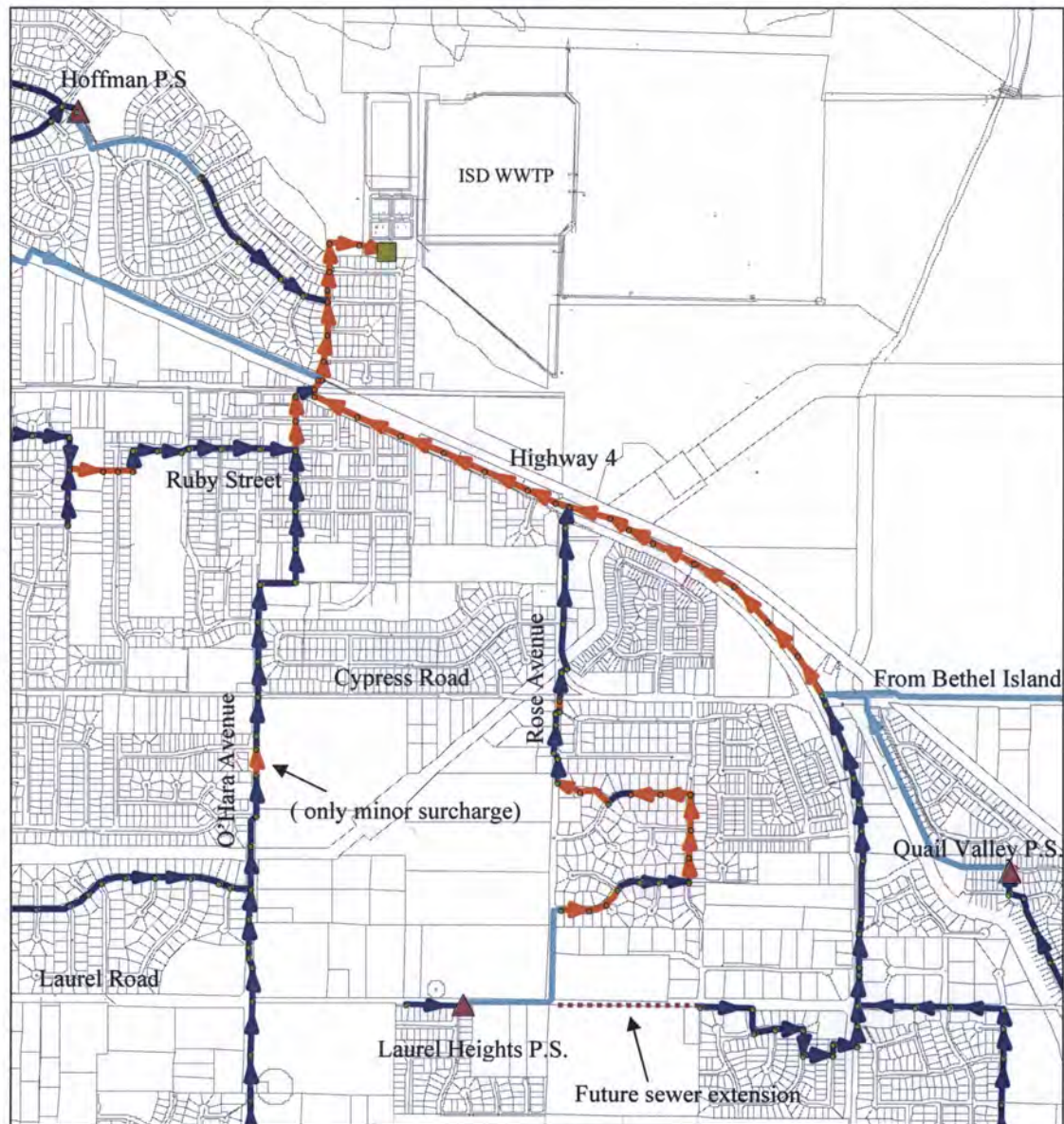
It is important to note that the condition modeled for the wet weather scenario for existing conditions represents the worst case scenario for design loading. RDI/I is near 1% of a 10-year design storm and is applied over a 6-hour time period that coincides with peak BWF loading rates. ISD may not have ever seen surcharging in these pipelines or surcharging may not actually occur. The Ruby Street pipeline serves an area that has been largely built-out, and future developments in the tributary area will be minimized. The Second Street pipeline will be expected to serve a much larger future development within the City of Oakley, and will certainly require relief to serve these future developments.

Figure 4-2: Deficiencies for Existing Collection System for Wet Weather Flows (Deficiencies shown in red)



Figures 4-3 and 4-4 illustrate the behavior of the system under future wet weather loading (buildout) conditions. As shown in Figure 4-3, in addition to the deficiencies encountered under existing flow scenarios, future flow scenarios predict sewer surcharging in a single, low slope reach of the O'Hara Avenue trunk sewer, low slope regions of the 8-inch and 12-inch Rose Avenue gravity system, and the entire 18-inch Highway 4 trunk sewer after its junction with the Cypress Lakes/Bethel Island forcemain.

Figure 4-3: Deficiencies the Existing System Model for Future Wet Weather Flows (Deficiencies shown in red)

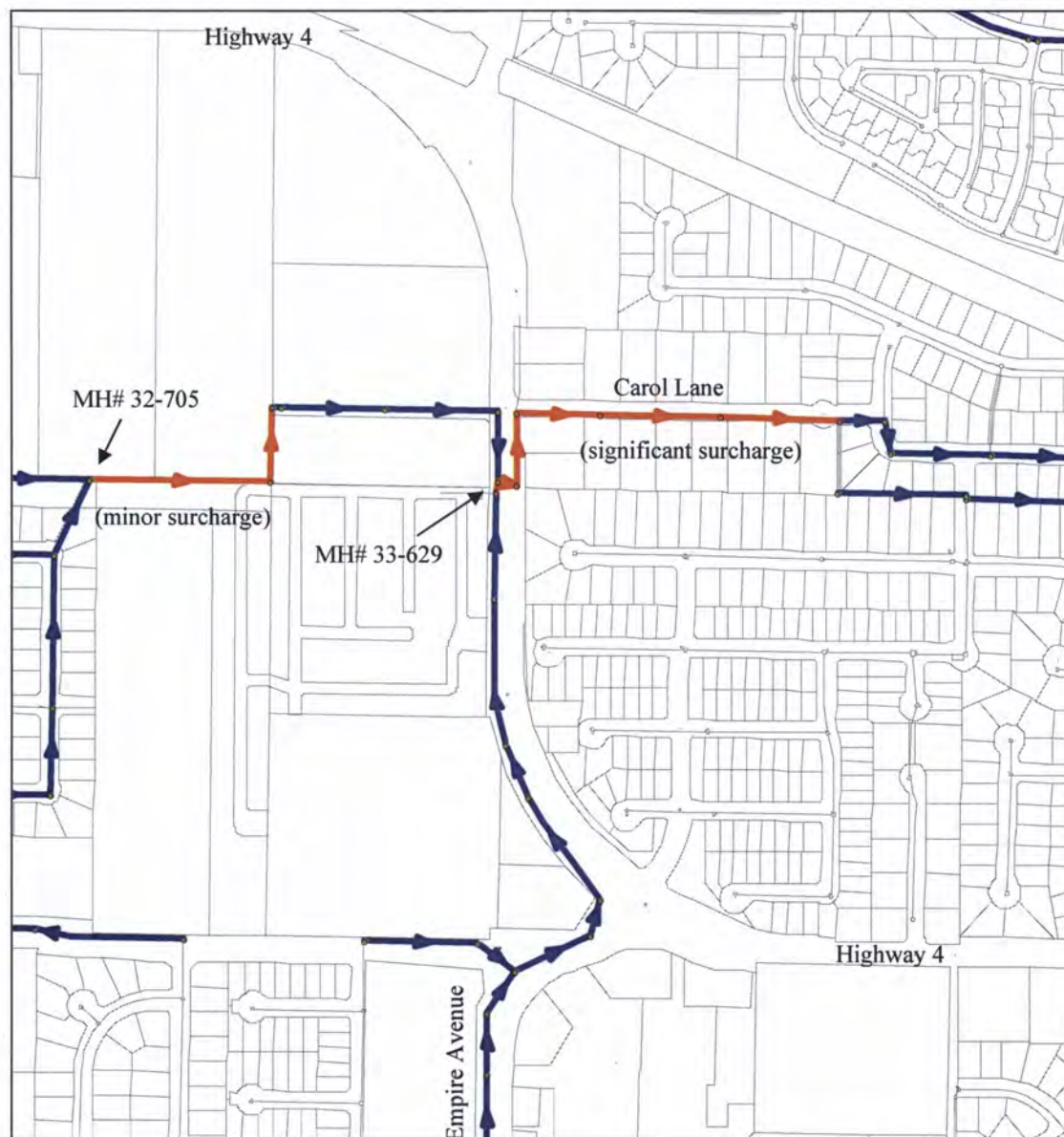


The level of surcharge in the O'Hara Avenue sewer section, which is located between manholes 44-503 and 44-502, is minor (less than 1 foot), and is not considered significant enough to require an improvement given the sewer's depth. The Rose Avenue surcharging is significant, however it can be mitigated by way of a planned improvement. The Laurel Heights pump station was intended to be a temporary facility, an interim solution to serve a single subdivision. The ultimate system configuration will eliminate the Laurel Heights Pumping Station and extend its influent sewer to the existing sewer in Laurel Road, some 2,100 feet to the east. This project, however, will become a condition

of development for the developer that ultimately triggers the need for increased capacity. As such, ISD will not include this pipeline in its Capital Improvement Program.

Figure 4-4 illustrates the areas of the 18-inch sewer near Carol Lane that are predicted to experience surcharging under design conditions. The areas downstream of manhole 32-705 do not experience significant surcharging relative to the sewer depth. However, the 18-inch sewer downstream of manhole 33-629 has very little depth of cover and is a significant concern.

Figure 4-4: Deficiencies the Existing System Model for Future Wet Weather Flows (continued)



4.1.3 Model Results (Pumping Deficiencies)

Four pumping stations are expected to require capacity upgrades (pump changes, impeller changes, etc.) in the future:

- Ironwood Pumping Station
- Quail Valley Pumping Station
- Marsh Creek Pumping Station
- WEB-14 Pumping Station

Flow requirements for these pump stations are included in Chapter 5.

4.1.4 Bethel Island

Because planning information for Bethel Island is limited, it is not possible to know which existing lines will convey a particular portion of the Island's ultimate flow to the Bethel Island Main Pumping Station. Therefore, it is not possible to accurately predict which lines will require relief. It is known that the two existing pipes entering the Main Pumping Station are sized and sloped to convey a maximum flow of 1.71 mgd. This value is above the average flows projected for Bethel Island, but may be exceeded under future dry or wet weather conditions.

Pipelines on Bethel Island may require relief under certain development conditions. These improvements will be a condition of development. The impact of future developments on the capacity of the sewer collection system will be assessed on a case-by-case basis. If it is determined that a particular development will generate wastewater flows in excess of the remaining sewer collection system capacity, the developer will be responsible for all necessary collection system improvements to meet capacity requirements. As it is not anticipated that any ISD funding will be required to complete these projects, they do not appear in the recommended CIP outlined in Chapter 5.

4.1.5 East Cypress Corridor

The East Cypress Corridor proposes development on 2,546 acres. The proposed developments allows up to:

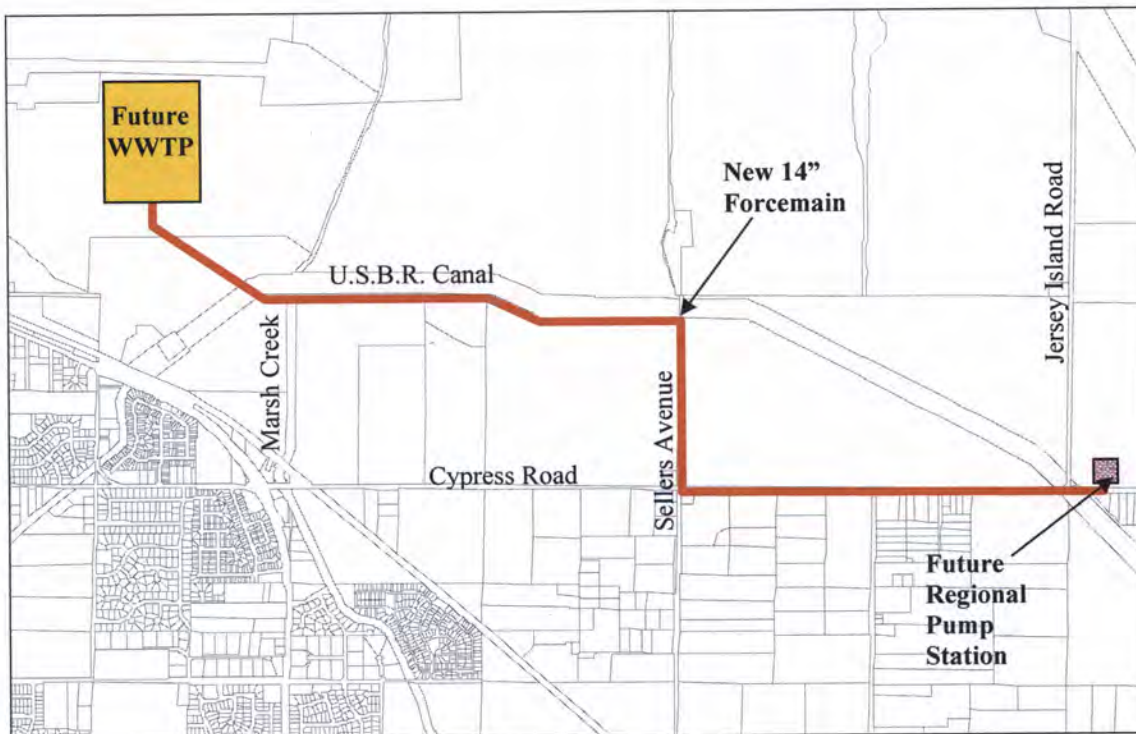
- 5,609 residential units
- 92.6 acres of commercial use
- 52.6 acres of public schools
- 152.3 acres of man-made lake
- 190 acres of open space/easement
- 20.5 acres of flood-control levees
- 101.7 acres of parks

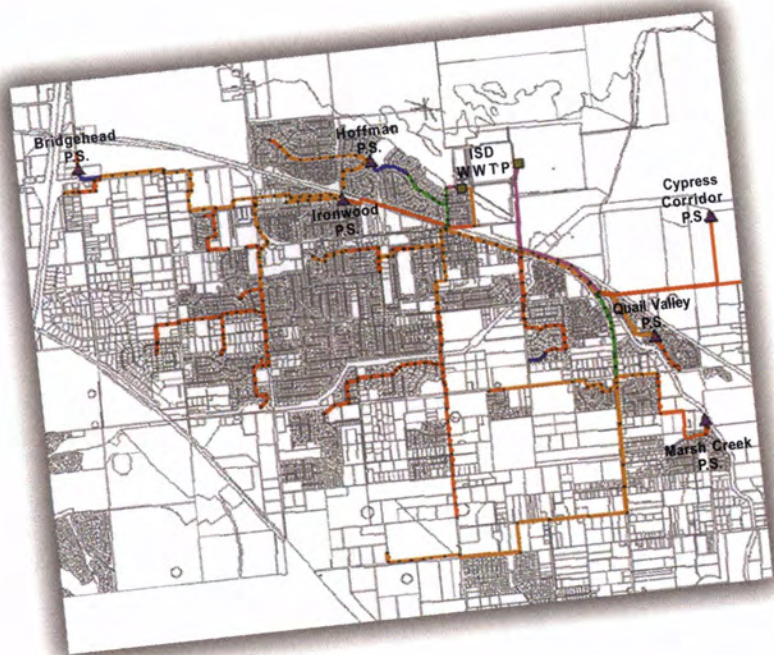
- 5.7 acres of light industrial use
- 37.3 acres of commercial recreation
- 6 acres for a beach club

Flow from the proposed East Cypress Corridor is estimated at 1.85 mgd average dry weather flow and 3.70 mgd peak wet weather flow. These flows combined with projected flows from areas currently served by ISD result in flows of 3.23 mgd average dry weather flow and 6.46 mgd peak wet weather flow that would enter the existing 14-inch forcemain. The existing 14-inch forcemain conveys sewer flows to an 18-inch gravity sewer main at the intersection of East Cypress Road and State Route 4. The 18-inch gravity main then conveys flows northeast to the existing treatment plant.

The existing 14-inch forcemain is inadequate to handle the proposed peak flow of 6.46 mgd from the East Cypress Corridor as velocities in the forcemain will exceed 8 feet per second. To provide redundancy and keep velocities to an acceptable level a second 14-inch forcemain is recommended. Figure 4-5 presents the proposed routing of the proposed 14-inch forcemain.

Figure 4-5: Routing of Proposed 14-inch Forcemain





CHAPTER 5

Capital Improvement Program

CHAPTER 5

CAPITAL IMPROVEMENT PROGRAM

5.1 Design Criteria

The following criteria were used to develop the sanitary sewer and pump station improvement project alternatives to correct potential wet-weather conveyance deficiencies identified in Chapter 4 and provide service to future developments.

Additional pipeline capacity, as calculated in H2OMAP Sewer, may be added to the system by installing parallel relief sewer lines to carry a portion of the estimated flow or by installing replacement pipe sections to carry the entire estimated flow. In order to identify the required improvements, the following assumptions were made:

- Pipes that had a design flow to design capacity (or design d/D) of 1 were included in the Capital Improvement Program (CIP)
- Recommended pipe sizes were based on the ultimate (build-out) flow levels using a maximum allowable percent full of 90 percent for pipelines. No pipeline under 12-inches was included in the CIP; pipelines under 12-inches are not eligible for ISD funding.
- Replacement pipes were preferred over parallel pipes because 1) the difference in the parallel and replacement pipe was generally only one or two diameters; 2) long-term maintenance is more efficient with fewer pipes and manholes in the system; and 3) underground utility congestion is minimized with fewer pipes.
- In general, short reaches of non-deficient pipe located between pipes that are deficient were included in the cost estimates to avoid downsizing of pipes in the direction of flow.
- ISD staff input and preferences would guide selection of alternatives.

5.2 Cost Estimation Criteria and Allocation

Cost Estimates were adjusted using the Engineering News Record (ENR) construction cost index (CCI). The ENR CCI is the primary index utilized by the engineering community to adjust cost estimates developed in different years, although other indices such as Means CCI are sometimes used. Cost estimates are keyed to a July 2003 ENR CCI for San Francisco of 6695.

The implementation of all of the CIP projects included in this section will be timed to accept flows from future developments as they occur. All deficient pipelines have been assigned a capacity remaining value to aide ISD in determining when these projects will become necessary. Therefore, all costs are stated in July 2003 dollars and have not been carried forward to a specific implementation year. Prior to design and construction of these improvements, these costs should be reevaluated as necessary to reflect current construction and ENR CCI index trends.

5.2.1 Sanitary Sewer Pipeline Costs

Open-Cut Costs – Sanitary sewer installation costs vary according to several factors including pipe materials, depth and complexity of construction, traffic control street repair, etc. Preliminary cost estimate for sewer line material and construction are based on bids received for pipeline construction projects in the Bay Area and other master plans. The costs for the 6- to 27-inch diameter pipelines averaged between \$9 and \$19 per lineal foot per inch of diameter for different pipe materials. An average cost of \$12 per lineal foot per inch of diameter was used for sewer line cost estimation for projects that are greater than 1,000 feet in length. For sewer lines that are less than 1,000 feet, an extra 10% was added to the cost to account for the higher relative mobilization costs for the short pipe reaches. These costs include pipe material and installation, manholes, excavation and backfill, pavement removal and replacement, allowances for limited sheeting, dewatering and shoring, mobilization and contractor's overhead and profit. The prices exclude any contingencies.

Trenchless Technology Costs – Any trenchless technology method used for pipeline construction will depend on the results of the geotechnical investigation done in the design phase of the project. Therefore, costs used are average costs of different methods such as microtunneling, jack and bore, directional boring, etc. The average cost used is \$40 per lineal foot per inch of diameter of pipe. These costs include pipe material and installation, boring pits, excavation and backfill, allowances for limited sheeting, dewatering and shoring, mobilization and contractor's overhead and profit. The prices exclude any contingencies.

5.2.2 Property Easements and Right of Way Costs

All projects occur on public property or on ISD property. Land acquisition and right of way (ROW) costs are not anticipated.

5.2.3 Construction Contingency and Project Implementation Multiplier

Two categories of costs were added for each project: a construction contingency and a project implementation multiplier.

A construction contingency of 30% was applied to the initial estimate of project construction costs to determine the total construction cost estimate. A construction contingency is necessary due to unforeseen construction costs that cannot be anticipated with a master planning-level review. The construction contingency is added to compensate for the planning-level estimation.

The project implementation multiplier was added at a rate of 30% of the total construction estimate. The project implementation factor includes:

- Administrative costs;
- Environmental assessments and permit;
- Planning and engineering design; and
- Construction administration and management.

The percentages are considered to be appropriate for master planning-level estimates. Prior to design and construction of recommended improvements, these costs should be reevaluated as necessary to reflect current construction and ENR CCI index trends.

5.3 Description of Proposed Improvement Projects

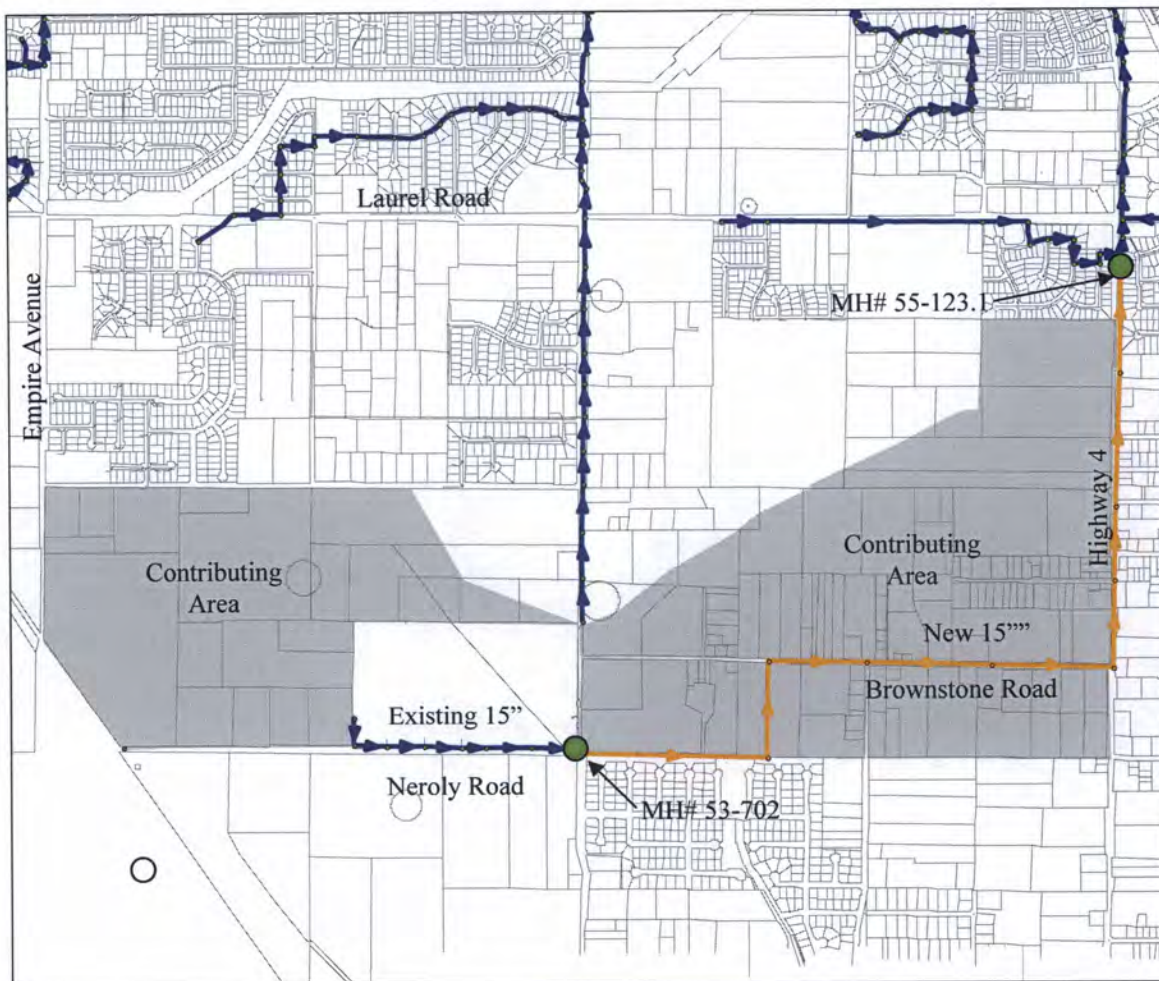
This section identifies the recommended improvement projects needed to mitigate the defined deficiencies and describes project location, proposed pipe sizes and estimated project costs. There are two types of improvement projects outlined in the section: projects intended to bring trunk sewer service to undeveloped areas and projects intend to mitigate capacity deficiencies in the existing collection system. Only pipelines 12-inches and larger have been included in the proposed CIP.

5.3.1.1 Neroly Road/Brownstone Road/Highway 4

This project will serve southern Oakley with an extension of the existing 15-inch trunk line from Highway 4. The line will eliminate the need for the temporary Freedom High School Pumping Station. The pipeline includes 4,050 feet of pipeline in Highway 4 and 6,200 feet of pipeline between O'Hara Avenue and Highway. The majority of the service area is residential with small areas of projected commercial developments. The proposed improvements are shown in Figure 5-1.

The estimated project cost is \$3,118,000.

Figure 5-1 Neroly Road/Brownstone Road/Highway 4 Project

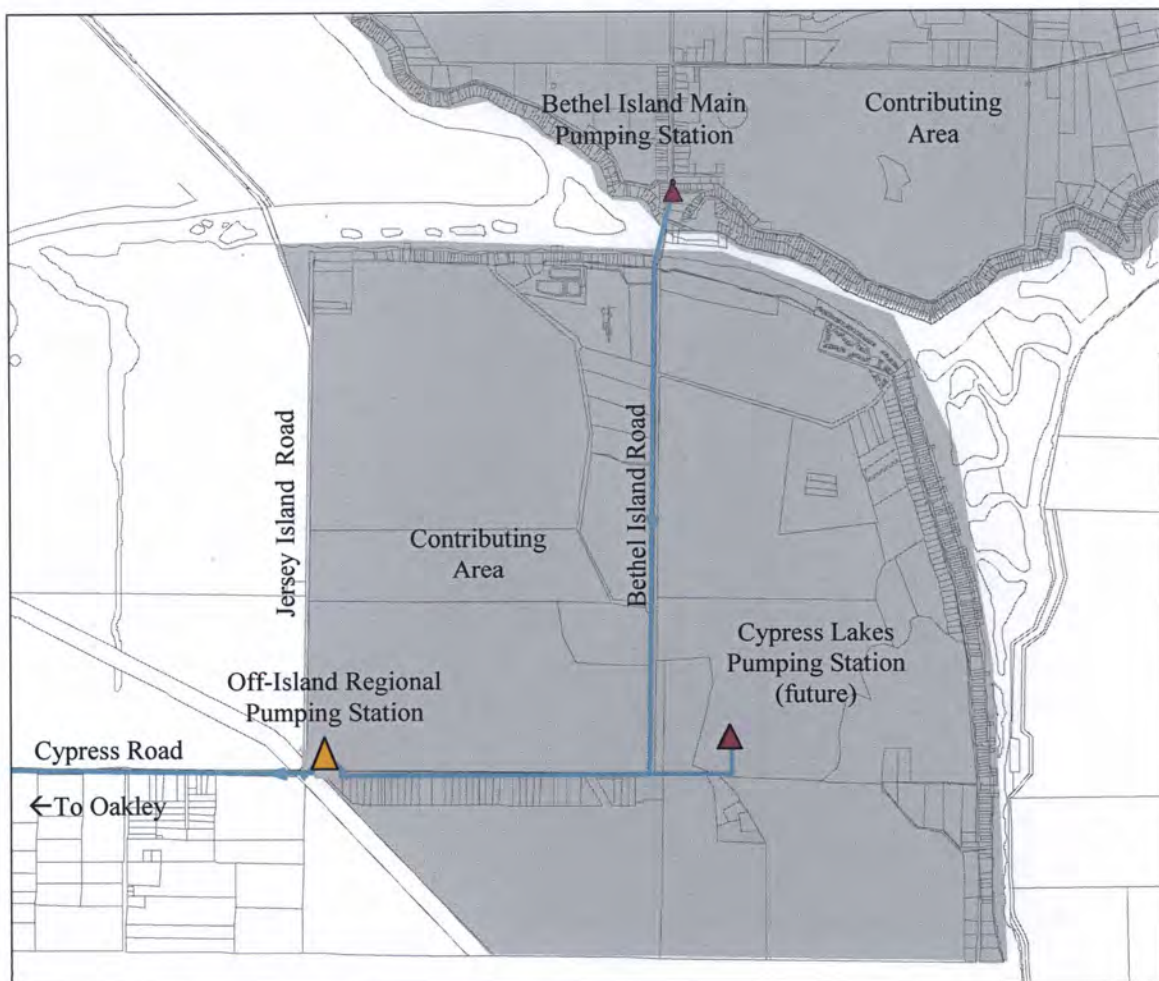


5.3.1.2 Off-Island Regional Pumping Station

The Off-Island Regional Pumping Station is proposed to be located at the intersection of Jersey Island Road and Cypress Road. The station will receive all flow from Bethel Island and mainland regions east of Jersey Island Road, including the future Cypress Lakes development. The station is expected to receive a peak wet weather flow of 7.4 mgd. The Off-Island Regional Pumping Station will pump flows through the existing 14-inch forcemain west along Cypress Road to the City of Oakley. Though the exact location of the pumping station is not yet known, minimal pipeline is expected to be required to tie the station into the existing 14-inch forcemain. The station location is shown in Figure 5-2.

The estimated project cost is \$1,373,000.

Figure 5-2: Off-Island Regional Pumping Station

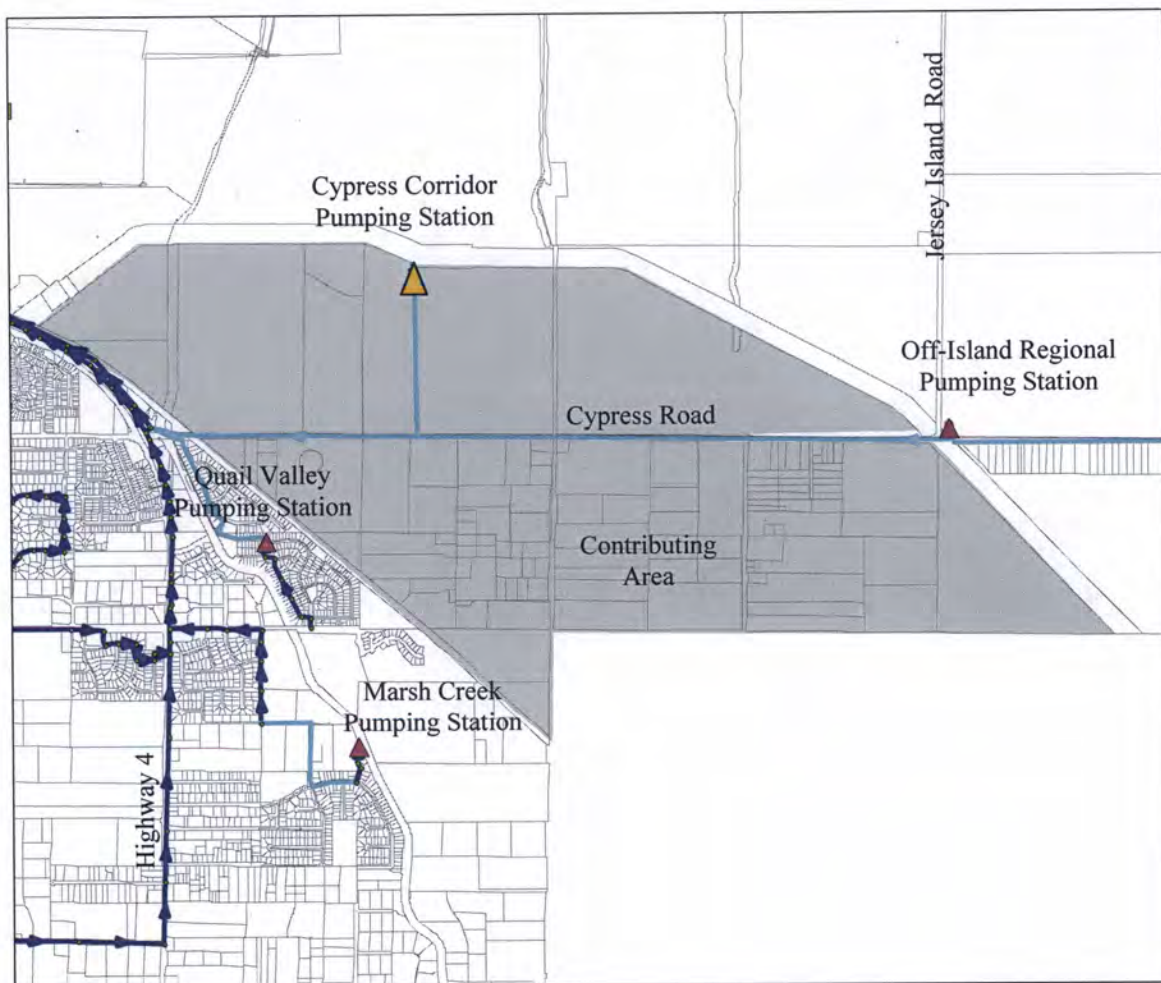


5.3.1.3 Cypress Corridor Pumping Station

The Cypress Corridor Pumping Station will be a regional pumping station serving the area shown in Figure 5-3. It is expected to receive a peak wet weather flow of 2.3 mgd and will discharge directly into the Cypress Road 14-inch forcemain. A 2,200-foot, 12-inch forcemain is also included in the cost estimate to connect the pumping station to the existing forcemain.

The estimated project cost is \$1,137,000.

Figure 5-3 The Cypress Corridor Pumping Station



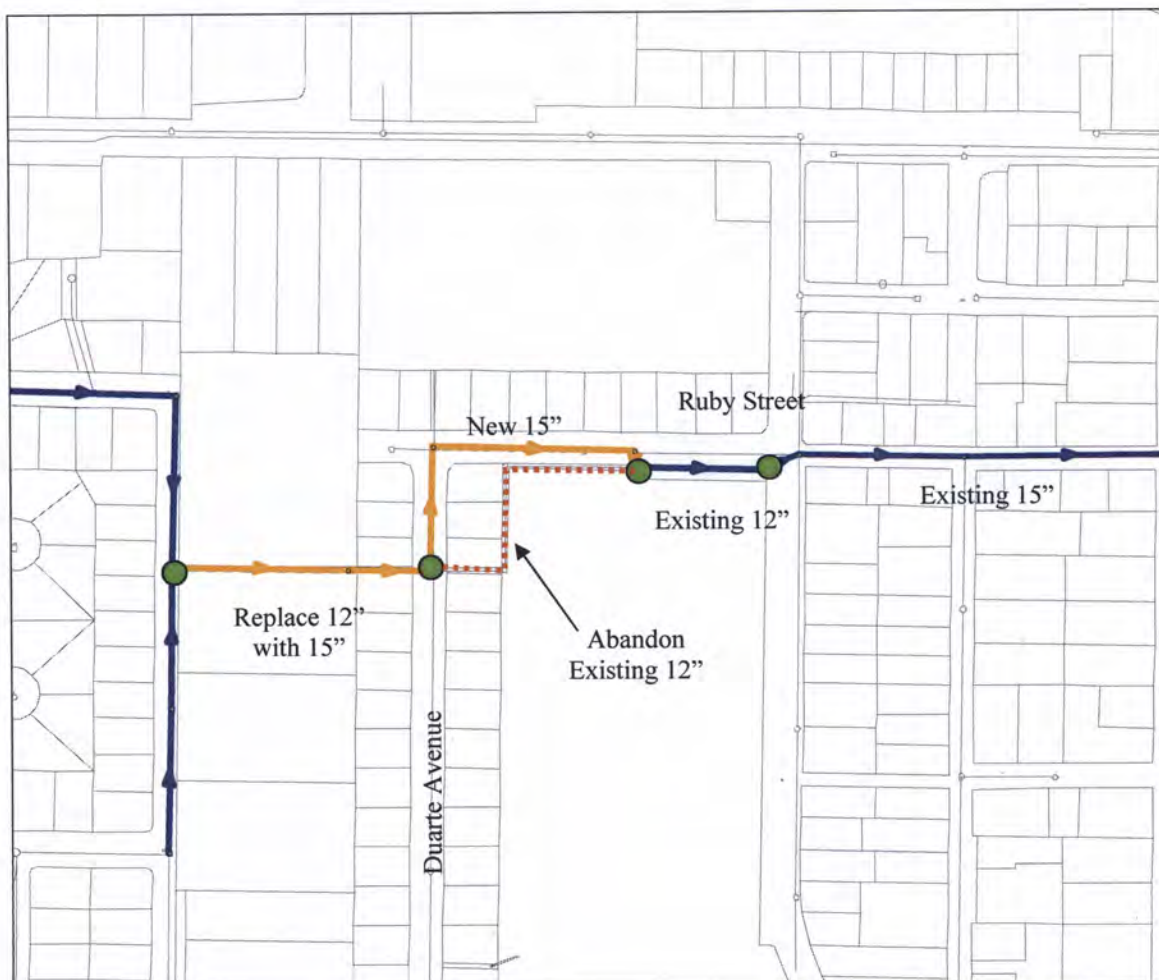
5.3.2 Projects to Correct Capacity Deficiencies

5.3.2.1 Ruby Street/Duarte Avenue

Deficiencies in the 12-inch Ruby Street / Duarte Avenue sewer were predicted under wet weather conditions at current development levels, indicating that this section of pipe requires immediate relief to handle design wet weather flows. In this case, the section of pipe in question is placed within a sanitary sewer easement running through residential parcels and has been placed at a sub-standard slope. It is not necessary to replace the 12-inch pipe downstream of the problem section as they are sloped sufficiently to maintain d/D values of 0.8 or below. The improvements are shown in Figure 5-4. The new sewer will be realigned to run north in Duarte Avenue and the east in Ruby Street. A total of 1,000 feet of pipe is to be replaced.

The estimated project cost is \$304,000.

Figure 5-4 Ruby Street /Duarte Avenue Project

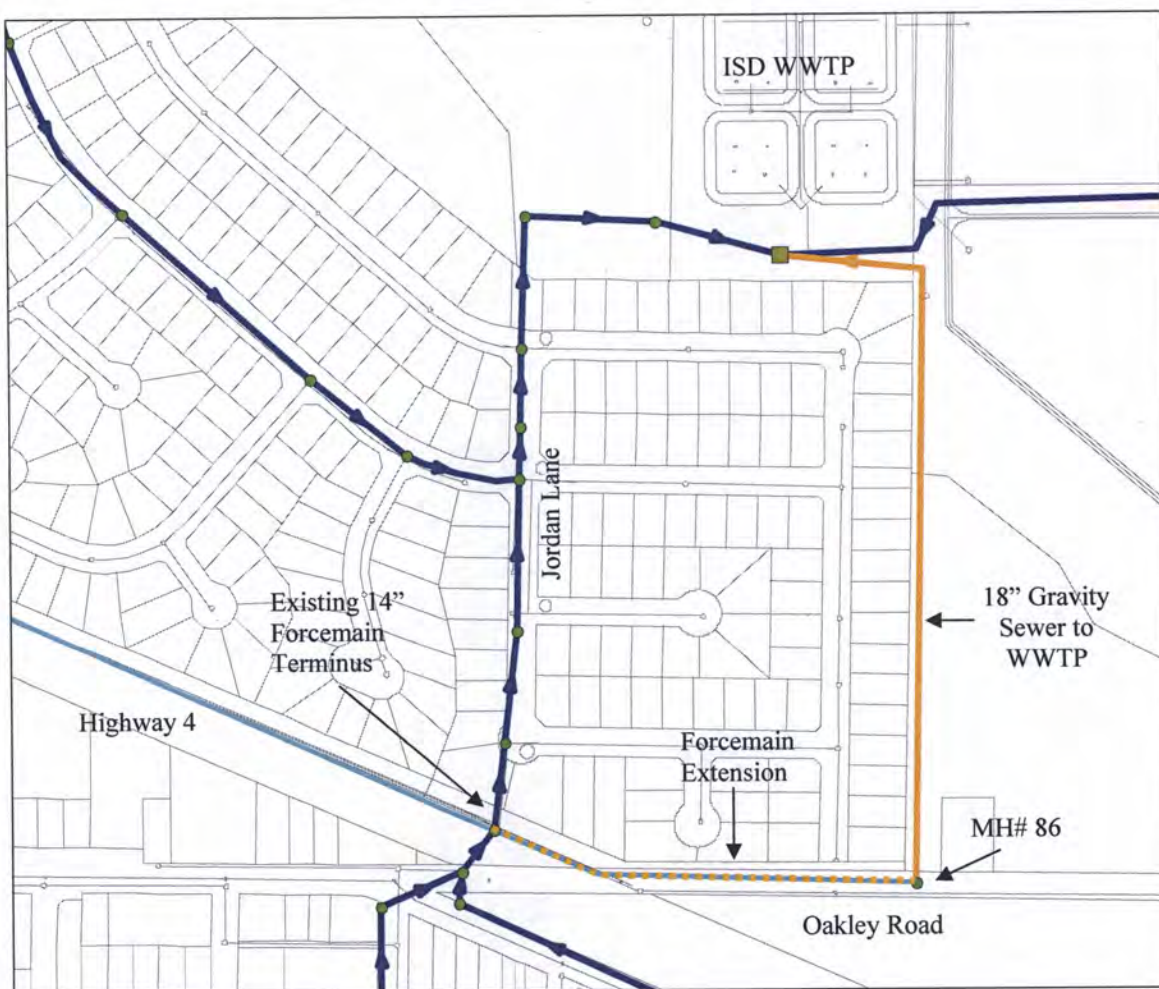


5.3.2.2 Ironwood Forcemain Extension and Gravity Sewer

Rerouting flows from Ironwood Pumping Station via a forcemain extension and gravity sewer will mitigate the surcharging predicted in the Jordan Lane trunk sewer. Currently, the Ironwood Pumping Station forcemain discharges directly into the Jordan Lane trunk sewer. This concentrated flow results in surcharging downstream. Under the proposed project, an 850-foot, 14-inch diameter forcemain extension would be routed east along Oakley Road, where it will discharge into a 1,500-foot gravity sewer. The proposed project is illustrate in Figure 5-5.

The estimated project cost is \$813,000.

Figure 5-5 Ironwood Forcemain Extension and Gravity Sewer

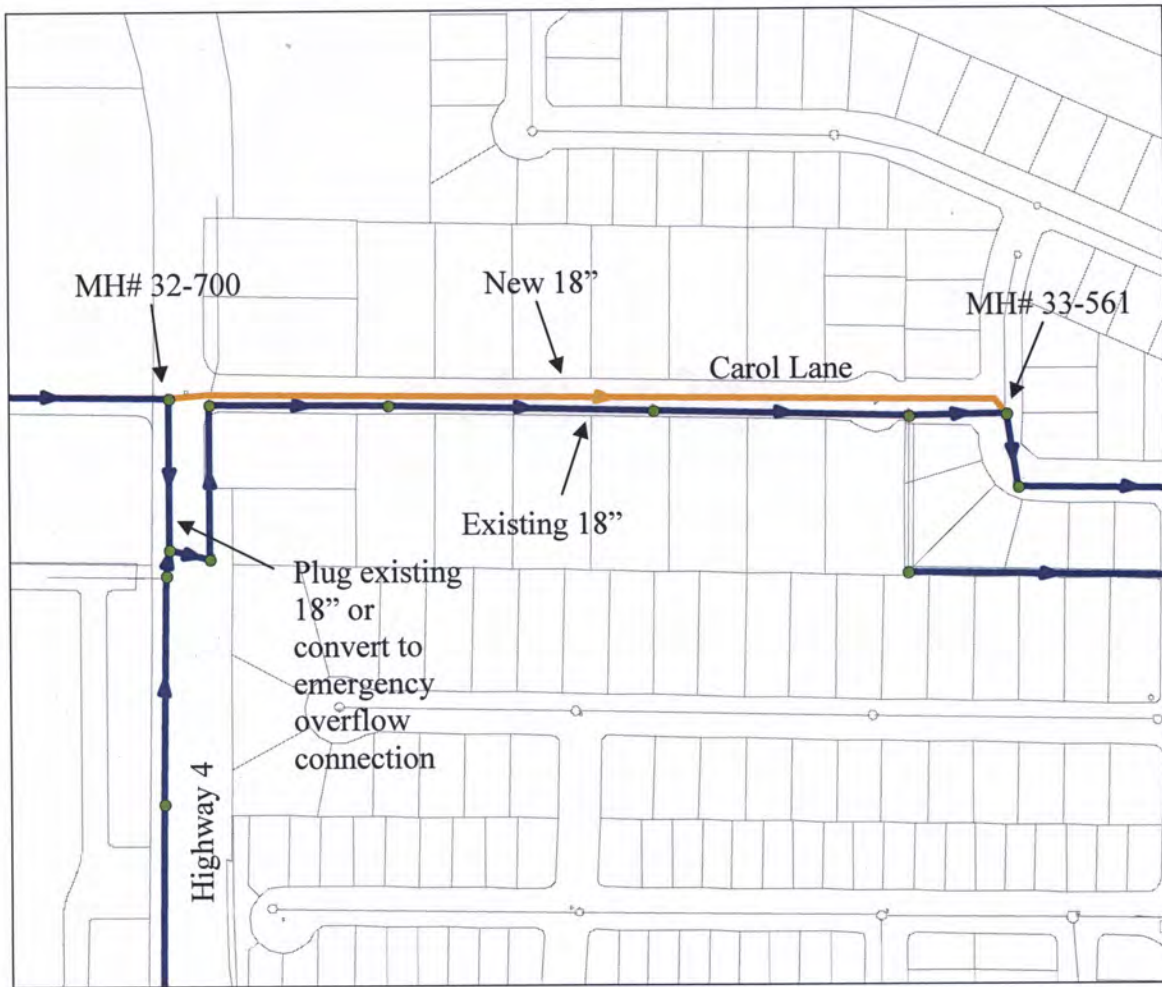


5.3.2.3 Carol Lane Relief Sewer

The 18-inch sewer in Carol Lane is predicted to surcharge under design conditions. This pipeline is of particular concern due to the shallow depth of cover over the sewers. A relief sewer is proposed as illustrated in Figure 5-6. The proposed 1,120-foot, 18-inch relief sewer would extend from the existing manhole 32-700 across Highway 4 and east along Carol Lane. The relief sewer would tie back into the collection system at manhole 33-561. The slope of the existing 18-inch sewer downstream of manhole 33-561 is significantly higher than that in Carol Lane, and is not predicted to pose a problem with respect to surcharging. As shown in Figure 5-6, the relief sewer would convey all flow passing through the existing 18-inch sewer west of Highway 4. The existing sewer length south of manhole 32-700 would be plugged. The existing 18-inch sewer in Carol Lane would thereby be dedicated to conveying flows from south. If desired, ISD may elect not to plug the 18-inch connection south of manhole 32-700, but use it instead as an emergency overflow connection between the two 18-inch sewers.

The estimated project cost is \$409,000.

Figure 5-6 Carol Lane Relief Sewer

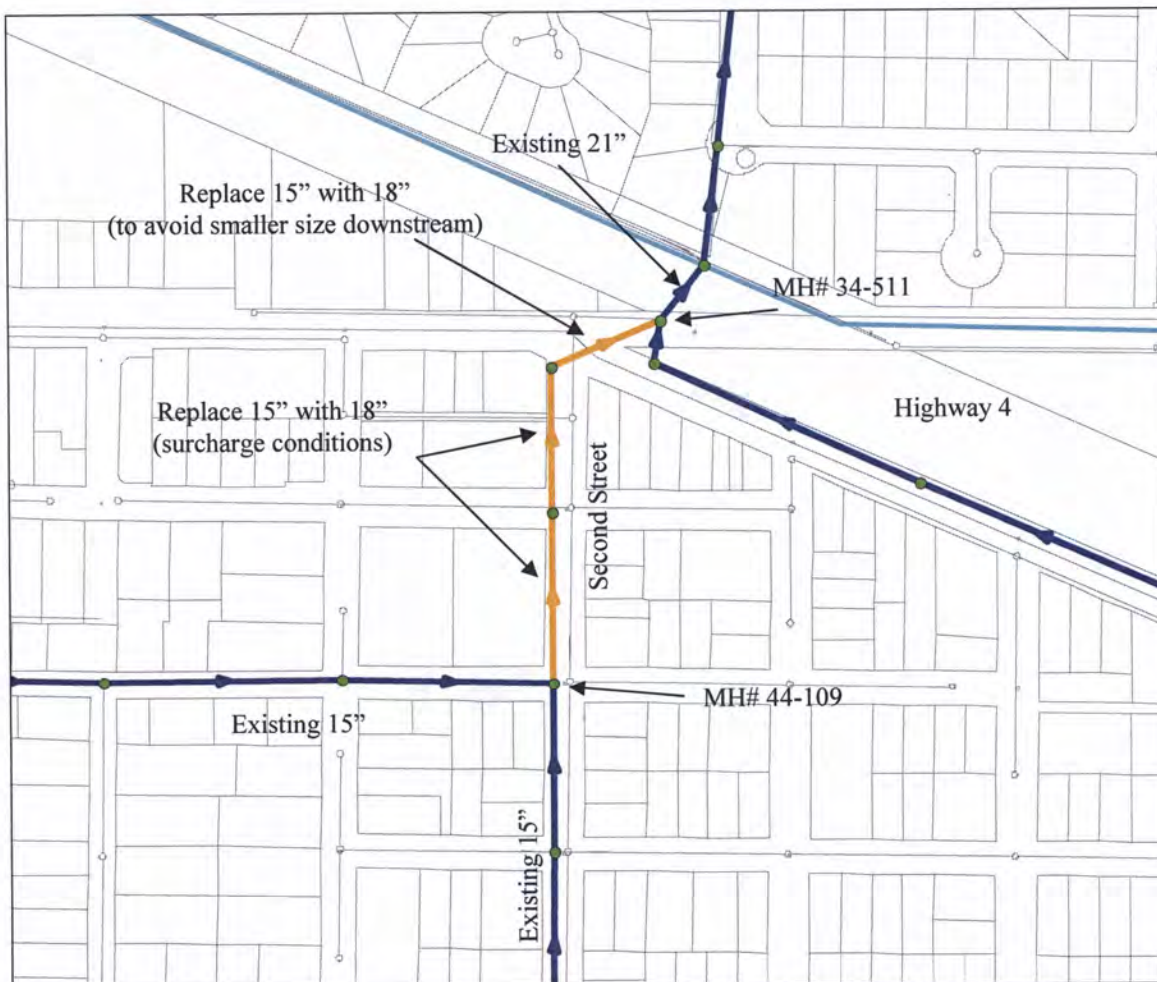


5.3.2.4 Second Street

The Second Street 15-inch exhibited surcharge under design existing wet weather flow conditions, indicating an immediate need for relief. In the future, these pipes will convey significantly more flow than they do under existing conditions. Two sections of 15-inch sewer exhibited capacity problems; a third section is included in the project to eliminate a smaller sewer downstream of the improvement. The improvements are shown in Figure 5-7. The total replacement length is 640 feet.

The estimated project cost is \$257,000.

Figure 5-7 Second Street Project



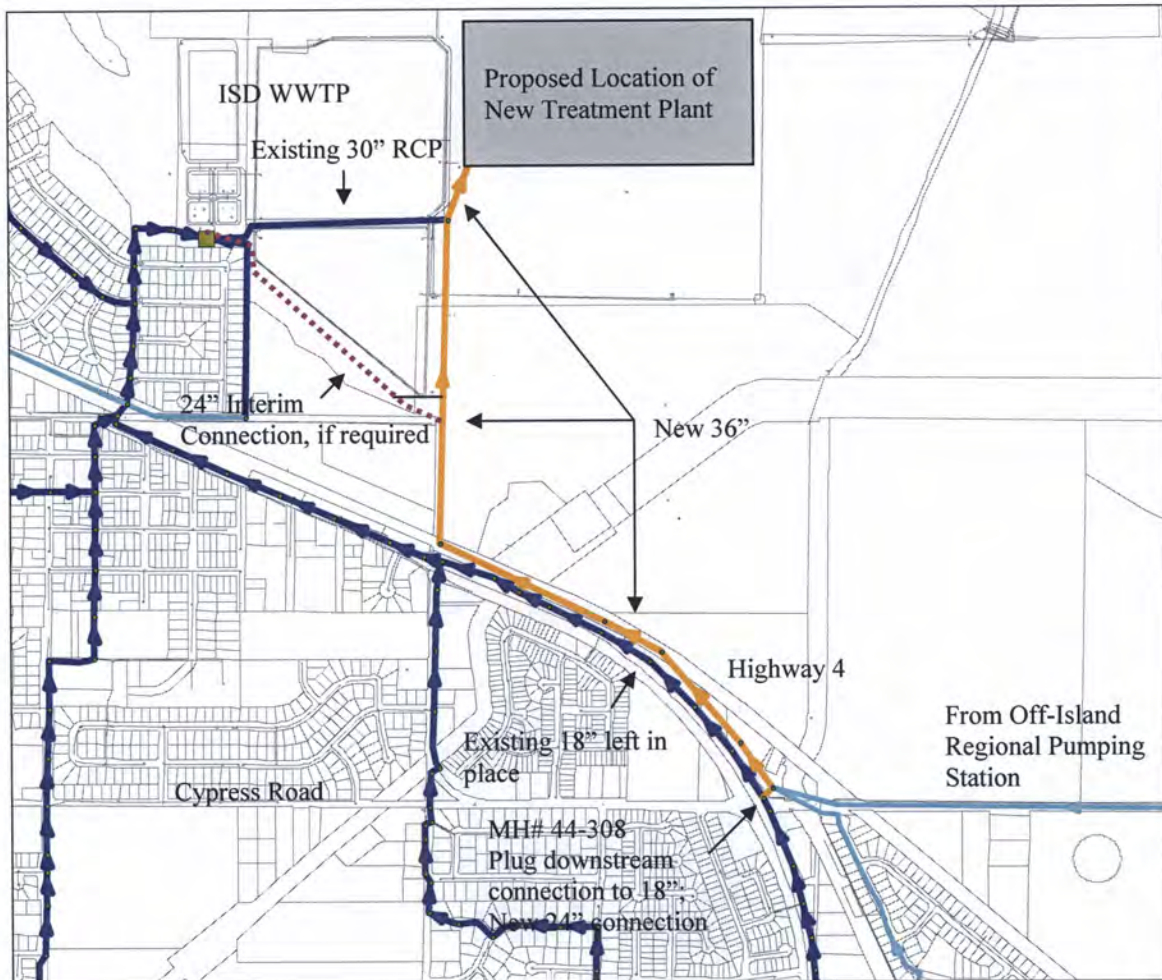
5.3.2.5 Highway 4

This project will relieve capacity problems in the 18-inch Highway 4 pipeline. The proposed improvements are shown in Figure 5-8. A new 36-inch trunk sewer would be installed to carry flow pumped from the Cypress Lakes, Cypress Corridor and Quail Valley Pumping Stations as well as to intercept flow from the existing 24-inch trunk sewer south of Cypress Road in Highway 4. The existing 18-inch sewer between the connection point and Rose Avenue would be left in place in to serve unexpected future capacity needs and will convey flow from one existing connection point. The existing 18-inch west of Rose Avenue would remain in service and is projected to experience no capacity issues. It is projected that the 18-inch line in Highway 4 currently has 280 gpm of capacity remaining, roughly the equivalent of 800 single-family units. Analysis indicates that the surcharge observed in the 18-inch sewer once this capacity is exceeded will be mild, particularly with respect to the sewer's depth. It is not anticipated that surcharging will reach significant levels for some time. However, should the capacity be reached prior to completion of new ISD treatment facilities, an interim pipeline (24-inches) may be routed to carry initial flows from the 36-inch line to the existing facilities. The sizing of the 24-inch line assumed one-third of the ultimate wet weather flows are being delivered from Cypress Lakes Pumping Station and Cypress Corridor Pumping Station. Alternatively, an existing 30-inch reinforced concrete pipe runs between ISD's two storage ponds and could be used to connect the 36-inch sewer to the existing treatment plant. However, further investigation is required to assess the potential to use this pipe as an interim connection.

The estimated cost of the 6,970-foot relief sewer is \$5,089,000.

The estimated cost of the 24-inch interim connection to the existing treatment facilities is \$1,134,000.

Figure 5-8 Highway 4 Project



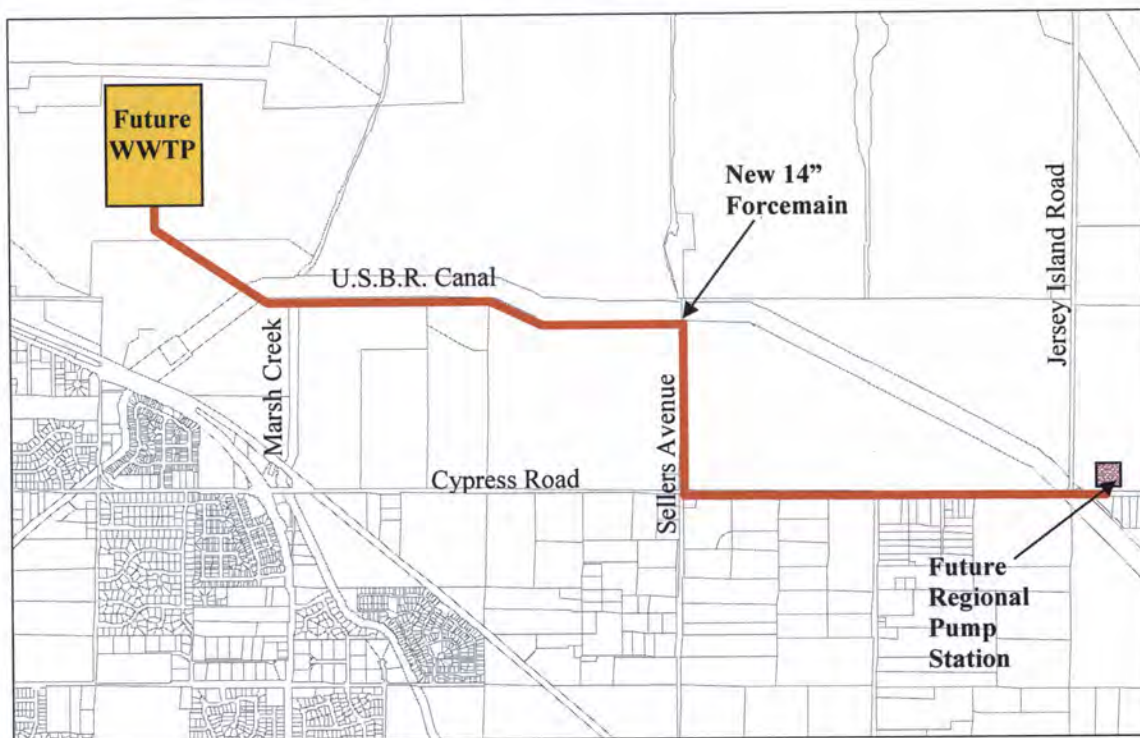
5.3.2.6 East Cypress Corridor

Flow from the proposed East Cypress Corridor is estimated at 1.85 mgd average dry weather flow and 3.70 mgd peak wet weather flow. These flows combined with projected flows from areas currently served by ISD result in flows of 3.23 mgd average dry weather flow and 6.46 mgd peak wet weather flow that would enter the existing 14-inch forcemain. The existing 14-inch forcemain conveys sewer flows to an 18-inch gravity sewer main at the intersection of East Cypress Road and State Route 4. The 18-inch gravity main then conveys flows northeast to the existing treatment plant.

The existing 14-inch forcemain is inadequate to handle the proposed peak flow of 6.46 mgd from the East Cypress Corridor as velocities in the forcemain will exceed 8 feet per second. To provide redundancy and keep velocities to an acceptable level a second 14-inch forcemain is recommended. Figure 5-9 presents the proposed routing of the proposed 14-inch forcemain.

The estimated project cost for the proposed 14-inch forcemain is \$3,000,000.

Figure 5-9: Routing of Proposed 14-inch Forcemain



5.3.2.7 Pumping Station Capacities

Table 5-1 indicates the projected peak flows into these pumping stations. These values represent the ultimate conditions at these stations; interim capacity requirements may be significantly lower. These are the pumping capacities that have been assigned within the H2OMAP Sewer model.

Table 5-1 Future Pumping Station Flows (gpm)

Pumping Station	Peak Dry Weather Flow	Peak Wet Weather Flow
Hoffman P.S.	325	385
Ironwood P.S.	1,510	1,990
Freedom High P.S.	Eliminated	Eliminated
Quail Valley P.S.	350	450
Laurel Heights P.S.	Eliminated	Eliminated
Bridgehead P.S.	40	45
Bethel Island Main P.S. and WEB-14 (combined)	1,340	2,130
Marsh Creek P.S.	350	450
Off-Island Regional Pump Station ¹	4,490	5,150
Cypress Corridor P.S.	1,300	1,600

¹ Assumes that Bethel Island Main Pumping Station is pumping at Peak Wet Weather Flow rate.

Of the existing pumping stations, four are expected to require capacity increases over time:

- Ironwood Pumping Station
- Quail Valley Pumping Station
- Marsh Creek Pumping Station
- WEB-14 Pumping Station

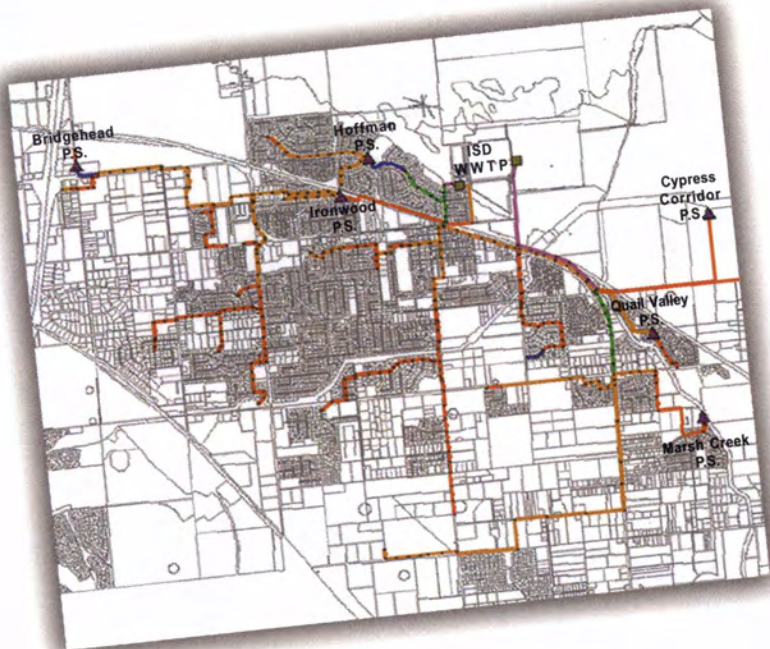
It is assumed that these four stations will be upgraded over time to match interim pumping requirements. Capital Improvement Program costs include one future upgrade of pump station capacity for the existing stations listed above and one future upsizing of pumps at the new Cypress Lakes Pumping Station and Cypress Corridor Pumping Station. The estimated cost for upgrading the Ironwood, Quail Valley and Marsh Creek pumping stations is \$378,000.

To prevent multiple pumping stations from pumping into a single forcemain and to address the need to modify WEB-14 Pumping Station due to construction of a new Bethel Island Bridge, ISD has decided to completely upgrade the WEB-14 Pumping Station at an estimated cost of \$2,000,000.

Table 5-2 summarizes the recommended Capital Improvement Program. The timeframes for implementation of the capital improvements are based on location and rate of growth within the ISD service area.

Table 5-2 Recommended Capital Improvement Program

Project Name	Total Estimated Project Costs
Neroly Road / Brownstone Road / Highway 4	\$3,118,000
Off-Island Regional Pumping Station	\$1,373,000
Cypress Corridor Pumping Station	\$1,137,000
Ruby Street / Duarte Avenue	\$304,000
Ironwood Forcemain Extension and Gravity Sewer	\$813,000
Carol Lane Relief Sewer	\$409,000
Second Street	\$257,000
Highway 4	\$5,089,000 (add \$1,134,000 for interim connection)
Ironwood, Quail Valley and Marsh Creek Pump Station Upgrades	\$378,000
WEB-14 Pump Station Upgrade	\$2,000,000
14-inch Forcemain	\$3,000,000
Total Capital Improvement Program Costs	\$17,878,000 (\$19,012,000 with interim connection)



APPENDIX A

H20 Map Sewer Model Output

FUTURE SYSTEM WITH CIP IN PLACE

ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
145	86	34-502	0.000	00:00 hr.	0.000	0.000	0.000
146	32-700	33-561	1,414.957	11:55 hr.	3.520	0.758	0.505
147	43-117	43-122.1	144.214	08:00 hr.	1.337	0.313	0.250
148	43-122	43-107	144.214	08:32 hr.	0.516	0.632	0.506
149	43-122.1	43-122.2	144.214	08:20 hr.	1.058	0.370	0.296
150	43-122.2	43-122	144.214	08:28 hr.	1.083	0.364	0.291
151	45-528	45-517	385.431	08:38 hr.	3.053	0.427	0.512
152	45-502	45-501	1,676.989	08:55 hr.	2.141	1.087	0.544
153	45-531	45-528	378.294	08:35 hr.	2.693	0.420	0.420
154	43-301	43-300	693.313	08:40 hr.	64.936	0.064	0.051
155	43-302	43-301	662.265	08:45 hr.	51.243	0.079	0.079
156	43-303	43-302	662.285	08:44 hr.	2.167	0.809	0.809
157	43-304	43-303	662.288	08:50 hr.	4.662	0.424	0.424
158	43-305	43-304	662.301	08:49 hr.	2.604	0.678	0.678
159	43-306	43-305	662.311	08:49 hr.	1.543	0.909	0.727
160	43-307	43-306	636.431	08:49 hr.	1.983	0.706	0.565
161	43-308	43-307	636.435	08:49 hr.	2.096	0.676	0.540
162	43-309	43-308	503.094	08:49 hr.	1.916	0.698	0.698
163	43-310	43-309	499.438	08:49 hr.	2.242	0.604	0.604
164	43-311	43-310	491.086	08:48 hr.	1.852	0.704	0.704
165	45-535	45-534	337.753	08:19 hr.	2.503	0.407	0.407
166	45-536	45-535	336.553	08:15 hr.	2.644	0.390	0.390
167	45-537	45-536	319.258	08:00 hr.	1.674	0.532	0.532
168	43-365	43-308	93.450	08:10 hr.	2.857	0.149	0.149
169	43-366	43-365	92.469	08:00 hr.	2.814	0.149	0.149
170	45-503	45-502	1,677.352	08:55 hr.	2.171	1.075	0.538
171	43-587	43-780	181.267	08:34 hr.	2.167	0.312	0.374
172	43-588	43-587	178.532	08:40 hr.	2.232	0.302	0.362
173	43-589	43-588	172.006	08:39 hr.	2.198	0.297	0.356
174	43-590	43-589	167.153	08:35 hr.	2.283	0.283	0.339
175	43-591	43-590	160.545	08:30 hr.	2.171	0.285	0.342
176	43-592	43-591	153.440	08:28 hr.	2.035	0.289	0.347
177	43-593	43-592	150.123	08:19 hr.	1.839	0.344	0.517
178	45-504	45-503	1,653.585	08:50 hr.	1.642	1.343	0.672
179	33-630	33-629	649.071	08:50 hr.	4.615	0.378	0.303
180	33-631	33-630	605.745	08:50 hr.	2.386	0.587	0.469

FUTURE SYSTEM WITH CIP IN PLACE

	ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
181	5003	33-632	33-631	605.891	08:49 hr.	2.365	0.591	0.473
182	5004	33-633	33-632	605.952	08:45 hr.	1.650	0.791	0.632
183	5005	33-634	33-633	606.094	08:45 hr.	2.420	0.581	0.464
184	5006	33-625	33-634	606.110	08:45 hr.	3.020	0.491	0.393
185	5007	33-629	33-566	649.071	08:45 hr.	2.122	0.615	0.410
186	5008	32-301	32-300	2.894	11:00 hr.	0.391	0.054	0.054
187	5009	32-300	32-504	4.605	11:15 hr.	0.372	0.076	0.076
188	5010	32-302	32-301	0.000	00:00 hr.	0.000	0.000	0.000
189	5011	33-729	33-702	230.002	24:05 hr.	7.379	0.144	0.144
190	5012	33-559	33-558	1,921.799	11:45 hr.	3.003	1.128	0.752
191	5013	34-532	34-507	275.488	08:50 hr.	2.168	0.307	0.175
192	5014	53-709	54-708	52.663	11:00 hr.	1.408	0.150	0.120
193	5015	54-708	54-707	294.352	10:20 hr.	1.904	0.405	0.324
194	5016	54-707	54-706	294.352	10:35 hr.	1.910	0.404	0.323
195	5017	54-706	54-705	294.352	10:40 hr.	1.919	0.403	0.322
196	5018	54-705	53-704	294.352	10:50 hr.	1.715	0.437	0.350
197	5022	43-298	44-109	796.714	08:40 hr.	3.107	0.591	0.473
198	5023	43-300	43-298	794.788	08:40 hr.	3.112	0.589	0.471
199	5024	55-123	45-506	1,147.773	08:55 hr.	4.514	0.587	0.470
200	5028	45-534	45-303	365.563	08:29 hr.	2.602	0.420	0.420
201	5029	45-303	45-531	370.190	08:30 hr.	2.674	0.415	0.415
202	5033	33-774	IRONWOODWW	68.628	08:00 hr.	1.403	0.180	0.144
203	5035	33-554	33-554.1	2,012.166	11:50 hr.	4.004	0.772	0.386
204	5036	33-554.1	IRONWOODWW	2,012.166	11:45 hr.	5.950	0.579	0.289
205	5038	33-709	33-709WW	63.642	08:00 hr.	2.546	0.084	0.028
206	53	55-100	45-506	505.610	08:46 hr.	4.115	0.343	0.275
207	54	55-102	55-100	496.528	08:34 hr.	2.311	0.517	0.413
208	55	55-103	55-102	481.154	08:25 hr.	1.333	0.779	0.623
209	559	44-504	44-503	691.272	08:45 hr.	2.289	0.799	0.799
210	56	55-104	55-103	480.808	08:25 hr.	3.396	0.468	0.562
211	560	44-505	44-504	658.273	08:44 hr.	2.251	0.773	0.773
212	561	44-506	44-505	658.280	08:44 hr.	2.714	0.650	0.650
213	562	44-507	44-506	328.042	08:49 hr.	3.914	0.287	0.287
214	563	44-508	44-507	328.042	08:49 hr.	3.564	0.307	0.307
215	564	44-509	44-508	328.042	08:39 hr.	2.111	0.454	0.454
216	565	44-510	44-509	328.042	08:45 hr.	5.210	0.235	0.235

FUTURE SYSTEM WITH CIP IN PLACE

ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
217	55-105	55-104	477.543	08:23 hr.	2.812	0.546	0.655
218	43-771	44-506	290.170	08:44 hr.	2.266	0.432	0.518
219	43-772	43-771	283.525	08:50 hr.	2.223	0.430	0.517
220	43-773	43-772	281.720	08:49 hr.	2.510	0.389	0.467
221	43-774	43-773	267.007	08:50 hr.	2.380	0.389	0.467
222	43-775	43-774	259.932	08:49 hr.	2.448	0.373	0.448
223	43-776	43-775	258.409	08:49 hr.	2.337	0.385	0.462
224	43-777	43-776	235.687	08:48 hr.	2.218	0.373	0.448
225	55-106	55-105	475.708	08:10 hr.	2.340	0.645	0.774
226	43-778	43-777	232.332	08:48 hr.	2.247	0.366	0.439
227	43-779	43-778	218.974	08:45 hr.	2.253	0.349	0.419
228	43-780	43-779	205.369	08:40 hr.	2.243	0.334	0.400
229	55-107	55-106	454.045	08:00 hr.	3.485	0.438	0.525
230	45-505	45-504	1,653.740	08:55 hr.	1.886	0.812	0.541
231	5004	5000	333.232	08:54 hr.	2.799	0.336	0.269
232	5000	5003	378.507	08:54 hr.	2.903	0.358	0.287
233	5002	5022	544.365	09:00 hr.	3.215	0.433	0.346
234	53-702	5004	294.350	10:55 hr.	2.701	0.315	0.252
235	54-110	54-307	311.336	08:00 hr.	1.937	0.417	0.333
236	5008	54-708	115.470	11:00 hr.	1.492	0.271	0.271
237	42-760	42-708	107.551	11:17 hr.	4.741	0.135	0.202
238	5012	42-760	107.551	11:00 hr.	1.961	0.254	0.381
239	44-100	34-511	430.343	08:30 hr.	43.326	0.057	0.038
240	44-101	44-100	430.344	08:30 hr.	41.769	0.059	0.039
241	44-102	44-101	430.345	08:30 hr.	41.605	0.059	0.039
242	44-103	44-102	430.346	08:30 hr.	42.802	0.058	0.039
243	44-104	44-103	430.346	08:30 hr.	37.916	0.063	0.042
244	44-105	44-104	430.347	08:30 hr.	39.704	0.061	0.040
245	44-106	44-105	430.354	08:29 hr.	1.850	0.502	0.335
246	44-107	34-511	1,608.044	08:45 hr.	4.260	0.722	0.481
247	44-108	44-107	1,608.655	08:45 hr.	2.625	1.082	0.722
248	44-109	44-108	1,608.898	08:45 hr.	2.631	1.080	0.720
249	44-110	44-109	814.553	08:54 hr.	3.784	0.517	0.414
250	44-111	44-110	814.597	08:50 hr.	4.314	0.469	0.375
251	44-112	44-111	814.785	08:50 hr.	3.028	0.614	0.491
252	44-113	44-112	803.812	08:50 hr.	4.002	0.491	0.393

FUTURE SYSTEM WITH CIP IN PLACE

	ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
253		44-114	44-113	750.893	08:50 hr.	6.596	0.325	0.260
254		44-115	44-114	722.614	08:50 hr.	3.575	0.493	0.395
255		44-116	44-115	722.678	08:49 hr.	2.571	0.635	0.508
256		45-506	45-505	1,655.037	08:55 hr.	2.121	1.084	0.542
257		44-300	44-106	430.357	08:30 hr.	38.663	0.062	0.041
258		44-301	44-300	77.935	08:10 hr.	25.201	0.026	0.017
259		44-302	44-301	77.935	08:10 hr.	24.348	0.027	0.018
260		44-303	44-302	77.935	08:05 hr.	23.660	0.027	0.018
261		44-304	44-303	77.935	08:00 hr.	21.341	0.029	0.020
262		44-305	44-304	0.000	00:00 hr.	0.000	0.000	0.000
263		44-306	44-305	0.000	00:00 hr.	0.000	0.000	0.000
264		44-307	44-306	0.000	00:00 hr.	0.000	0.000	0.000
265		44-308	44-307	0.000	00:00 hr.	0.000	0.000	0.000
266		44-309	44-300	352.422	08:29 hr.	3.009	0.367	0.367
267		44-310	44-309	351.817	08:29 hr.	2.101	0.480	0.480
268		44-311	44-310	349.461	08:29 hr.	2.081	0.481	0.481
269		44-311.1	44-311	294.162	08:29 hr.	1.953	0.443	0.443
270		44-311.2	44-311.1	294.162	08:35 hr.	2.613	0.356	0.356
271		44-500	44-116	722.746	08:50 hr.	1.818	0.848	0.678
272		44-501	44-500	722.757	08:49 hr.	2.992	0.648	0.648
273		44-502	44-501	722.761	08:45 hr.	2.737	0.701	0.701
274		44-503	44-502	708.043	08:44 hr.	2.009	1.000	1.000
275		44-700	44-308	1,706.348	09:00 hr.	4.624	0.616	0.308
276		44-701	44-700	1,707.575	09:00 hr.	2.150	1.099	0.550
277		44-702	44-701	1,707.979	08:59 hr.	2.140	1.104	0.552
278		44-703	44-702	1,674.563	09:00 hr.	2.153	1.081	0.541
279		44-712	44-311.2	294.163	08:33 hr.	2.104	0.418	0.418
280		44-713	44-712	294.163	08:40 hr.	1.182	0.665	0.665
281		55-123.1	55-123	1,127.461	08:59 hr.	2.991	0.809	0.647
282		44-731	44-732	88.355	08:38 hr.	1.879	0.227	0.340
283		44-732	44-733	90.936	08:43 hr.	1.873	0.232	0.348
284		44-733	44-734	93.436	08:44 hr.	2.310	0.203	0.305
285		44-734	44-735	102.782	08:50 hr.	1.479	0.304	0.456
286		44-735	44-736	107.649	08:49 hr.	1.961	0.254	0.381
287		44-736	44-736.1	214.160	08:50 hr.	2.292	0.311	0.311
288		44-736.1	44-736.2	214.160	08:55 hr.	2.153	0.325	0.325

FUTURE SYSTEM WITH CIP IN PLACE

ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
289	44-736.2	44-736.3	214.160	08:48 hr.	2.199	0.320	0.320
290	44-736.3	44-736.4	214.160	08:50 hr.	2.086	0.333	0.333
291	44-736.4	44-713	214.160	08:45 hr.	3.486	0.230	0.230
292	44-745	44-731	86.392	08:34 hr.	1.839	0.227	0.340
293	44-746	44-745	78.790	08:30 hr.	1.802	0.215	0.323
294	44-747	44-746	77.618	08:29 hr.	1.131	0.301	0.451
295	44-748	44-747	17.499	08:24 hr.	1.464	0.087	0.130
296	44-749	44-748	13.301	08:24 hr.	1.103	0.087	0.131
297	44-750	44-749	11.556	08:19 hr.	1.036	0.083	0.124
298	44-751	44-750	6.088	08:10 hr.	1.104	0.057	0.113
299	44-752	44-751	3.114	08:00 hr.	0.460	0.065	0.131
300	44-753	44-752	0.000	00:00 hr.	0.000	0.000	0.000
301	32-700	33-629	0.000	00:00 hr.	0.000	0.000	0.000
302	32-701	32-700	1,415.172	11:50 hr.	2.493	1.009	0.673
303	32-702	32-701	1,391.165	11:49 hr.	2.458	1.007	0.671
304	32-703	32-702	1,391.352	11:55 hr.	2.821	0.894	0.596
305	32-704	32-703	1,392.013	11:54 hr.	4.024	0.675	0.450
306	32-705	32-704	1,380.390	11:54 hr.	1.740	1.500	1.000
307	32-706	32-705	1,159.324	11:55 hr.	1.884	1.086	0.724
308	32-707	32-706	1,159.981	11:49 hr.	1.838	1.113	0.742
309	32-708	32-707	1,160.831	11:49 hr.	2.061	1.002	0.668
310	32-709	32-708	1,163.226	11:45 hr.	1.780	1.152	0.768
311	32-710	32-709	1,164.246	11:45 hr.	2.101	0.988	0.659
312	32-711	32-710	1,167.355	11:40 hr.	1.701	1.211	0.808
313	32-712	32-711	1,154.171	11:40 hr.	2.592	0.822	0.548
314	32-713	32-712	686.458	11:34 hr.	0.865	1.500	1.000
315	32-714	32-713	690.542	11:29 hr.	1.567	0.816	0.544
316	32-100	32-714	478.982	11:35 hr.	2.508	0.435	0.290
317	32-101	32-100	434.177	11:55 hr.	1.494	0.592	0.394
318	32-102	32-101	437.402	11:54 hr.	1.503	0.592	0.395
319	32-103	32-102	383.706	11:50 hr.	1.420	0.560	0.374
320	32-104	32-103	401.375	11:25 hr.	1.588	0.533	0.356
321	32-105	32-104	384.186	11:20 hr.	1.235	0.622	0.415
322	32-107	32-110	6.815	11:00 hr.	0.967	0.060	0.091
323	32-108	32-109	11.587	11:00 hr.	1.481	0.065	0.097
324	32-109	32-110	13.690	11:00 hr.	2.278	0.054	0.081

FUTURE SYSTEM WITH CIP IN PLACE

	ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
325	888	32-500	32-105	258.468	11:50 hr.	1.935	0.404	0.404
326	889	32-501	32-500	258.468	11:48 hr.	2.585	0.327	0.327
327	890	32-502	32-501	256.354	11:50 hr.	2.335	0.350	0.350
328	891	32-503	32-502	233.492	11:43 hr.	1.820	0.392	0.392
329	892	32-504	32-503	229.678	11:39 hr.	1.906	0.374	0.374
330	894	32-715	32-705	244.012	08:54 hr.	3.016	0.280	0.280
331	895	32-716	32-715	231.116	08:54 hr.	1.888	0.379	0.379
332	896	32-717	32-716	221.959	08:52 hr.	2.114	0.338	0.338
333	897	32-718	32-717	217.743	08:49 hr.	1.950	0.354	0.354
334	898	32-719	32-718	202.282	08:41 hr.	1.523	0.403	0.403
335	899	32-720	32-715	6.921	08:00 hr.	0.706	0.065	0.065
336	906	32-726	32-719	18.554	08:24 hr.	1.528	0.076	0.076
337	907	32-727	32-726	18.554	08:00 hr.	0.903	0.108	0.108
338	910	33-100	33-505	77.873	08:24 hr.	1.165	0.224	0.179
339	911	33-101	33-100	74.557	08:20 hr.	1.228	0.209	0.167
340	912	33-102	33-101	17.834	08:00 hr.	0.824	0.112	0.112
341	988	33-500	33-712	180.301	08:33 hr.	1.467	0.343	0.275
342	989	33-501	33-500	180.301	08:40 hr.	0.831	0.520	0.416
343	990	33-502	33-501	157.881	08:38 hr.	1.301	0.340	0.272
344	991	33-503	33-502	94.396	08:29 hr.	1.151	0.258	0.206
345	992	33-504	33-503	94.396	08:25 hr.	1.214	0.249	0.199
346	993	33-505	33-504	94.396	08:30 hr.	0.975	0.290	0.232
347	CYPRESS CORR	YPRESS CORR_MYPRESS CORR_WI		1,601.194	08:00 hr.	4.542	1.000	1.000
348	CYPRESS LAKES	CYPRESS LAKES YPRESS LAKES_W		5,143.787	08:05 hr.	18.228	0.637	0.510

PIPE INFORMATION

	ID (Char)	FROM_INV (Num)	TO_INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
1	8	15,000	14,100	210,000	12,000	0.012	
2	9	15,000	15,100	181,000	12,000	0.012	
3	10	16,000	15,100	291,000	12,000	0.012	
4	11	16,000	16,100	85,000	8,000	0.012	
5	12	17,000	16,100	256,000	8,000	0.012	
6	13	17,000	17,100	150,000	8,000	0.012	
7	14	17,000	17,100	199,000	8,000	0.012	
8	15	19,000	17,100	335,000	8,000	0.012	
9	16	9,000	7,100	400,000	6,000	0.012	
10	18	9,000	7,100	162,000	6,000	0.012	
11	19	10,000	9,100	245,000	6,000	0.012	
12	20	13,000	10,100	358,000	6,000	0.012	
13	21	15,000	13,100	345,000	6,000	0.012	
14	22	15,000	12,100	132,000	6,000	0.012	
15	23	12,000	11,100	220,000	8,000	0.012	
16	24	18,000	12,100	178,000	6,000	0.012	
17	25	19,000	18,100	114,000	6,000	0.012	
18	26	19,100	19,100	2,600,000	10,000	0.012	
19	28	12,000	8,100	322,000	6,000	0.012	
20	29	14,000	8,100	85,000	6,000	0.012	
21	31	14,000	8,100	307,000	6,000	0.012	
22	32	9,000	8,100	304,000	12,000	0.012	
23	33	11,000	9,100	303,000	12,000	0.012	
24	37	13,000	12,100	179,000	8,000	0.012	
25	38	18,000	13,100	60,000	6,000	0.012	
26	39	14,000	13,100	172,000	8,000	0.012	
27	40	14,000	14,100	45,000	8,000	0.012	
28	41	0,000	14,100	60,000	5,000	0.012	
29	42	0,000	14,100	173,000	8,000	0.012	
30	43	15,000	0,100	53,000	8,000	0.012	
31	44	17,000	0,100	378,000	6,000	0.012	
32	45	17,000	17,100	174,000	5,000	0.012	
33	46	17,000	15,100	398,000	6,000	0.012	
34	47	15,000	13,100	174,000	6,000	0.012	
35	48	13,000	12,100	198,000	6,000	0.012	
36	49	16,000	13,100	363,000	6,000	0.012	
37	50	16,000	14,100	293,000	6,000	0.012	
38	51	12,000	12,100	55,000	6,000	0.012	

PIPE INFORMATION

	ID (Char)	FROM_INV (Num)	TO_INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
39		18.000	17.100	163.000	10.000	0.012	
40		19.000	18.100	263.000	10.000	0.012	
41		20.000	19.100	405.000	10.000	0.012	
42		21.000	20.100	147.000	10.000	0.012	
43		19.000	18.100	199.000	6.000	0.012	
44		20.000	19.100	93.000	6.000	0.012	
45		20.000	19.100	212.000	6.000	0.012	
46		21.000	19.100	357.000	8.000	0.012	
47		22.000	21.100	205.000	6.000	0.012	
48		18.000	16.800	182.000	10.000	0.012	
49		19.000	18.100	254.000	10.000	0.012	
50		19.000	19.100	96.000	10.000	0.012	
51		17.000	16.150	188.000	8.000	0.012	
52		17.000	17.100	69.000	8.000	0.012	
53		19.000	17.100	350.000	8.000	0.012	
54		20.000	19.100	156.000	6.000	0.012	
55		20.000	19.100	203.000	6.000	0.012	
56		20.000	19.050	230.000	6.000	0.012	
57		20.000	19.100	208.000	6.000	0.012	
58		19.000	17.100	247.000	8.000	0.012	
59		17.000	16.100	200.000	8.000	0.012	
60		16.000	15.590	79.000	8.000	0.012	
61		15.000	14.235	193.000	15.000	0.012	
62		20.000	18.950	250.000	8.000	0.012	
63		21.000	20.100	287.000	8.000	0.012	
64		22.000	21.100	269.000	6.000	0.012	
65		22.000	21.100	280.000	8.000	0.012	
66		23.000	22.100	205.000	6.000	0.012	
67		23.000	21.100	270.000	6.000	0.012	
68		24.000	23.100	299.000	6.000	0.012	
69		24.000	23.100	139.000	6.000	0.012	
70		23.000	22.100	301.000	12.000	0.012	
71		22.000	21.100	301.000	12.000	0.012	
72		18.000	17.100	146.000	6.000	0.012	
73		19.000	17.100	220.000	6.000	0.012	
74		46.360	46.360	40.000	10.000	0.012	
75		51.000	49.140	412.000	8.000	0.012	
76		56.000	51.100	304.000	8.000	0.012	
77							

PIPE INFORMATION

	ID (Char)	FROM INV (Num)	TO INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
77	88	55.000	56.100	270.000	8.000	0.012	
78	89	60.000	55.100	116.000	8.000	0.012	
79	90	63.000	60.100	281.000	8.000	0.012	
80	91	67.000	63.100	264.000	8.000	0.012	
81	92	68.000	67.100	130.000	8.000	0.012	
82	93	68.000	67.100	178.000	8.000	0.012	
83	94	74.000	66.100	284.000	8.000	0.012	
84	95	66.000	63.100	273.000	8.000	0.012	
85	96	68.000	66.100	143.000	8.000	0.012	
86	97	68.000	55.100	212.000	8.000	0.012	
87	98	55.000	68.100	208.000	8.000	0.012	
88	99	57.000	55.100	230.000	8.000	0.012	
89	100	58.000	57.100	315.000	8.000	0.012	
90	101	60.000	58.100	369.000	8.000	0.012	
91	102	61.000	60.100	141.000	8.000	0.012	
92	103	50.000	45.910	258.000	8.000	0.012	
93	104	56.000	50.100	200.000	8.000	0.012	
94	105	54.000	56.100	66.000	8.000	0.012	
95	106	52.000	54.100	171.000	8.000	0.012	
96	107	59.000	52.100	312.000	8.000	0.012	
97	108	54.000	52.100	369.000	8.000	0.012	
98	109	60.000	54.100	288.000	8.000	0.012	
99	110	63.000	60.100	295.000	8.000	0.012	
100	111	70.000	63.100	269.000	8.000	0.012	
101	112	77.000	70.100	300.000	8.000	0.012	
102	113	67.000	60.100	436.000	8.000	0.012	
103	114	57.000	54.100	310.000	8.000	0.012	
104	115	62.000	60.100	126.000	8.000	0.012	
105	116	60.000	52.100	195.000	8.000	0.012	
106	117	61.000	60.100	210.000	8.000	0.012	
107	118	64.000	54.100	272.000	8.000	0.012	
108	119	64.000	80.100	916.000	8.000	0.012	
109	120	62.000	64.100	50.000	15.000	0.012	
110	121	66.000	65.760	241.000	15.000	0.012	
111	122	67.000	66.100	370.000	15.000	0.012	
112	123	68.000	67.100	357.000	15.000	0.012	
113	124	68.000	68.100	325.000	15.000	0.012	
114	125	69.000	68.100	320.000	12.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM_INV (Num)	TO_INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
115		29.000	29.100	81.000	12.000	0.012	
116		21.390	21.330	40.000	15.000	0.012	
117		22.000	21.100	189.000	10.000	0.012	
118		23.000	22.100	265.000	10.000	0.012	
119		24.000	23.100	270.000	10.000	0.012	
120		30.000	24.100	271.000	10.000	0.012	
121		26.000	30.100	253.000	10.000	0.012	
122		27.000	26.100	252.000	10.000	0.012	
123		28.000	27.100	259.000	8.000	0.012	
124		29.000	28.100	150.000	8.000	0.012	
125		30.000	28.100	341.000	8.000	0.012	
126		29.000	27.100	293.000	8.000	0.012	
127		28.000	26.100	207.000	8.000	0.012	
128		28.000	23.100	402.000	8.000	0.012	
129		36.000	28.100	442.000	8.000	0.012	
130		36.000	36.100	66.000	8.000	0.012	
131		28.000	22.100	450.000	8.000	0.012	
132		29.000	28.100	84.000	8.000	0.012	
133		30.000	24.100	80.000	8.000	0.012	
134		24.000	18.280	285.000	8.000	0.012	
135		26.000	24.100	301.000	8.000	0.012	
136		27.000	26.100	265.000	8.000	0.012	
137		29.000	26.100	311.000	8.000	0.012	
138		31.000	29.100	211.000	8.000	0.012	
139		29.000	29.100	124.000	8.000	0.012	
140		30.000	29.100	184.000	8.000	0.012	
141		30.000	25.100	280.000	8.000	0.012	
142		25.000	17.300	351.000	8.000	0.012	
143		26.000	25.100	270.000	8.000	0.012	
144		25.000	17.000	430.000	8.000	0.012	
145		18.000	16.700	55.000	8.000	0.012	
146		29.000	18.070	359.000	8.000	0.012	
147		19.140	14.380	270.000	6.000	0.012	
148		19.910	19.240	154.000	6.000	0.012	
149		22.080	13.210	289.000	6.000	0.012	
150		26.080	22.180	400.000	6.000	0.012	
151		15.510	14.530	350.000	8.000	0.012	
152		16.710	15.610	341.000	8.000	0.012	

PIPE INFORMATION

	ID (Chart)	FROM INV (Num)	TO INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
153	210	28.500	33.910	282.000	8.000	0.012	
154	211	26.000	16.810	100.000	6.000	0.012	
155	212	26.800	25.130	183.000	6.000	0.012	
156	213	25.030	18.920	525.000	6.000	0.012	
157	214	18.820	16.790	436.000	8.000	0.012	
158	215	20.080	18.920	227.000	8.000	0.012	
159	216	16.690	15.300	294.000	8.000	0.012	
160	218	19.310	14.650	40.000	15.000	0.012	
161	219	15.300	15.300	221.000	6.000	0.012	
162	220	21.410	19.410	309.000	6.000	0.012	
163	221	19.310	19.410	180.000	15.000	0.012	
164	225	24.710	19.410	342.000	6.000	0.012	
165	226	24.090	19.410	371.000	6.000	0.012	
166	227	23.270	18.760	392.000	8.000	0.012	
167	228	18.660	17.780	297.000	8.000	0.012	
168	229	17.680	16.810	242.000	8.000	0.012	
169	230	20.100	17.780	242.000	8.000	0.012	
170	231	20.930	20.200	190.000	8.000	0.012	
171	232	20.930	21.030	430.000	8.000	0.012	
172	233	23.830	21.030	400.000	6.000	0.012	
173	234	27.990	22.990	119.000	6.000	0.012	
174	235	22.890	23.550	278.000	6.000	0.012	
175	236	23.450	22.210	354.000	8.000	0.012	
176	237	22.110	20.810	400.000	8.000	0.012	
177	238	20.710	19.810	256.000	8.000	0.012	
178	239	19.710	18.760	271.000	8.000	0.012	
179	240	20.680	19.810	214.000	8.000	0.012	
180	241	22.920	20.780	429.000	6.000	0.012	
181	242	21.210	19.810	368.000	8.000	0.012	
182	243	22.470	21.310	360.000	8.000	0.012	
183	244	24.680	22.570	384.000	6.000	0.012	
184	245	22.610	21.810	142.000	6.000	0.012	
185	246	21.710	20.810	285.000	8.000	0.012	
186	247	23.260	21.810	444.000	8.000	0.012	
187	248	27.200	22.570	187.000	8.000	0.012	
188	249	29.310	27.300	215.000	8.000	0.012	
189	250	30.520	29.410	270.000	8.000	0.012	
190	251	43.300	30.620	222.000	8.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM INV (Num)	TO INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
191	252	43.300	29.300	300.000	8.000	0.012	
192	253	17.020	15.300	350.000	8.000	0.012	
193	254	17.470	17.120	30.000	8.000	0.012	
194	255	18.350	17.570	212.000	8.000	0.012	
195	256	20.650	18.450	355.000	8.000	0.012	
196	257	21.650	20.750	125.000	8.000	0.012	
197	258	21.740	21.750	27.000	8.000	0.012	
198	259	21.750	21.840	244.000	8.000	0.012	
199	262	25.120	24.522	228.000	8.000	0.012	
200	263	25.580	25.220	132.000	8.000	0.012	
201	264	26.280	25.680	331.000	8.000	0.012	
202	265	26.880	26.380	173.000	8.000	0.012	
203	266	28.000	26.980	316.000	8.000	0.012	
204	267	29.200	28.100	206.000	8.000	0.012	
205	268		28.100	284.000	8.000	0.012	
206	269	40.640	0.100	100.000	8.000	0.012	
207	271	42.000	40.740	390.000	8.000	0.012	
208	272	22.610	22.710	206.000	8.000	0.012	
209	273	21.790	21.840	254.000	8.000	0.012	
210	274	23.040	22.710	210.000	8.000	0.012	
211	275	25.350	22.710	349.000	8.000	0.012	
212	276	30.100	29.178	261.000	8.000	0.012	
213	277	28.960	26.980	382.000	6.000	0.012	
214	278	35.500	33.210	83.000	6.000	0.012	
215	279	27.720	26.380	383.000	8.000	0.012	
216	280	36.060	27.820	381.000	8.000	0.012	
217	281	39.180	36.160	120.000	8.000	0.012	
218	282	30.980	27.820	266.000	6.000	0.012	
219	283	39.910	31.080	368.000	6.000	0.012	
220	284	41.600	40.360	229.000	8.000	0.012	
221	285	24.610	24.671	82.000	6.000	0.012	
222	286	26.470	24.671	465.000	6.000	0.012	
223	287	27.150	26.570	123.000	6.000	0.012	
224	288	27.060	26.570	70.000	6.000	0.012	
225	289	27.200	26.280	250.000	8.000	0.012	
226	290	27.890	27.300	172.000	8.000	0.012	
227	291	26.180	24.990	324.000	8.000	0.012	
228	292	24.890	24.170	230.000	8.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM INV (Num)	TO INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
229		20.070	24.990	385.000	6.000	0.012	
230		28.900	26.280	500.000	6.000	0.012	
231		29.910	27.300	475.000	6.000	0.012	
232		7.690	0.100	265.000	15.000	0.012	
233		20.380	12.390	266.000	8.000	0.012	
234		20.480	20.480	78.000	6.000	0.012	
235			0.200	160.000	6.000	0.012	
236		13.000	12.810	70.000	8.000	0.012	
237		13.980	12.810	130.000	8.000	0.012	
238		12.710	10.460	204.000	8.000	0.012	
239		15.790	12.810	248.000	8.000	0.012	
240		15.790	8.800	357.000	8.000	0.012	
241		8.800	8.800	200.000	4.000	0.012	
242		13.300	8.800	268.000	6.000	0.012	
243		14.000	13.400	195.000	6.000	0.012	
244		14.980	13.400	285.000	6.000	0.012	
245		16.270	15.080	350.000	6.000	0.012	
246		17.690	16.370	350.000	6.000	0.012	
247		21.190	17.790	350.000	6.000	0.012	
248		25.000	21.290	357.000	6.000	0.012	
249		15.730	14.955	325.000	6.000	0.012	
250		18.600	19.410	365.000	6.000	0.012	
251		20.320	18.700	237.000	6.000	0.012	
252		9.190	7.790	260.000	8.000	0.012	
253		13.350	9.290	269.000	8.000	0.012	
254		14.350	13.450	150.000	6.000	0.012	
255		17.200	13.450	340.000	6.000	0.012	
256		20.250	17.300	63.000	6.000	0.012	
257		20.610	20.350	115.000	6.000	0.012	
258		20.930	20.710	80.000	6.000	0.012	
259		22.900	21.030	290.000	6.000	0.012	
260		21.540	20.710	183.000	6.000	0.012	
261		22.289	21.640	188.000	6.000	0.012	
262		22.389	22.389	177.000	6.000	0.012	
263		23.820	0.100	182.000	6.000	0.012	
264		27.200	25.110	275.000	6.000	0.012	
265		26.210	27.300	222.000	6.000	0.012	
266		24.640	23.920	180.000	6.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM INV (Num)	TO INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
267	348	25.490	24.740	145.000	8.000	0.012	
268	349	26.200	25.590	43.000	8.000	0.012	
269	350	27.490	26.300	396.000	8.000	0.012	
270	351	28.600	27.590	335.000	8.000	0.012	
271	352	29.380	27.590	400.000	8.000	0.012	
272	353	29.990	29.480	294.000	10.000	0.012	
273	354	30.140	30.090	219.000	10.000	0.012	
274	355	32.400	30.240	295.000	8.000	0.012	
275	356	32.400	31.340	41.000	8.000	0.012	
276	357	31.240	27.800	160.000	10.000	0.012	
277	358	32.890	31.340	396.000	8.000	0.012	
278	359	30.750	29.480	253.000	8.000	0.012	
279	360	30.750	24.810	216.000	8.000	0.012	
280	361	32.590	30.850	348.000	6.000	0.012	
281	362	24.710	21.980	454.000	8.000	0.012	
282	363	26.370	24.810	310.000	8.000	0.012	
283	364	21.880	18.780	500.000	8.000	0.012	
284	365	18.680	10.480	500.000	8.000	0.012	
285	366	18.190	12.390	268.000	8.000	0.012	
286	367	24.850	18.290	309.000	6.000	0.012	
287	368	16.400	18.290	271.000	6.000	0.012	
288	369	19.040	18.290	259.000	8.000	0.012	
289	370	25.950	19.140	309.000	6.000	0.012	
290	371	23.740	19.140	271.000	6.000	0.012	
291	374	28.000	16.930	263.000	6.000	0.012	
292	375	17.980	16.930	261.000	10.000	0.012	
293	376	25.430	18.080	399.000	8.000	0.012	
294	377	26.530	25.530	315.000	8.000	0.012	
295	378	19.010	18.080	294.000	10.000	0.012	
296	379	19.780	19.110	219.000	10.000	0.012	
297	380	27.830	19.880	276.000	6.000	0.012	
298	381	20.760	19.880	281.000	10.000	0.012	
299	382	28.020	20.860	214.000	6.000	0.012	
300	383	27.300	20.860	252.000	10.000	0.012	
301	384	29.000	27.400	214.000	6.000	0.012	
302	385	27.700	27.400	252.000	10.000	0.012	
303	386	28.700	27.800	199.000	6.000	0.012	
304	387	32.070	25.260	100.000	8.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM INV (Num)	TO INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
305		25.160	23.990	183.000	8.000	0.012	
306		31.620	25.260	100.000	8.000	0.012	
307		23.890	21.030	378.000	8.000	0.012	
308		25.290	23.990	200.000	8.000	0.012	
309		26.350	23.990	320.000	8.000	0.012	
310		30.930	26.450	109.000	8.000	0.012	
311		28.370	26.450	260.000	8.000	0.012	
312		30.750	28.470	108.000	8.000	0.012	
313		30.370	28.470	259.000	8.000	0.012	
314		31.410	30.470	109.000	8.000	0.012	
315		17.800	8.800	460.000	6.000	0.012	
316		20.500	17.900	278.000	6.000	0.012	
317		25.800	19.880	206.000	6.000	0.012	
318		24.380	20.700	203.000	6.000	0.012	
319		31.160	30.620	155.000	8.000	0.012	
320		32.150	31.260	254.000	8.000	0.012	
321		33.060	32.260	254.000	8.000	0.012	
322		33.980	33.160	262.000	8.000	0.012	
323		41.700	34.080	316.000	6.000	0.012	
324		40.490	34.080	57.000	6.000	0.012	
325		35.070	34.080	254.000	8.000	0.012	
326		39.720	35.170	322.000	6.000	0.012	
327		43.560	39.820	374.000	6.000	0.012	
328		37.170	31.260	322.000	6.000	0.012	
329		41.540	37.270	435.000	6.000	0.012	
330		36.040	31.260	135.000	6.000	0.012	
331		38.400	36.140	159.000	6.000	0.012	
332		40.500	32.250	404.000	6.000	0.012	
333		45.060	40.600	334.000	6.000	0.012	
334		43.080	36.680	346.000	6.000	0.012	
335		36.580	35.170	404.000	8.000	0.012	
336		33.800	33.160	128.000	6.000	0.012	
337		26.850	36.140	275.000	6.000	0.012	
338		31.770	26.950	100.000	6.000	0.012	
339		30.300	26.950	255.000	6.000	0.012	
340		33.860	32.340	78.000	6.000	0.012	
341		32.240	30.400	383.000	6.000	0.012	
342		36.790	32.340	264.000	6.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM INV (Num)	TO INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
343	426	44.690	32.340	390.000	6.000	0.012	
344	427	44.440	36.890	256.000	6.000	0.012	
345	428	48.440	44.540	390.000	6.000	0.012	
346	429	50.530	44.540	196.000	6.000	0.012	
347	430	44.480	33.160	415.000	6.000	0.012	
348	431	38.420	0.100	110.000	8.000	0.012	
349	433	38.520	38.520	314.000	6.000	0.012	
350	434	39.900	39.370	172.000	8.000	0.012	
351	435	40.650	40.000	166.000	8.000	0.012	
352	436	41.650	40.750	257.000	8.000	0.012	
353	437	42.440	41.750	194.000	8.000	0.012	
354	438	41.650	40.750	257.000	8.000	0.012	
355	439	42.870	41.750	95.000	8.000	0.012	
356	440	42.360	41.750	175.000	8.000	0.012	
357	441	42.360	41.750	175.000	8.000	0.012	
358	442	39.150	38.520	105.000	8.000	0.012	
359	443	40.470	39.250	224.000	8.000	0.012	
360	444	41.640	40.570	194.000	8.000	0.012	
361	445	43.820	41.740	132.000	8.000	0.012	
362	446	44.450	42.970	325.000	8.000	0.012	
363	447	45.370	44.550	120.000	8.000	0.012	
364	448	46.150	45.470	100.000	8.000	0.012	
365	450	37.350	36.680	255.000	8.000	0.012	
366	451	37.580	37.450	65.000	8.000	0.012	
367	452	38.770	37.680	270.000	8.000	0.012	
368	453	39.950	38.870	245.000	8.000	0.012	
369	454	40.980	40.050	269.000	8.000	0.012	
370	455	46.570	40.000	317.000	8.000	0.012	
371	456	48.720	46.670	409.000	8.000	0.012	
372	457	49.820	48.820	241.000	8.000	0.012	
373	458	50.140	49.920	264.000	8.000	0.012	
374	459	51.530	50.240	264.000	8.000	0.012	
375	460	52.120	51.630	98.000	8.000	0.012	
376	461	58.100	51.630	119.000	8.000	0.012	
377	462	58.000	50.240	114.000	8.000	0.012	
378	463	57.000	49.920	114.000	8.000	0.012	
379	464	41.600	41.080	118.000	6.000	0.012	
380	465	42.820	41.700	229.000	6.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM_INV (Num)	TO_INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
381	466	42.210	42.920	258.000	15.000	0.012	
382	467	40.150	38.870	366.000	8.000	0.012	
383	468	41.150	40.250	360.000	8.000	0.012	
384	469	42.890	41.250	350.000	8.000	0.012	
385	470	43.440	42.990	128.000	8.000	0.012	
386	471	46.310	43.540	252.000	8.000	0.012	
387	472	47.310	46.410	200.000	8.000	0.012	
388	473	49.670	47.410	180.000	8.000	0.012	
389	474	52.120	47.410	350.000	8.000	0.012	
390	475	52.000	46.320	402.000	6.000	0.012	
391	476	46.220	43.540	256.000	6.000	0.012	
392	477	55.580	46.320	97.000	6.000	0.012	
393	478	43.900	42.990	261.000	8.000	0.012	
394	479	44.440	44.000	54.000	6.000	0.012	
395	480	47.250	44.000	325.000	6.000	0.012	
396	481	49.020	47.350	167.000	6.000	0.012	
397	482	38.460	37.450	298.000	8.000	0.012	
398	483	39.420	38.560	245.000	10.000	0.012	
399	484	42.050	39.520	253.000	6.000	0.012	
400	485	44.500	42.150	175.000	6.000	0.012	
401	486	37.130	36.680	70.000	6.000	0.012	
402	487	49.250	37.230	400.000	6.000	0.012	
403	488	51.290	49.350	215.000	6.000	0.012	
404	489	51.290	42.270	230.000	6.000	0.012	
405	490	40.360	37.680	257.000	6.000	0.012	
406	491	44.300	40.460	100.000	6.000	0.012	
407	492	41.220	40.460	154.000	6.000	0.012	
408	493	41.720	40.360	420.000	10.000	0.012	
409	494	42.140	41.820	90.000	10.000	0.012	
410	495	43.400	42.240	331.000	10.000	0.012	
411	496	44.570	43.500	269.000	10.000	0.012	
412	497	45.570	44.670	252.000	10.000	0.012	
413	498	46.260	45.670	191.000	10.000	0.012	
414	499	47.400	46.360	447.000	8.000	0.012	
415	500	48.840	47.500	324.000	8.000	0.012	
416	501	47.700	45.670	178.000	8.000	0.012	
417	502	53.440	45.670	265.000	8.000	0.012	
418	503	46.150	44.670	177.000	8.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM INV (Num)	TO INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
419	504	47.380	44.670	330.000	8.000	0.012	
420	505	47.380	42.240	266.000	8.000	0.012	
421	506	43.870	43.500	74.000	8.000	0.012	
422	507	44.530	43.210	275.000	8.000	0.012	
423	508	45.350	43.970	188.000	8.000	0.012	
424	509	41.820	41.820	257.000	8.000	0.012	
425	512	26.550	25.100	187.000	8.000	0.012	
426	513	29.650	26.650	233.000	8.000	0.012	
427	514	29.880	29.750	310.000	8.000	0.012	
428	515	30.710	29.980	209.000	8.000	0.012	
429	516	31.490	30.810	195.000	8.000	0.012	
430	517	31.450	30.810	106.000	6.000	0.012	
431	518	27.190	26.650	90.000	6.000	0.012	
432	519	29.400	28.700	230.000	8.000	0.012	
433	520	30.750	29.500	310.000	6.000	0.012	
434	521	26.550	25.900	187.000	8.000	0.012	
435	522	27.120	26.650	164.000	10.000	0.012	
436	523	35.000	27.220	352.000	8.000	0.012	
437	524	37.410	35.100	340.000	8.000	0.012	
438	525	39.500	37.510	299.000	8.000	0.012	
439	526	26.650	26.650			0.012	
440	527	27.960	27.220	212.000	6.000	0.012	
441	528	28.660	28.060	200.000	6.000	0.012	
442	529	32.510	28.760	262.000	6.000	0.012	
443	530	33.810	32.610	260.000	6.000	0.012	
444	531	35.190	33.910	248.000	6.000	0.012	
445	532	37.100	35.290	312.000	6.000	0.012	
446	533	35.140	33.910	123.000	6.000	0.012	
447	534	33.340	32.610	146.000	6.000	0.012	
448	535	29.490	28.760	146.000	6.000	0.012	
449	536	29.480	28.060	185.000	6.000	0.012	
450	537	31.250	30.240	304.000	8.000	0.012	
451	538	31.870	31.350	164.000	8.000	0.012	
452	539	33.330	31.970	400.000	6.000	0.012	
453	540	37.230	33.430	345.000	6.000	0.012	
454	541	39.890	37.330	380.000	6.000	0.012	
455	542	39.250	37.330	260.000	6.000	0.012	
456	543	47.020	42.270	184.000	6.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM_INV (Num)	TO_INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
457	544	47.020	39.350	320.000	6.000	0.012	
458	545	42.170	36.980	178.000	6.000	0.012	
459	546	33.930	33.070	160.000	6.000	0.012	
460	547	32.970	31.970	224.000	8.000	0.012	
461	548	34.640	33.070	338.000	6.000	0.012	
462	549	36.950	34.740	346.000	6.000	0.012	
463	550	32.350	31.350	273.000	8.000	0.012	
464	551	33.830	32.450	400.000	8.000	0.012	
465	552	36.590	33.930	375.000	6.000	0.012	
466	553	31.280	31.340	285.000	10.000	0.012	
467	554	31.730	31.380	130.000	6.000	0.012	
468	555	32.740	31.830	266.000	8.000	0.012	
469	556	33.640	32.840	256.000	8.000	0.012	
470	557	35.200	30.920	140.000	6.000	0.012	
471	558	36.220	35.300	182.000	6.000	0.012	
472	559	34.690	33.921	277.000	8.000	0.012	
473	567	35.780	34.790	283.000	8.000	0.012	
474	568	36.880	35.880	288.000	8.000	0.012	
475	569	38.790	36.980	84.000	6.000	0.012	
476	570	36.440	35.880	84.000	6.000	0.012	
477	571	35.250	34.790	84.000	6.000	0.012	
478	572	36.590	33.909	84.000	6.000	0.012	
479	573	32.660	32.218	169.000	10.000	0.012	
480	574	33.010	32.760	99.000	10.000	0.012	
481	575	34.040	33.110	265.000	10.000	0.012	
482	576	35.100	34.140	304.000	10.000	0.012	
483	577	36.050	35.200	245.000	10.000	0.012	
484	578	36.780	36.150	205.000	10.000	0.012	
485	579	37.310	36.880	151.000	10.000	0.012	
486	580	37.970	37.410	188.000	10.000	0.012	
487	581	38.950	38.070	281.000	10.000	0.012	
488	582	40.260	39.050	373.000	10.000	0.012	
489	583	42.240	41.700	80.000	8.000	0.012	
490	585	43.800	41.700	67.000	8.000	0.012	
491	586	43.080	40.360	219.000	8.000	0.012	
492	587	44.200	43.180	92.000	8.000	0.012	
493	588	47.880	39.050	244.000	6.000	0.012	
494	589	47.650	39.050	221.000	6.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM_INV (Num)	TO_INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
495	590	45,540	38,070	298,000	6,000	0.012	
496	591	48,660	45,640	312,000	6,000	0.012	
497	592	58,000	48,760	302,000	6,000	0.012	
498	593	43,000	37,410	162,000	6,000	0.012	
499	594	42,700	36,880	344,000	8,000	0.012	
500	595	45,500	42,800	350,000	8,000	0.012	
501	596	54,400	45,600	236,000	8,000	0.012	
502	597	59,860	54,500	444,000	8,000	0.012	
503	598	61,920	59,960	400,000	8,000	0.012	
504	599		0,200			0.012	
505	600	38,630	29,980	355,000	6,000	0.012	
506	601	40,430	34,140		6,000	0.012	
507	602	44,430	39,050	400,000	6,000	0.012	
508	603	46,130	44,530	200,000	6,000	0.012	
509	604	49,530	46,230	233,000	6,000	0.012	
510	624	7,050	1,770	138,000	8,000	0.012	
511	625	14,240	7,150	437,000	6,000	0.012	
512	626	7,520	7,150	145,000	8,000	0.012	
513	627	13,280	7,620	335,000	6,000	0.012	
514	628	16,000	13,380	110,000	6,000	0.012	
515	629	7,790	7,620	140,000	8,000	0.012	
516	630	8,300	7,890	252,000	8,000	0.012	
517	631	6,790	6,890	10,000	6,000	0.012	
518	632	13,530	9,100	269,000	6,000	0.012	
519	633	17,600	13,630	330,000	6,000	0.012	
520	634	8,850	8,750	85,000	8,000	0.012	
521	635	8,650	7,890	330,000	8,000	0.012	
522	636	14,630	8,750	165,000	6,000	0.012	
523	637	15,990	8,400	347,000	6,000	0.012	
524	638	15,370	6,890	355,000	6,000	0.012	
525	639	11,020	13,630	333,000	6,000	0.012	
526	640	11,860	11,120	210,000	6,000	0.012	
527	641	9,800	8,950	360,000	8,000	0.012	
528	642	19,510	16,090	233,000	6,000	0.012	
529	643	14,600	9,900	310,000	6,000	0.012	
530	644	17,060	15,470	332,000	6,000	0.012	
531	645	14,980	11,120	333,000	6,000	0.012	
532	646	15,860	15,080	223,000	6,000	0.012	

PIPE INFORMATION

	ID (Char)	FROM_INV (Num)	TO_INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
533	647	17.450	15.960	317.000	6.000	0.012	
534	648	0.100	0.100	208.000	8.000	0.012	
535	649	0.100	0.100		8.000	0.012	
536	650	0.100	0.100		8.000	0.012	
537	651	0.100	0.100	208.000	8.000	0.012	
538	652	10.730	9.900	360.000	8.000	0.012	
539	653	18.130	17.160	227.000	6.000	0.012	
540	654	14.600	10.830	425.000	6.000	0.012	
541	655	18.940	15.080	342.000	8.000	0.012	
542	656	19.840	19.040	218.000	6.000	0.012	
543	657	11.660	10.830	368.000	6.000	0.012	
544	658	11.760	11.760			0.012	
545	659	12.620	11.760	365.000	8.000	0.012	
546	660	13.800	12.720	404.000	8.000	0.012	
547	661	13.900	13.900	262.000	6.000	0.012	
548	662	14.400	13.900	236.000	8.000	0.012	
549	663	14.500	14.500	288.000	8.000	0.012	
550	664	11.760	11.760	60.000	6.000	0.012	
551	665	14.870	0.100	350.000	6.000	0.012	
552	666	14.000	14.000	350.000	6.000	0.012	
553	667	10.110	8.770	382.000	8.000	0.012	
554	668	13.900	10.210	210.000	6.000	0.012	
555	669	16.200	14.000	232.000	6.000	0.012	
556	670	16.850	15.420	190.000	6.000	0.012	
557	671	15.320	13.770	342.000	6.000	0.012	
558	672	13.670	12.910	256.000	6.000	0.012	
559	673	16.070	13.770	255.000	6.000	0.012	
560	674	16.980	15.420	311.000	6.000	0.012	
561	675	15.000	10.210	324.000	6.000	0.012	
562	676	11.320	13.170	409.000	8.000	0.012	
563	677	12.810	11.420	423.000	6.000	0.012	
564	678	14.850	12.910	223.000	6.000	0.012	
565	679	20.400	18.120	455.000	6.000	0.012	
566	680	18.020	11.420	442.000	6.000	0.012	
567	681	17.140	15.230	360.000	6.000	0.012	
568	682	15.130	14.460	342.000	8.000	0.012	
569	683	14.360	13.900	250.000	8.000	0.012	
570	684	17.720	17.240	114.000	6.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM_INV (Num)	TO_INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
571		15.310	14.460	180.000	6.000	0.012	
572		16.290	15.410	196.000	6.000	0.012	
573		16.620	15.490	205.000	6.000	0.012	
574		15.390	14.460	257.000	6.000	0.012	
575		16.370	15.490	265.000	6.000	0.012	
576		15.640	15.230	246.000	8.000	0.012	
577		17.240	15.740	400.000	6.000	0.012	
578		17.700	17.340	114.000	6.000	0.012	
579		21.000	19.060	380.000	6.000	0.012	
580		18.960	17.020	395.000	6.000	0.012	
581		16.920	15.740	186.000	8.000	0.012	
582		18.100	17.020	308.000	8.000	0.012	
583		23.350	18.200	381.000	8.000	0.012	
584		13.800	13.520	198.000	8.000	0.012	
585		13.420	12.100	126.000	8.000	0.012	
586		25.010	24.480	133.000	6.000	0.012	
587		24.380	13.900	448.000	6.000	0.012	
588		20.700	20.700	150.000	6.000	0.012	
589		18.770	15.050	271.000	6.000	0.012	
590		14.950	13.630	342.000	6.000	0.012	
591		13.070	10.720	155.000	6.000	0.012	
592		10.620	6.890	322.000	6.000	0.012	
593		11.440	10.720	140.000	6.000	0.012	
594		5.520	5.520	326.000	15.000	0.012	
595		12.850	0.100	105.000	6.000	0.012	
596		14.140	7.890	330.000	6.000	0.012	
597		18.240	16.790	347.000	8.000	0.012	
598		16.690	15.750	208.000	8.000	0.012	
599		15.650	14.490	252.000	8.000	0.012	
600		16.320	15.750	72.000	8.000	0.012	
601		14.390	13.090	261.000	8.000	0.012	
602		12.990	12.580	82.000	8.000	0.012	
603		12.480	10.590	398.000	8.000	0.012	
604		10.490	9.770	145.000	8.000	0.012	
605		9.670	9.070	140.000	10.000	0.012	
606		8.970	7.880	115.000	10.000	0.012	
607		10.950	9.770	237.000	8.000	0.012	
608		11.950	11.050	182.000	8.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM INV (Num)	TO INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
609	739	13.320	12.060	252.000	8.000	0.012	
610	740	13.960	13.420	109.000	8.000	0.012	
611	741	14.560	13.420	227.000	8.000	0.012	
612	742	14.760	12.100	424.000	8.000	0.012	
613	743	15.750	14.860	175.000	8.000	0.012	
614	744	17.060	15.850	111.000	8.000	0.012	
615	745	17.060	16.790	176.000	8.000	0.012	
616	746	15.440	14.860	137.000	8.000	0.012	
617	747	16.340	15.540	150.000	8.000	0.012	
618	748	13.900	13.420	120.000	8.000	0.012	
619	749	14.560	14.060	123.000	8.000	0.012	
620	750	13.000	12.060	200.000	8.000	0.012	
621	751	12.000	10.590	217.000	8.000	0.012	
622	752	14.260	12.100	108.000	8.000	0.012	
623	753	18.550	17.160	139.000	8.000	0.012	
624	772	13.710	12.700	231.000	10.000	0.012	
625	773	14.310	13.810	228.000	10.000	0.012	
626	774	14.880	14.410	214.000	10.000	0.012	
627	775	15.540	14.980	256.000	10.000	0.012	
628	776	14.460	13.810	297.000	10.000	0.012	
629	777	15.260	14.560	94.000	10.000	0.012	
630	778	15.280	14.410	396.000	10.000	0.012	
631	779	16.150	15.380	396.000	10.000	0.012	
632	782	11.940	10.940	18.000	12.000	0.012	
633	783	12.800	12.040	345.000	10.000	0.012	
634	784	13.650	12.900	340.000	10.000	0.012	
635	785	14.470	13.750	315.000	10.000	0.012	
636	786	16.150	14.570	274.000	10.000	0.012	
637	787	16.630	16.250	192.000	10.000	0.012	
638	788	16.920	16.730	117.000	10.000	0.012	
639	789	18.620	13.500	86.000	6.000	0.012	
640	790	13.400	12.040	305.000	6.000	0.012	
641	791	15.970	13.500	414.000	6.000	0.012	
642	792	18.030	16.070	410.000	6.000	0.012	
643	793	18.220	14.570	367.000	6.000	0.012	
644	794	17.410	18.940	234.000	10.000	0.012	
645	795	18.070	17.510	223.000	10.000	0.012	
646	796	19.090	18.170	137.000	6.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM INV (Num)	TO INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
647	797	18.840	16.250	230.000	10.000	0.012	
648	798	18.420	18.940	249.000	6.000	0.012	
649	799	19.510	19.980	142.000	6.000	0.012	
650	800	18.740	17.810	257.000	8.000	0.012	
651	801	17.710	16.780	265.000	8.000	0.012	
652	802	16.680	15.450	200.000	8.000	0.012	
653	803	15.350	14.890	274.000	8.000	0.012	
654	804	14.790	13.910	251.000	8.000	0.012	
655	810	20.400	15.450	115.000	6.000	0.012	
656	811	21.700	20.500	109.000	6.000	0.012	
657	812	25.800	21.800	309.000	6.000	0.012	
658	813	23.710	21.800	181.000	6.000	0.012	
659	814	24.950	23.810	66.000	6.000	0.012	
660	815	22.490	21.820	126.000	6.000	0.012	
661	816	21.720	19.980	295.000	6.000	0.012	
662	817	22.540	21.820	144.000	6.000	0.012	
663	818	19.880	18.850	297.000	8.000	0.012	
664	819	20.790	19.980	230.000	8.000	0.012	
665	820	21.100	20.890	212.000	8.000	0.012	
666	821	22.720	21.200	224.000	8.000	0.012	
667	822	23.420	22.820	157.000	8.000	0.012	
668	823	24.220	23.520	194.000	8.000	0.012	
669	824	25.320	24.320	149.000	6.000	0.012	
670	825	25.580	25.420	164.000	6.000	0.012	
671	826	26.120	25.580	238.000	6.000	0.012	
672	827	26.180	25.660	71.000	6.000	0.012	
673	828	25.480	24.320	197.000	6.000	0.012	
674	829	26.590	25.580	203.000	6.000	0.012	
675	830	24.210	22.820	263.000	6.000	0.012	
676	831	24.890	21.200	256.000	8.000	0.012	
677	832	24.990	24.990		8.000	0.012	
678	833	23.370	21.200	293.000	8.000	0.012	
679	834	24.200	23.470	230.000	8.000	0.012	
680	835	23.650	23.470	151.000	8.000	0.012	
681	836	16.760	18.170	234.000	10.000	0.012	
682	837	19.760	16.860	236.000	8.000	0.012	
683	838	19.640	16.860	201.000	8.000	0.012	
684	839	20.430	19.740	126.000	6.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM INV (Num)	TO INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
685	840	21.440	19.860	304.000	6.000	0.012	
686	841	20.750	19.750	236.000	8.000	0.012	
687	842	19.650	16.860	356.000	10.000	0.012	
688	843	20.400	19.750	260.000	10.000	0.012	
689	844	21.050	20.500	260.000	10.000	0.012	
690	845	21.500	21.150	180.000	10.000	0.012	
691	847	19.940	19.940	314.000	5.000	0.012	
692	848	17.240	15.740	400.000	6.000	0.012	
693	849	13.520	13.520	100.000	8.000	0.012	
694	850	-0.280	-1.680	300.000	8.000	0.012	
695	851	-1.780	-2.900	245.000	8.000	0.012	
696	852	-3.000	-2.800	3,265.000	4.000	0.012	
697	855	21.400	21.370	60.000	12.000	0.012	
698	856	21.750	21.500	160.000	12.000	0.012	
699	857	22.390	21.850	290.000	12.000	0.012	
700	882	14.500	12.340	463.000	8.000	0.012	
701	884	16.500	12.340	140.000	8.000	0.012	
702	885	20.500	18.170	550.000	4.000	130.000	
703	900	20.000	16.100	284.000	8.000	0.012	
704	901	21.000	20.100	365.000	8.000	0.012	
705	902	22.000	21.100	276.000	8.000	0.012	
706	903	23.000	23.200	273.000	8.000	0.012	
707	904	19.000	16.100	287.000	8.000	0.012	
708	905	22.000	19.100	293.000	8.000	0.012	
709	908	18.340	16.100	146.000	8.000	0.012	
710	913	3.810	1.560	247.000	10.000	0.012	
711	914	3.380	3.910	315.000	8.000	0.012	
712	915	4.360	-0.430	250.000	8.000	0.012	
713	916	5.790	-0.380	260.000	6.000	0.012	
714	917	0.030	-1.310	140.000	8.000	0.012	
715	918	0.980	0.130	256.000	8.000	0.012	
716	919	1.880	1.080	270.000	8.000	0.012	
717	920	2.610	1.980	210.000	8.000	0.012	
718	921	3.380	2.710	219.000	8.000	0.012	
719	922	6.040	6.140	461.000	8.000	0.012	
720	923	6.040	5.530	215.000	8.000	0.012	
721	924	5.430	4.570	244.000	8.000	0.012	
722	925	4.470	2.710	494.000	8.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM_INV (Num)	TO_INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
723	926	4.000	1.980	390.000	6.000	0.012	
724	928	2.970	1.080	373.000	6.000	0.012	
725	929	4.090	0.130	324.000	6.000	0.012	
726	930	1.070	0.130	269.000	8.000	0.012	
727	931	1.880	1.170	230.000	8.000	0.012	
728	932	3.250	1.980	392.000	8.000	0.012	
729	933	3.860	3.350	87.000	6.000	0.012	
730	934	1.930	1.080	258.000	8.000	0.012	
731	935	2.990	2.030	302.000	8.000	0.012	
732	936	4.100	3.090	316.000	8.000	0.012	
733	937	4.550	3.090	278.000	6.000	0.012	
734	938	3.430	2.030	265.000	6.000	0.012	
735	939	2.360	0.840	262.000	8.000	0.012	
736	940	3.110	2.460	260.000	8.000	0.012	
737	941	3.750	3.210	125.000	6.000	0.012	
738	942	4.420	2.460	373.000	8.000	0.012	
739	943	5.450	4.520	266.000	8.000	0.012	
740	944	5.560	4.580	251.000	8.000	0.012	
741	945	5.560	5.550	66.000	8.000	0.012	
742	946	4.580	3.660	263.000	8.000	0.012	
743	947	3.560	3.150	192.000	8.000	0.012	
744	948	4.780	3.660	210.000	6.000	0.012	
745	949	3.050	2.460	284.000		0.012	
746	950	3.970	3.150	75.000	6.000	0.012	
747	951	2.440	1.560	251.000	8.000	0.012	
748	952	3.250	2.540	232.000	8.000	0.012	
749	953	4.270	3.350	264.000	8.000	0.012	
750	954	5.500	4.370	184.000	6.000	0.012	
751	955	4.370	4.370	244.000	6.000	0.012	
752	956	4.990	2.930	412.000	8.000	0.012	
753	957	2.830	3.910	220.000	10.000	0.012	
754	958	1.760	0.840	145.000	8.000	0.012	
755	959	3.460	1.860	160.000	6.000	0.012	
756	960	5.000	3.560	160.000	6.000	0.012	
757	961	3.980	3.480	112.000	6.000	0.012	
758	962	6.230	4.460	353.000	6.000	0.012	
759	963	5.420	0.230	85.000	6.000	0.012	
760	964	3.260	1.860	340.000	8.000	0.012	

PIPE INFORMATION

	ID (Chart)	FROM INV (Num)	TO INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
761		4.990	3.360	466.000	8.000	0.012	
762		5.840	5.090	136.000	6.000	0.012	
763		5.480	5.090	64.000	6.000	0.012	
764		-1.800	-3.510	299.000	8.000	0.012	
765		-1.010	-1.700	241.000	8.000	0.012	
766		-0.110	-0.910	256.000	8.000	0.012	
767		1.030	-0.010	297.000	8.000	0.012	
768		2.600	1.130	287.000	6.000	0.012	
769		0.010	-0.910	262.000	8.000	0.012	
770		0.900	0.110	14.000	6.000	0.012	
771		1.200	1.000	40.000	6.000	0.012	
772		1.300	0.970	253.000	8.000	0.012	
773		-1.430	-2.420	138.000	8.000	0.012	
774		-0.080	-1.330	388.000	8.000	0.012	
775		0.820	0.020	256.000	8.000	0.012	
776		2.520	0.920	457.000	6.000	0.012	
777		1.800	0.920	162.000	6.000	0.012	
778		0.870	0.020	244.000	8.000	0.012	
779		1.480	0.970	163.000	8.000	0.012	
780		2.100	1.580	177.000	8.000	0.012	
781		3.160	2.200	310.000	6.000	0.012	
782		-1.460	-1.790	84.000	10.000	0.012	
783		1.660	-1.360	132.000	8.000	0.012	
784		3.500	1.760	416.000	8.000	0.012	
785		3.860	3.600	159.000	8.000	0.012	
786		2.170	-1.360	273.000	8.000	0.012	
787		2.530	2.270	42.000	8.000	0.012	
788		3.040	2.630	90.000	8.000	0.012	
789		3.880	3.140	182.000	8.000	0.012	
790		3.240	3.980	57.000	8.000	0.012	
791		3.260	2.630	138.000	8.000	0.012	
792		4.130	3.340	192.000	8.000	0.012	
793		3.940	3.360	137.000	8.000	0.012	
794		4.970	4.040	239.000	8.000	0.012	
795		4.780	4.040	125.000	8.000	0.012	
796		5.570	4.880	217.000	8.000	0.012	
797		0.540	-0.430	264.000	8.000	0.012	
798		2.900	0.640	292.000	8.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM INV (Num)	TO INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
799	1011	0.050	0.640	140.000	8.000	0.012	
800	1012	3.300	0.150	369.000	8.000	0.012	
801	1013	4.000	3.400	201.000	8.000	0.012	
802	1014	0.400	0.150	128.000	8.000	0.012	
803	1015	5.220	0.500	80.000	8.000	0.012	
804	1016	-0.300	5.320	50.000	8.000	0.012	
805	1017	0.680	0.500	80.000	8.000	0.012	
806	1018	0.150	-0.430	113.000	8.000	0.012	
807	1019	0.710	0.250	132.000	8.000	0.012	
808	1020	0.960	0.250	65.000	8.000	0.012	
809	1021	5.100	0.810	167.000	8.000	0.012	
810	1022	5.800	5.200	128.000	8.000	0.012	
811	1023	2.130	1.280	271.000	8.000	0.012	
812	1024	3.750	3.010	182.000	8.000	0.012	
813	1025	4.440	3.850	140.000	8.000	0.012	
814	1026	6.460	4.540	148.000	8.000	0.012	
815	1027	5.110	4.540	134.000	8.000	0.012	
816	1028	6.050	5.210	210.000	8.000	0.012	
817	1029	4.620	0.250	143.000	8.000	0.012	
818	1030	6.700	4.720	337.000	8.000	0.012	
819	1031	5.070	4.720	129.000	8.000	0.012	
820	1032	8.000	5.170	216.000	8.000	0.012	
821	1033	8.800	8.100	64.000	8.000	0.012	
822	1034	10.300	8.900	237.000	8.000	0.012	
823	1035	8.300	5.170	88.000	8.000	0.012	
824	1036	6.850	3.360	132.000	8.000	0.012	
825	1037	12.000	6.950	241.000	8.000	0.012	
826	1038	10.500	5.940	222.000	8.000	0.012	
827	1039	5.840	2.230	198.000	8.000	0.012	
828	1040	0.100	0.100		24.000	0.012	
829	1053	7.750	6.410	254.000	8.000	0.012	
830	1054	9.140	7.850	257.000	8.000	0.012	
831	1055	9.120	7.850	317.000	10.000	0.012	
832	1056	10.090	9.220	276.000	10.000	0.012	
833	1057	11.490	10.190	399.000	10.000	0.012	
834	1058	10.800	11.590	184.000	8.000	0.012	
835	1065	8.350	7.730	287.000	10.000	0.012	
836	1068	8.830	8.450	249.000	8.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM_INV (Num)	TO_INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
837	1069	8.930	8.930	66.000	6.000	0.012	
838	1070	9.750	8.930	252.000	8.000	0.012	
839	1071	10.830	9.850	335.000	8.000	0.012	
840	1072	10.570	9.850	252.000	8.000	0.012	
841	1073	11.830	10.670	334.000	8.000	0.012	
842	1074	11.180	10.670	174.000	8.000	0.012	
843	1075	10.220	9.120	173.000	15.000	0.012	
844	1076	8.650	10.320	390.000	8.000	0.012	
845	1077	11.130	8.750	72.000	6.000	0.012	
846	1078	9.560	8.750	260.000	8.000	0.012	
847	1079	10.460	9.660	179.000	6.000	0.012	
848	1080	9.060	9.660	168.000	8.000	0.012	
849	1081	14.110	9.160	238.000	6.000	0.012	
850	1082	17.340	16.370	97.000	6.000	0.012	
851	1083	16.270	14.210	255.000	6.000	0.012	
852	1084	4.590	4.040	105.000	6.000	0.012	
853	1085	18.090	16.370	343.000		0.012	
854	1086	17.330	14.210	297.000		0.012	
855	1087	22.330	17.430	89.000		0.012	
856	1088	16.370	14.210	247.000	8.000	0.012	
857	1089	21.660	16.450	317.000	6.000	0.012	
858	1090	8.800	7.400	260.000	8.000	0.012	
859	1091	16.500	8.900	323.000	8.000	0.012	
860	1092	7.300	5.450	255.000	8.000	0.012	
861	1093	16.070	7.400	311.000	8.000	0.012	
862	1094	10.220	10.320	40.000	8.000	0.012	
863	1095	11.760	10.320	375.000	8.000	0.012	
864	1096	13.140	11.860	402.000	8.000	0.012	
865	1097	14.250	13.240	316.000	8.000	0.012	
866	1098	10.250	10.320	266.000	10.000	0.012	
867	1099	10.910	10.350	140.000	8.000	0.012	
868	1100	15.700	11.010	149.000	8.000	0.012	
869	1102	17.980	17.980	400.000	8.000	0.012	
870	1104	11.420	11.010	253.000	8.000	0.012	
871	1105	15.060	11.520	397.000	8.000	0.012	
872	1106	16.280	15.160	404.000	8.000	0.012	
873	1107	12.370	11.520	334.000	8.000	0.012	
874	1108	14.640	12.470	344.000	8.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM INV (Num)	TO INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
875	1109	17.000	14.740	330.000	8.000	0.012	
876	1110	13.330	12.470	236.000	8.000	0.012	
877	1111	14.550	13.430	343.000	8.000	0.012	
878	1112	15.300	14.650	250.000	8.000	0.012	
879	1113	14.750	13.430	236.000	8.000	0.012	
880	1114	18.000	14.850	276.000	8.000	0.012	
881	1115	16.350	8.900	260.000	8.000	0.012	
882	1131	4.170	3.200	276.000	8.000	0.012	
883	1133	4.080	5.900	413.000	8.000	0.012	
884	1134	4.600	4.180	148.000	8.000	0.012	
885	1135	5.370	4.700	221.000	8.000	0.012	
886	1136	6.660	7.120	369.000	8.000	0.012	
887	1137	7.020	7.120	106.000	8.000	0.012	
888	1138	3.100	2.080	10.000	8.000	0.012	
889	1139	3.890	3.200	253.000	8.000	0.012	
890	1140	4.980	3.990	246.000	8.000	0.012	
891	1141	5.690	5.080	490.000	8.000	0.012	
892	1143	3.540	3.540	341.000	8.000	0.012	
893	1144	5.210	-2.450	451.000	8.000	0.012	
894	1145	1.170	-0.300	42.000	8.000	0.012	
895	1146	1.830	1.270	188.000	8.000	0.012	
896	1147	2.330	1.930	144.000	8.000	0.012	
897	1148	2.920	2.430	98.000	8.000	0.012	
898	1149	-0.400	-1.430	295.000	8.000	0.012	
899	1150	0.220	-0.300	148.000	8.000	0.012	
900	1151	0.070	0.320	153.000	8.000	0.012	
901	1152	2.030	0.170	338.000	8.000	0.012	
902	1153	2.940	2.130	259.000	8.000	0.012	
903	1154	4.560	3.040	303.000	8.000	0.012	
904	1155	-1.530	-1.790	73.000	8.000	0.012	
905	1156	-0.690	-1.430	188.000	8.000	0.012	
906	1157	-0.300	-0.590	83.000	8.000	0.012	
907	1158	0.400	-0.200	172.000	8.000	0.012	
908	1159	1.180	0.500	222.000	8.000	0.012	
909	1160	2.480	1.280	370.000	8.000	0.012	
910	1161	3.060	3.160	165.000	8.000	0.012	
911	1162	4.250	3.430	264.000	8.000	0.012	
912	1163	4.250	3.160	202.000	8.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM INV (Num)	TO INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
913	1164	3.330	2.100	380.000	8.000	0.012	
914	1165	2.000	0.730	362.000	8.000	0.012	
915	1166	0.630	-0.200	238.000	8.000	0.012	
916	1167	1.630	0.730	286.000	8.000	0.012	
917	1168	2.750	1.730	309.000	8.000	0.012	
918	1169	3.670	2.850	161.000	8.000	0.012	
919	1170	3.520	2.850	219.000	8.000	0.012	
920	1171	4.440	4.350	286.000	8.000	0.012	
921	1172	4.440	3.430	286.000	8.000	0.012	
922	1173	-1.890	4.060	357.000	8.000	0.012	
923	1175	3.040	-3.070	182.000	15.000	0.012	
924	1176	2.030	-3.070	397.000		0.012	
926	1179	0.530	-2.050	294.000		0.012	
926	1182	-0.120	-1.546	244.000	8.000	0.012	
927	1183	0.780	-0.020	287.000	8.000	0.012	
928	1184	1.580	0.880	211.000	8.000	0.012	
929	1185	2.200	1.680	166.000	8.000	0.012	
930	1186	4.470	2.300	105.000	6.000	0.012	
931	1187	3.060	2.300	247.000	8.000	0.012	
932	1188	4.100	3.160	173.000	6.000	0.012	
933	1189	1.950	0.880	180.000	6.000	0.012	
934	1190	4.000	0.880	293.000	6.000	0.012	
935	1191	0.860	-0.020	281.000	8.000	0.012	
936	1192	1.760	0.960	256.000	8.000	0.012	
937	1193	3.940	1.860	38.000	6.000	0.012	
938	1197	1.690	1.690	3,410.000	14.000	0.012	
939	1198	2.710	0.100	50.000	10.000	0.012	
940	1199	3.400	2.810	169.000	10.000	0.012	
941	1200	9.210	3.500	315.000	10.000	0.012	
942	1201	10.500	9.310	368.000	10.000	0.012	
943	1202	11.340	10.600	239.000	10.000	0.012	
944	1203	19.610	11.440	255.000	8.000	0.012	
945	1204	5.070	3.500	476.000	10.000	0.012	
946	1205	5.350	5.170	80.000	10.000	0.012	
947	1206	13.360	5.450	316.000	8.000	0.012	
948	1208	7.750	6.410	254.000	10.000	0.012	
949	1209	1.180	0.250	187.000	8.000	0.012	
950	1210	2.910	2.230	165.000	8.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM_INV (Num)	TO_INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
951	1211	0.000	0.200		21.000	0.012	
952	1212	-2.000	0.100		21.000	0.012	
953	1213	-1.900	-1.900	400.000	21.000	0.012	
954	1223	3.000	1.770	308.000	8.000	0.012	
955	1224	3.000	3.100	300.000	8.000	0.012	
956	1225	4.000	3.100	29.000	8.000	0.012	
957	1226	2.000	4.100	60.000	8.000	0.012	
958	1227	3.000	4.100	260.000	8.000	0.012	
959	1228	4.000	3.100	300.000	8.000	0.012	
960	1229	4.000	4.100	117.000	8.000	0.012	
961	1230	5.000	4.100	256.000	8.000	0.012	
962	1231	5.000	1.330	379.000	8.000	0.012	
963	1232	8.000	5.100	152.000	8.000	0.012	
964	1233	6.000	5.100	266.000	8.000	0.012	
965	1234	6.000	5.766	124.000	8.000	0.012	
966	1235	11.000	6.100	227.000	8.000	0.012	
967	1236	7.000	3.100	358.000	8.000	0.012	
968	1237	4.000	2.100	126.000	8.000	0.012	
969	1238	3.000	0.980	35.000	8.000	0.012	
970	1239	2.000	0.272	195.000	8.000	0.012	
971	1240	3.000	2.100	286.000	8.000	0.012	
972	1241	4.000	3.100	293.000	8.000	0.012	
973	1242	5.000	4.100	169.000	8.000	0.012	
974	1243	1.000	5.100	225.000	21.000	0.012	
975	1245	3.000	1.620	240.000	8.000	0.012	
976	1246	2.000	1.100	10.000	10.000	0.012	
977	1247	4.000	2.100	126.000	8.000	0.012	
978	1248	3.000	4.100	136.000	8.000	0.012	
979	1249	4.000	3.100	148.000	8.000	0.012	
980	1250	5.000	4.100	130.000	8.000	0.012	
981	1251	6.000	5.100	32.000	8.000	0.012	
982	1252	6.000	5.100	55.000	8.000	0.012	
983	1307	18.270	16.740	200.000	8.000	0.012	
984	1308	19.760	18.370	262.000	8.000	0.012	
985	1309	20.900	19.860	245.000	8.000	0.012	
986	1310	21.850	21.000	95.000	8.000	0.012	
987	1311	25.830	21.950	246.000	8.000	0.012	
988	1312	23.480	18.370	323.000	8.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM INV (Num)	TO INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
989	1313	22.980	19.860	322.000	8.000	0.012	
990	1314	21.580	20.930	167.000	8.000	0.012	
991	1315	23.880	21.680	476.000	8.000	0.012	
992	1316	22.050	21.680	252.000	8.000	0.012	
993	1317	28.520	22.150	495.000	8.000	0.012	
994	1318	22.950	22.150	80.000	8.000	0.012	
995	1332	22.430	20.160	340.000	12.000	0.012	
996	1333	24.260	22.530	302.000	12.000	0.012	
997	1334	27.970	24.360	449.000	8.000	0.012	
998	1335	29.060	28.070	205.000	8.000	0.012	
999	1336	38.280	29.160	304.000	8.000	0.012	
1000	1337	32.000	29.160	306.000	6.000	0.012	
1001	1338	33.370	29.160	238.000	8.000	0.012	
1002	1339	34.100	33.470	327.000	8.000	0.012	
1003	1340	34.450	34.200	95.000	8.000	0.012	
1004	1341	35.250	34.200	184.000	8.000	0.012	
1005	1342	37.320	35.350	116.000	8.000	0.012	
1006	1343	32.330	33.470	377.000	8.000	0.012	
1007	1344	27.960	24.360	113.000	8.000	0.012	
1008	1345	31.710	28.060	279.000	8.000	0.012	
1009	1346	32.730	31.810	196.000	8.000	0.012	
1010	1347	35.140	32.830	230.000	8.000	0.012	
1011	1348	36.480	35.240	134.000	8.000	0.012	
1012	1349	38.190	36.580	342.000	8.000	0.012	
1013	1350	39.000	38.290	162.000	8.000	0.012	
1014	1351	32.380	28.060	471.000	8.000	0.012	
1015	1352	40.260	32.480	195.000	8.000	0.012	
1016	1353	30.200	24.360	276.000	8.000	0.012	
1017	1354	31.640	22.530	280.000	8.000	0.012	
1018	1355	31.640	27.000	226.000	8.000	0.012	
1019	1356	26.900	23.550	248.000	8.000	0.012	
1020	1357	28.600	27.000	191.000	8.000	0.012	
1021	1358	23.450	20.300	200.000	8.000	0.012	
1022	1359	32.000	23.550	306.000	8.000	0.012	
1023	1360	20.200	19.330	384.000	8.000	0.012	
1024	1361	21.380	20.300	235.000	8.000	0.012	
1025	1362	23.510	21.480	152.000	8.000	0.012	
1026	1363	24.420	19.330	221.000	8.000	0.012	

PIPE INFORMATION

	ID (Chart)	FROM INV (Num)	TO INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
1027	1364	27.450	24.520	164.000	8.000	0.012	
1028	1365	31.300	24.520	259.000	8.000	0.012	
1029	1366	32.830	31.400	98.000	8.000	0.012	
1030	1367	38.320	31.400	102.000	8.000	0.012	
1031	1368	38.130	20.160	337.000	8.000	0.012	
1032	1369	40.960	38.170	132.000	8.000	0.012	
1033	1370	41.590	41.060	106.000	8.000	0.012	
1034	1371	42.230	38.790	177.000	8.000	0.012	
1035	1372	43.350	42.330	150.000	8.000	0.012	
1036	1373	42.440	39.470	177.000	8.000	0.012	
1037	1374	43.000	40.030	177.000	8.000	0.012	
1038	1375	43.350	45.090	150.000	8.000	0.012	
1039	1376	43.450	43.450	200.000	8.000	0.012	
1040	1381	54.240	54.240	205.000	8.000	0.012	
1041	1382	56.850	55.070	336.000	8.000	0.012	
1042	1383	58.070	56.950	243.000	8.000	0.012	
1043	1384	74.730	58.170	133.000	8.000	0.012	
1044	1385	59.710	58.170	289.000	8.000	0.012	
1045	1386	63.790	59.810	259.000	8.000	0.012	
1046	1387	61.800	59.810	377.000	8.000	0.012	
1047	1388	65.630	61.900	343.000	8.000	0.012	
1048	1389	62.660	61.900	132.000	8.000	0.012	
1049	1390	65.090	62.760	485.000	8.000	0.012	
1050	1391	67.310	65.190	445.000	8.000	0.012	
1051	1392	76.800	55.070	353.000	8.000	0.012	
1052	1393	78.870	76.900	200.000	8.000	0.012	
1053	1394	79.340	67.410	114.000	8.000	0.012	
1054	1398		0.200			0.012	
1055	1399	53.300	52.750	157.000	8.000	0.012	
1056	1403	52.650	51.600	300.000	8.000	0.012	
1057	1404	51.500	50.010	418.000	8.000	0.012	
1058	1405	58.600	51.600	252.000	8.000	0.012	
1059	1406	62.900	58.700	314.000	8.000	0.012	
1060	1407	65.480	63.000	260.000	8.000	0.012	
1061	1408	70.900	65.580	178.000	8.000	0.012	
1062	1409	72.320	71.000	189.000	8.000	0.012	
1063	1410						
1064	1411	65.080	64.010	152.000	8.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM INV (Num)	TO INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
1065	1412	63.910	63.000	130.000	8.000	0.012	
1066	1413	60.680	58.700	282.000	8.000	0.012	
1067	1414	53.450	52.750	200.000	8.000	0.012	
1068	1415	49.910	49.090	262.000	8.000	0.012	
1069	1416	48.990	48.060	266.000	8.000	0.012	
1070	1417	58.690	49.090	347.000	8.000	0.012	
1071	1418	61.090	58.790	120.000	8.000	0.012	
1072	1419	59.530	58.790	93.000	8.000	0.012	
1073	1422	48.580	48.060	324.000	8.000	0.012	
1074	1423	50.560	48.680	175.000	8.000	0.012	
1075	1425	45.530	44.920	95.000	8.000	0.012	
1076	1426	45.530	44.920	107.000	8.000	0.012	
1077	1427	46.470	45.630	269.000	8.000	0.012	
1078	1428	47.180	45.630	202.000	8.000	0.012	
1079	1429	48.280	46.570	200.000	8.000	0.012	
1080	1430	49.590	47.280	241.000	8.000	0.012	
1081	1431	50.040	48.380	71.000	8.000	0.012	
1082	1432	50.680	49.690	128.000	8.000	0.012	
1083	1433	40.680	0.100	170.000	8.000	0.012	
1084	1434	46.480	50.780	310.000	8.000	0.012	
1085	1440	-8.500	-9.900	211.000	4.000	0.012	
1086	1441	-9.000	-9.020	88.000	8.000	0.012	
1087	1442	-9.120	0.100	300.000	12.000	0.012	
1088	1450	-7.940	-12.060	330.000	8.000	0.012	
1089	1451	-6.670	-7.840	330.000	8.000	0.012	
1090	1452	-15.440	0.100	182.000	8.000	0.012	
1091	1453	-14.980	-15.340	152.000	8.000	0.012	
1092	1454	-14.240	-14.880	244.000	8.000	0.012	
1093	1455	-13.620	-14.140	198.000	8.000	0.012	
1094	1456	-12.340	-13.520	397.000	8.000	0.012	
1095	1457	-11.150	-12.240	400.000	8.000	0.012	
1096	1458	-9.950	-11.050	420.000	8.000	0.012	
1097	1459	-9.420	-9.850	190.000	8.000	0.012	
1098	1460	-10.030	-10.730	316.000	8.000	0.012	
1099	1461	-10.830	-11.940	192.000	8.000	0.012	
1100	1462	-12.040	-13.140	302.000	8.000	0.012	
1101	1463	-13.240	-14.680	385.000	8.000	0.012	
1102	1464	-14.780	-15.520	222.000	8.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM_INV (Num)	TO_INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
1103	1465	-15.620	-16.420	214.000	8.000	0.012	
1104	1466	-16.520	0.100	271.000	8.000	0.012	
1105	1467	-9.320	-9.320	1,975.000	8.000	0.012	
1106	1468	-16.570	0.100	343.000	8.000	0.012	
1107	1469	-15.430	-16.470	400.000	8.000	0.012	
1108	1470	-14.570	-15.330	318.000	8.000	0.012	
1109	1471	-13.470	-14.470	371.000	8.000	0.012	
1110	1472	-12.440	-13.370	334.000	8.000	0.012	
1111	1474	-11.470	-12.340	330.000	8.000	0.012	
1112	1475	-10.800	-11.370	261.000	8.000	0.012	
1113	1476	-9.580	-10.700	375.000	8.000	0.012	
1114	1477	-8.820	-9.480	247.000	8.000	0.012	
1115	1478	-7.920	-8.720	287.000	8.000	0.012	
1116	1479	-9.120	-9.970	237.000	8.000	0.012	
1117	1480	-10.070	-10.870	219.000	8.000	0.012	
1118	1481	-10.970	-11.580	199.000	8.000	0.012	
1119	1482	-11.680	-12.400	192.000	8.000	0.012	
1120	1483	-12.500	0.100	330.000	8.000	0.012	
1121	1484	-13.530	-13.530	190.000	8.000	0.012	
1122	1485	-13.630	-14.490	180.000	8.000	0.012	
1123	1486	-14.590	-15.460	248.000	8.000	0.012	
1124	1487	-15.560	-16.730	270.000	8.000	0.012	
1125	1488	-16.830	-17.410	221.000	8.000	0.012	
1126	1489	-17.510	-18.830	193.000	8.000	0.012	
1127	1490	-18.930	-7.820	2,475.000	6.000	0.012	
1128	1491	-18.360	-18.830	105.000	8.000	0.012	
1129	1492	-17.650	-18.260	325.000	8.000	0.012	
1130	1493	-16.940	-17.550	236.000	8.000	0.012	
1131	1494	-16.240	-16.840	291.000	8.000	0.012	
1132	1495	-15.450	-16.140	215.000	8.000	0.012	
1133	1496	-14.650	-15.350	303.000	8.000	0.012	
1134	1497	-13.550	-14.550	314.000	8.000	0.012	
1135	1498	-18.790	-13.450	15.000		0.012	
1136	1499	-17.590	-18.690	417.000	8.000	0.012	
1137	1500	-17.190	-17.490	101.000	8.000	0.012	
1138	1501	-16.440	-17.090	202.000	8.000	0.012	
1139	1502		0.100	415.000	8.000	0.012	
1140	1503	-15.330	-16.340	311.000	8.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM INV (Num)	TO INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
1141	1504	-14.350	-15.230			0.012	
1142	1507	-16.840	0.100	350.000	8.000	0.012	
1143	1508	-16.560	-16.740	117.000	8.000	0.012	
1144	1509	-16.250	-16.460	105.000	8.000	0.012	
1145	1510	-16.150	-16.150	300.000	8.000	0.012	
1146	1511	-15.830	0.100	173.000	8.000	0.012	
1147	1512	-14.780	-15.730	329.000	8.000	0.012	
1148	1513	-13.640	-14.680	392.000	8.000	0.012	
1149	1514	-12.470	-13.540	290.000	8.000	0.012	
1150	1515	-11.540	-12.370	397.000	8.000	0.012	
1151	1516	-10.340	-11.440	396.000	8.000	0.012	
1152	1517	-9.220	-10.240	412.000	8.000	0.012	
1153	1518	-8.250	-9.120	337.000	8.000	0.012	
1154	1519	-7.510	-14.880	192.000	8.000	0.012	
1155	1520	-8.010	-9.420	381.000	8.000	0.012	
1156	1521	-9.520	-11.020	398.000	8.000	0.012	
1157	1522	-11.120	-11.410	96.000	8.000	0.012	
1158	1523	-11.510	-12.880	369.000	8.000	0.012	
1159	1524	-12.980	-7.410	1,235.000	6.000	0.012	
1160	1525	-12.100	-12.880	288.000	8.000	0.012	
1161	1526	-11.300	-12.000	311.000	8.000	0.012	
1162	1527	-10.400	-11.200	283.000	8.000	0.012	
1163	1528	-9.640	-10.300	249.000	8.000	0.012	
1164	1529	-9.210	-9.540	138.000	8.000	0.012	
1165	1530	-8.940	-9.110	106.000	8.000	0.012	
1166	1531	-8.230	-8.840	216.000	8.000	0.012	
1167	1532	-8.140	-9.120	278.000	8.000	0.012	
1168	1533	-9.220	-10.520	338.000	8.000	0.012	
1169	1534	-10.620	-11.940	356.000	8.000	0.012	
1170	1535	-12.040	-6.910	249.000	8.000	0.012	
1171	1536	-6.010	-11.940	280.000	8.000	0.012	
1172	1537	-13.060	-13.960	249.000	8.000	0.012	
1173	1538	-14.060	-12.960	237.000	8.000	0.012	
1174	1539	-15.000	-13.960	25.000	8.000	0.012	
1175	1540	-16.000	-14.900	245.000	8.000	0.012	
1176	1541	-17.480	-8.130	2,710.000	6.000	0.012	
1177	1542	-16.530	-17.380	235.000	8.000	0.012	
1178	1543	-15.620	-16.430	225.000	8.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM INV (Num)	TO INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
1179	1544	-14.080	-15.520	382.000	8.000	0.012	
1180	1545	-12.720	-13.980	334.000	8.000	0.012	
1181	1546	-11.600	-12.620	259.000	8.000	0.012	
1182	1547	-10.500	-11.500	305.000	8.000	0.012	
1183	1548	-10.760	-11.670	168.000	8.000	0.012	
1184	1549	-11.770	-12.370	410.000	8.000	0.012	
1185	1550	-12.470	-13.350	317.000	8.000	0.012	
1186	1551	-13.450	-14.550	398.000	8.000	0.012	
1187	1552	-14.650	-8.300	393.000	8.000	0.012	
1188	1556	-15.360	-8.300	377.000	8.000	0.012	
1189	1557	-14.220	-15.260	382.000	8.000	0.012	
1190	1558	-13.080	-14.120	379.000	8.000	0.012	
1191	1559	-11.960	-12.980	379.000	8.000	0.012	
1192	1560	-11.200	-11.860	212.000	8.000	0.012	
1193	1561	-14.100	-15.200	397.000	8.000	0.012	
1194	1562	-15.300	-16.400	381.000	8.000	0.012	
1195	1563	-16.500	-17.580	413.000	8.000	0.012	
1196	1564	-17.680	-12.900	280.000	8.000	0.012	
1197	1565	-13.000	-1.100	1,800.000	4.000	0.012	
1198	1566	-18.140	-12.900	95.000	8.000	0.012	
1199	1567	-17.400	-18.040	182.000	8.000	0.012	
1200	1568	-16.380	-17.300	246.000	8.000	0.012	
1201	1569	-15.610	-16.280	266.000	8.000	0.012	
1202	1570	-14.620	-15.510	339.000	8.000	0.012	
1203	1571	-13.640	-14.520	146.000	8.000	0.012	
1204	1572	-12.890	-13.540	235.000	8.000	0.012	
1205	1573	-12.220	-12.790	222.000	8.000	0.012	
1206	1574	-11.320	-12.120	306.000	8.000	0.012	
1207	1575	-10.850	-11.220	128.000	8.000	0.012	
1208	1579	-18.860	-18.660	550.000	4.000	0.012	
1209	1580	-18.000	-18.760	255.000	8.000	0.012	
1210	1581	-17.310	-17.900	230.000	8.000	0.012	
1211	1582	-16.400	-17.210	307.000	8.000	0.012	
1212	1583	-15.470	-16.300	307.000	8.000	0.012	
1213	1584	-14.330	-15.370	316.000	8.000	0.012	
1214	1585	-13.850	-14.230	215.000	8.000	0.012	
1215	1586	-13.130	-13.750	245.000	8.000	0.012	
1216	1587	-12.420	-13.030	229.000	8.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM INV (Num)	TO INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
1217	1588	-11.630	-12.320	271.000	8.000	0.012	
1218	1589	-10.630	-11.530	235.000	8.000	0.012	
1219	1590	-9.630	-10.460	262.000	8.000	0.012	
1220	1591	-10.560	-12.030	373.000	8.000	0.012	
1221	1592	-12.130	-13.110	270.000	8.000	0.012	
1222	1593	-13.210	-13.860	187.000	8.000	0.012	
1223	1594	-13.960	-15.040	284.000	8.000	0.012	
1224	1595	-15.140	-16.320	326.000	8.000	0.012	
1225	1596	-16.420	-17.380	269.000	8.000	0.012	
1226	1597	-17.480	-18.440	292.000	8.000	0.012	
1227	1598	-18.540	-14.400	120.000	8.000	0.012	
1228	1599	-14.500	-10.530	2,470.000	6.000	0.012	
1229	1600	-18.210	-19.210	400.000	8.000	0.012	
1230	1601	-17.100	-18.110	400.000	8.000	0.012	
1231	1602	-16.250	-17.000	259.000	8.000	0.012	
1232	1603	-15.450	-16.150	259.000	8.000	0.012	
1233	1604	-14.470	-15.350	327.000	8.000	0.012	
1234	1605	-13.670	-14.370	305.000	8.000	0.012	
1235	1606	-12.770	-13.570	261.000	8.000	0.012	
1236	1607	-11.880	-12.670	299.000	8.000	0.012	
1237	1608	-11.970	-11.780	140.000	8.000	0.012	
1238	1609	-10.960	-11.870	334.000	8.000	0.012	
1239	1610	-9.980	-10.860	334.000	8.000	0.012	
1240	1613	-8.300	-9.060	218.000	8.000	0.012	
1241	1614	-9.160	-10.660	399.000	8.000	0.012	
1242	1615	-10.760	-12.260	397.000	8.000	0.012	
1243	1616	-12.360	-13.860	395.000	8.000	0.012	
1244	1617	-13.960	-15.460	407.000	8.000	0.012	
1245	1618	-15.560	-17.060	398.000	8.000	0.012	
1246	1619	-17.160	-11.700	383.000	8.000	0.012	
1247	1620	-11.800	-9.060	2,730.000	8.000	0.012	
1248	1621	-17.060	-11.700	407.000	12.000	0.012	
1249	1622	-15.860	-16.960	394.000	12.000	0.012	
1250	1623	-14.660	-15.760	394.000	12.000	0.012	
1251	1624	-13.460	-14.560	397.000	12.000	0.012	
1252	1625	-12.260	-13.360	400.000	12.000	0.012	
1253	1626	-11.510	-12.160	252.000	12.000	0.012	
1254	1627	-10.660	-11.410	285.000	12.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM INV (Num)	TO INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
1255	1628	-14.360	-14.870	204.000	8.000	0.012	
1256	1629	-14.970	-10.300	404.000	8.000	0.012	
1257	1630	-10.400	-10.560	695.000	4.000	0.012	
1258	1631	-15.380	-10.300	400.000	8.000	0.012	
1259	1632	-13.470	-15.280	406.000	8.000	0.012	
1260	1633	-12.510	-13.370	401.000	8.000	0.012	
1261	1634	-11.290	-12.410	427.000	8.000	0.012	
1262	1635	-10.670	-11.190	204.000	8.000	0.012	
1263	1636	-13.430	-14.670	335.000	8.000	0.012	
1264	1637	-14.770	-8.300	331.000	8.000	0.012	
1265	1638	-8.400	-10.570	1,085.000	4.000	0.012	
1266	1641		-15.940	384.000	8.000	0.012	
1267	1642	-16.040	-17.270	429.000	8.000	0.012	
1268	1643	-17.370	-18.130	300.000	8.000	0.012	
1269	1644	-18.230	0.100	375.000	8.000	0.012	
1270	1645		-18.830	1,590.000	4.000	0.012	
1271	1646	-18.930	0.100	381.000	8.000	0.012	
1272	1647	-17.780	-18.830	380.000	8.000	0.012	
1273	1648	-16.620	-17.581	387.000	8.000	0.012	
1274	1649	-15.470	-16.520	385.000	8.000	0.012	
1275	1650	-14.310	-15.370	386.000	8.000	0.012	
1276	1651	-13.160	-14.210	384.000	8.000	0.012	
1277	1652	-12.000	-13.060	387.000	8.000	0.012	
1278	1653	-10.860	-11.900	377.000	8.000	0.012	
1279	1656	-12.000	-14.400	397.000	8.000	0.012	
1280	1657	-10.400	-11.900	400.000	8.000	0.012	
1281	1658	-8.000	-10.300	304.000	8.000	0.012	
1282	1661	-14.490	-14.563	91.000	8.000	0.012	
1283	1662	-13.290	-14.390	403.000	8.000	0.012	
1284	1663	-12.230	-13.190	353.000	8.000	0.012	
1285	1664	-11.220	-12.130	333.000	8.000	0.012	
1286	1665	-10.330	-11.120	301.000	8.000	0.012	
1287	1666	-9.430	-10.230	288.000	8.000	0.012	
1288	1667	-9.320	-9.330	28.000	8.000	0.012	
1289	1668	-8.120	-9.220	400.000	8.000	0.012	
1290	1669	-6.500	-8.020	28.000	4.000	0.012	
1291	1670	-17.000	-6.400	259.000	8.000	0.012	
1292	1671	-16.650	-16.900	117.000	8.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM INV (Num)	TO INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
1293	1672	-15.130	-16.550	408.000	8.000	0.012	
1294	1673	-13.930	-15.030	400.000	8.000	0.012	
1295	1674	-12.730	-13.830	404.000	8.000	0.012	
1296	1675	-11.530	-12.630	395.000	8.000	0.012	
1297	1676	-10.330	-11.430	400.000	8.000	0.012	
1298	1677	-9.480	-10.230	352.000	8.000	0.012	
1299	1678	-8.630	-9.380	217.000	8.000	0.012	
1300	1679	-7.460	-8.530	360.000	8.000	0.012	
1301	1680	-6.380	-7.360	360.000	8.000	0.012	
1302	1681	7.050	7.050	1,500.000	10.000	0.012	
1303	1683	-16.980	-17.014	78.000	8.000	0.012	
1304	1684	-16.790	-16.880	72.000	8.000	0.012	
1305	1685	-15.890	-16.690	294.000	8.000	0.012	
1306	1686	-14.990	-15.790	301.000	8.000	0.012	
1307	1687	-13.790	-14.890	402.000	8.000	0.012	
1308	1688	-13.650	-13.690	65.000	8.000	0.012	
1309	1689	-12.390	-13.550	391.000	8.000	0.012	
1310	1690	-11.450	-12.290	342.000	8.000	0.012	
1311	1691	-10.250	-11.350	371.000	8.000	0.012	
1312	1692	-6.000	-10.150	1,755.000	4.000	0.012	
1313	1693	-14.980	-9.120	397.000	8.000	0.012	
1314	1694	-13.840	-14.880	381.000	8.000	0.012	
1315	1695	-12.700	-13.740	383.000	8.000	0.012	
1316	1696	-11.560	-12.600	380.000	8.000	0.012	
1317	1697	-10.420	-11.460	380.000	8.000	0.012	
1318	1698	-9.200	-10.320	397.000	8.000	0.012	
1319	1699	-10.200	-11.600	373.000	8.000	0.012	
1320	1700	-11.700	-13.200	439.000	8.000	0.012	
1321	1701	-13.300	-14.800	361.000	8.000	0.012	
1322	1702	-14.900	-16.400	401.000	8.000	0.012	
1323	1703	-16.500	-9.900	395.000	8.000	0.012	
1324	1704	-10.000	-17.400	2,035.000	4.000	0.012	
1325	1705	-17.500	-9.900	400.000	8.000	0.012	
1326	1706	-16.300	-17.400	403.000	8.000	0.012	
1327	1707	-15.100	-16.200	398.000	8.000	0.012	
1328	1708	-13.900	-15.000	400.000	8.000	0.012	
1329	1709	-13.290	-13.800	209.000	8.000	0.012	
1330	1710	-12.700	-13.190	190.000	8.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM INV (Num)	TO INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
1331	1711	-11.500	-12.600	404.000	8.000	0.012	
1332	1712	-10.300	-11.400	398.000	8.000	0.012	
1333	1713	-9.100	-10.200	400.000	8.000	0.012	
1334	1714	-8.200	-9.000	300.000	8.000	0.012	
1335	1715	-11.520	-13.800	418.000	8.000	0.012	
1336	1716	-9.840	-11.420	420.000	8.000	0.012	
1337	1717	-8.160	-9.740	418.000	8.000	0.012	
1338	1719	-8.120	-9.610	200.000	8.000	0.012	
1339	1720	-9.710	-11.010	400.000	8.000	0.012	
1340	1721	-11.110	-12.410	400.000	8.000	0.012	
1341	1722	-12.510	-14.060	400.000	8.000	0.012	
1342	1723	-14.160	-15.280	0.000	0.000	0.012	
1343	11101	17.880	15.800	212.000	8.000	0.012	
1344	1	13.050	12.890	226.000	24.000	0.012	
1345	2	13.240	13.100	273.000	24.000	0.012	
1346	3	13.590	13.240	500.000	24.000	0.012	
1347	4	13.680	13.590	124.000	24.000	0.012	
1348	5	13.890	13.780	307.000	24.000	0.012	
1349	6	13.930	13.890	50.000	18.000	0.012	1
1350	7	14.120	13.930	276.000	24.000	0.012	
1351	17	6.750	6.000	50.000	12.000	0.012	
1352	27	7.810	6.750	221.000	10.000	0.012	
1353	30	8.330	7.910	120.000	12.000	0.012	
1354	34	11.620	10.680	302.000	12.000	0.012	
1355	35	12.130	11.720	113.000	12.000	0.012	
1356	36	12.290	12.130	146.000	12.000	0.012	
1357	53	16.050	14.220	193.000	15.000	0.012	
1358	54	16.700	16.150	283.000	15.000	0.012	
1359	55	17.020	16.800	477.000	15.000	0.012	
1360	79	15.960	15.590	163.000	15.000	0.012	
1361	133	63.610	62.100	306.000	15.000	0.012	
1362	134	64.760	63.710	450.000	15.000	0.012	
1363	135	65.660	64.860	450.000	15.000	0.012	
1364	142	39.400	35.100	200.000	12.000	0.012	
1365	143	44.000	39.500	377.000	12.000	0.012	
1366	144	45.810	44.100	391.000	12.000	0.012	
1367	145	59.000	45.910	440.000	12.000	0.012	
1368	146	61.940	59.100	316.000	12.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM_INV (Num)	TO_INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
1369	147	63.060	62.100	318.000	12.000	0.012	
1370	148	64.240	63.100	336.000	12.000	0.012	
1371	149	65.400	64.340	336.000	12.000	0.012	
1372	151	29.000	21.100	450.000	12.000	0.012	
1373	171	16.600	16.060	202.000	15.000	0.012	
1374	172	16.900	16.700	89.000	15.000	0.012	
1375	173	17.200	17.000	255.000	15.000	0.012	
1376	174	17.570	17.300	230.000	15.000	0.012	
1377	175	17.970	17.670	256.000	15.000	0.012	
1378	176	18.180	18.070	178.000	15.000	0.012	
1379	177	18.540	18.280	221.000	15.000	0.012	
1380	178	19.150	18.640	434.000	15.000	0.012	
1381	194	67.000	65.400	453.000	12.000	0.012	
1382	195	73.000	67.100	450.000	12.000	0.012	
1383	196	80.000	73.100	432.000	12.000	0.012	
1384	200	12.890	12.390	399.000	12.000	0.012	
1385	201	13.110	12.990	138.000	15.000	0.012	
1386	202	14.240	13.210	239.000	15.000	0.012	
1387	207	14.430	14.380	47.000	15.000	0.012	
1388	217	15.200	15.000	180.000	15.000	0.012	
1389	222	14.550	14.530	248.000	15.000	0.012	
1390	223	15.000	14.870	225.000	15.000	0.012	
1391	224	14.770	14.650	195.000	15.000	0.012	
1392	303	8.670	7.790	275.000	15.000	0.012	
1393	304	8.770	8.670	65.000	12.000	0.012	
1394	305	9.090	8.770	215.000	12.000	0.012	
1395	306	9.420	9.090	220.000	12.000	0.012	
1396	307	10.180	9.420	185.000	12.000	0.012	
1397	308	10.300	10.180	101.000	12.000	0.012	
1398	309	10.400	10.250	140.000	12.000	0.012	
1399	310	10.770	10.400	340.000	12.000	0.012	
1400	311	11.230	10.870	298.000	12.000	0.012	
1401	312	11.900	11.330	318.000	12.000	0.012	
1402	313	12.290	12.000	258.000	12.000	0.012	
1403	372	13.850	10.870	234.000	12.000	0.012	
1404	373	16.830	13.950	234.000	12.000	0.012	
1405	559	25.800	25.230	343.000	12.000	0.012	
1406	560	26.350	25.900	279.000	12.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM INV (Num)	TO INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
1407	561	27.090	26.450	255.000	12.000	0.012	
1408	562	29.990	27.190	255.000	12.000	0.012	
1409	563	32.204	30.090	250.000	12.000	0.012	
1410	564	32.890	32.304	293.000	12.000	0.012	
1411	565	35.000	32.990	82.000	12.000	0.012	
1412	607	2.040	1.940	61.000	18.000	0.012	
1413	608	2.770	2.140	427.000	18.000	0.012	
1414	609	3.490	2.870	425.000	18.000	0.012	
1415	610	4.220	3.590	398.000	18.000	0.012	
1416	611	4.770	4.320	403.000	18.000	0.012	
1417	612	5.380	4.870	400.000	18.000	0.012	
1418	613	5.700	5.380	264.000	18.000	0.012	
1419	614	4.810	4.045	170.000	15.000	0.012	
1420	615	5.090	4.810	215.000	15.000	0.012	
1421	616	5.420	5.090	252.000	15.000	0.012	
1422	617	6.790	5.520	244.000	15.000	0.012	
1423	618	9.000	6.890	283.000	15.000	0.012	
1424	619	10.000	9.100	316.000	15.000	0.012	
1425	620	12.000	10.100	310.000	15.000	0.012	
1426	621	20.600	12.100	328.000	15.000	0.012	
1427	622	22.320	20.700	333.000	15.000	0.012	
1428	623	22.600	22.420	331.000	15.000	0.012	
1429	713	5.850	5.700	127.000	18.000	0.012	
1430	714	6.520	5.950	367.000	18.000	0.012	
1431	715	6.890	6.620	192.000	18.000	0.012	
1432	716	7.280	6.990	224.000	18.000	0.012	
1433	717	7.780	7.380	416.000	18.000	0.012	
1434	718	8.240	7.880	401.000	18.000	0.012	
1435	719	8.830	8.340	405.000	18.000	0.012	
1436	720	9.200	8.830	399.000	18.000	0.012	
1437	721	9.470	9.100	389.000	18.000	0.012	
1438	722	6.950	5.950	200.000	12.000	0.012	
1439	723	7.840	7.050	420.000	12.000	0.012	
1440	724	8.670	7.940	396.000	12.000	0.012	
1441	725	9.470	8.770	400.000	12.000	0.012	
1442	726	9.780	9.570	54.000	12.000	0.012	
1443	755	23.350	23.000	330.000	15.000	0.012	
1444	756	24.600	23.450	376.000	12.000	0.012	

PIPE INFORMATION

	ID (Chart)	FROM INV (Num)	TO INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
1445	757	25.000	24.700	122.000	12.000	0.012	
1446	758	25.130	25.000	228.000	12.000	0.012	
1447	768	10.000	9.470	94.000	24.000	0.012	
1448	769	12.540	12.260	400.000	24.000	0.012	
1449	770	12.730	12.540	275.000	24.000	0.012	
1450	771	12.890	12.730	225.000	24.000	0.012	
1451	780	10.800	9.880	429.000	12.000	0.012	
1452	781	10.840	10.800	85.000	12.000	0.012	
1453	805	13.810	13.060	217.000	12.000	0.012	
1454	806	12.960	12.780	62.000	12.000	0.012	
1455	807	12.680	11.950	237.000	12.000	0.012	
1456	808	11.850	11.600	94.000	12.000	0.012	
1457	809	11.500	10.940	50.000	12.000	0.012	
1458	859	11.360	11.220	192.000	18.000	0.012	
1459	860	11.750	11.460	322.000	15.000	0.012	
1460	861	12.100	11.850	297.000	15.000	0.012	
1461	862	12.150	12.100	30.000	15.000	0.012	
1462	863	13.100	12.200	211.000	18.000	0.012	
1463	864	13.540	13.200	516.000	18.000	0.012	
1464	865	13.890	13.640	373.000	18.000	0.012	
1465	866	14.260	13.990	427.000	18.000	0.012	
1466	867	14.640	14.380	313.000	18.000	0.012	
1467	868	14.830	14.640	323.000	18.000	0.012	
1468	869	14.930	14.830	115.000	18.000	0.012	
1469	870	15.000	14.930	412.000	18.000	0.012	
1470	871	15.530	15.100	254.000	18.000	0.012	
1471	872	15.600	15.530	400.000	18.000	0.012	
1472	873	15.920	15.700	400.000	18.000	0.012	
1473	875	16.280	16.020	100.000	18.000	0.012	
1474	876	16.660	16.380	420.000	18.000	0.012	
1475	877	17.050	16.760	430.000	18.000	0.012	
1476	878	17.360	17.150	330.000	18.000	0.012	
1477	879	17.800	17.460	406.000	18.000	0.012	
1478	880	18.070	17.900	392.000	18.000	0.012	
1479	883	17.100	16.500	60.000	8.000	0.012	
1480	888	18.350	18.170	96.000	12.000	0.012	
1481	889	19.000	18.450	132.000	12.000	0.012	
1482	890	20.160	19.100	335.000	12.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM INV (Num)	TO INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
1483	891	20.600	20.260	199.000	12.000	0.012	
1484	892	21.270	20.700	290.000	12.000	0.012	
1485	894	15.270	13.640	243.000	12.000	0.012	
1486	895	16.200	15.370	436.000	12.000	0.012	
1487	896	16.790	16.100	257.000	12.000	0.012	
1488	897	17.450	16.890	257.000	12.000	0.012	
1489	898	18.000	17.550	386.000	12.000	0.012	
1490	899	16.000	15.370	287.000	12.000	0.012	
1491	906	19.930	18.100	214.000	12.000	0.012	
1492	907	20.830	20.030	423.000	12.000	0.012	
1493	910	0.130	-0.380	407.000	15.000	0.012	
1494	911	0.740	0.230	338.000	15.000	0.012	
1495	912	1.460	0.840	412.000	12.000	0.012	
1496	988	-2.010	-2.420	340.000	15.000	0.012	
1497	989	-1.890	-1.910	80.000	15.000	0.012	
1498	990	-1.410	-1.790	397.000	15.000	0.012	
1499	991	-1.080	-1.310	223.000	15.000	0.012	
1500	992	-0.530	-0.980	375.000	15.000	0.012	
1501	993	-0.480	-0.500	31.000	15.000	0.012	
1502	1041	7.500	4.000	20.000	15.000	0.012	
1503	1042	4.390	4.024	283.000	18.000	0.012	
1504	1043	5.050	4.490	328.000	18.000	0.012	
1505	1044	5.680	5.150	315.000	18.000	0.012	
1506	1046	7.760	6.410	290.000	18.000	0.012	
1507	1047	8.230	7.860	94.000	18.000	0.012	
1508	1048	9.710	8.330	129.000	18.000	0.012	
1509	1049	10.120	9.710	341.000	18.000	0.012	
1510	1050	10.540	10.120	350.000	18.000	0.012	
1511	1051	10.820	10.540	236.000	18.000	0.012	
1512	1052	11.050	10.820	201.000	18.000	0.012	
1513	1059	7.630	7.600	140.000	15.000	0.012	
1514	1060	8.210	7.730	453.000	15.000	0.012	
1515	1061	8.650	8.310	363.000	15.000	0.012	
1516	1062	9.010	8.750	327.000	15.000	0.012	
1517	1063	9.020	9.010	10.000	15.000	0.012	
1518	1064	9.460	9.120	365.000	18.000	0.012	
1519	1117	1.980	1.620	488.000	21.000	0.012	
1520	1118	2.440	2.080	400.000	21.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM INV (Num)	TO INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
1521	1119	2.550	2.540	240.000	21.000	0.012	
1522	1127	-3.000	5.100	1,376.000	7.805	130.000	
1523	1128	-3.610	-3.700	137.000	15.000	0.012	
1524	1129	-3.060	-3.510	367.000	15.000	0.012	
1525	1130	-2.520	-2.960	358.000	15.000	0.012	
1526	1174	-3.170	-3.510	164.000	15.000	0.012	
1527	1177	-2.580	-3.070	390.000	15.000	0.012	
1528	1178	-2.150	-2.480	285.000	15.000	0.012	
1529	1180	-1.646	-2.050	266.000	15.000	0.012	
1530	1181	4.840	-1.546	282.000	15.000	0.012	
1531	1214	-0.690	-1.000	350.000	30.000	0.012	
1532	1215	-0.240	-0.590	350.000	30.000	0.012	
1533	1216	0.176	-0.240	253.000	21.000	0.012	
1534	1217	0.410	0.176	149.000	21.000	0.012	
1535	1218	0.550	0.410	100.000	21.000	0.012	
1536	1219	0.880	0.550	252.000	21.000	0.012	
1537	1220	1.230	0.880	220.000	21.000	0.012	
1538	1221	1.590	1.230	168.000	21.000	0.012	
1539	1222	1.840	1.600	104.000	21.000	0.012	
1540	1244	1.520	1.390	240.000	21.000	0.012	
1541	1290	49.420	48.210	327.000	12.000	0.012	
1542	1291	48.110	46.620	372.000	12.000	0.012	
1543	1292	46.520	46.190	82.000	12.000	0.012	
1544	1293	46.090	45.090	276.000	12.000	0.012	
1545	1295	15.110	13.430	237.000	15.000	0.012	
1546	1296	15.400	15.210	150.000	15.000	0.012	
1547	1297	15.840	15.500	173.000	15.000	0.012	
1548	1298	16.280	15.940	265.000	15.000	0.012	
1549	1299	17.350	16.380	386.000	15.000	0.012	
1550	1300	18.190	17.450	382.000	15.000	0.012	
1551	1301	26.210	18.290	358.000	12.000	0.012	
1552	1302	34.260	26.310	371.000	12.000	0.012	
1553	1303	37.475	34.360	256.000	12.000	0.012	
1554	1305	15.650	15.210	136.000	12.000	0.012	
1555	1306	16.640	15.750	345.000	12.000	0.012	
1556	1319	37.820	34.360	155.000	12.000	0.012	
1557	1320	38.070	37.920	115.000	12.000	0.012	
1558	1321	38.690	38.170	282.000	12.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM INV (Num)	TO INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
1559	1322	39.370	38.790	282.000	12.000	0.012	
1560	1323	39.930	39.470	282.000	12.000	0.012	
1561	1324	40.300	40.030	169.000	12.000	0.012	
1562	1325	40.610	40.400	107.000	12.000	0.012	
1563	1326	41.110	40.710	100.000	12.000	0.012	
1564	1327	43.110	41.210	500.000	12.000	0.012	
1565	1328	44.130	43.210	253.000	12.000	0.012	
1566	1329	44.990	44.230	215.000	12.000	0.012	
1567	1330	19.230	18.290	368.000	12.000	0.012	
1568	1331	20.060	19.330	175.000	12.000	0.012	
1569	1378	52.000	49.520	499.000	12.000	0.012	
1570	1379	53.400	52.520	197.240	12.000	0.012	
1571	1380	54.140	53.500	150.000	12.000	0.012	
1572	1396	38.150	37.575	345.000	12.000	0.012	
1573	1397	40.000	38.250	290.000	12.000	0.012	
1574	1400	42.690	40.100	360.000	12.000	0.012	
1575	1401	43.170	42.790	218.000	12.000	0.012	
1576	1402	43.650	43.270	220.000	12.000	0.012	
1577	1420	44.140	43.750	180.000	12.000	0.012	
1578	1421	47.960	44.240	274.000	12.000	0.012	
1579	1424	44.820	44.240	265.000	8.000	0.012	
1580	1444	-16.040	-16.500	150.000	12.000	0.012	
1581	5001	11.520	11.220	28.000	15.000	0.012	
1582	5002	12.170	11.620	299.000	15.000	0.012	
1583	5003	13.030	12.270	423.000	15.000	0.012	
1584	5004	13.340	13.130	299.788	15.000	0.012	
1585	5005	14.120	13.440	356.000	15.000	0.012	
1586	5006	14.590	14.220	106.000	15.000	0.012	
1587	5007	11.120	11.050	54.000	18.000	0.012	
1588	5008	21.750	21.500	290.000	12.000	0.012	
1589	5009	21.400	21.370	60.000	12.000	0.012	
1590	5010	22.390	21.850	290.000	15.000	0.012	
1591	5011	5.770	4.000	20.000	12.000	0.012	
1592	5012	6.310	5.780	315.000	18.000	0.012	
1593	5013	1.290	0.650	225.000	21.000	0.012	
1594	5014	69.300	68.340	320.000	15.000	0.012	
1595	5015	68.240	67.690	325.000	15.000	0.012	
1596	5016	67.590	66.980	357.000	15.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM_INV (Num)	TO_INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
1597	5017	66.880	66.240	370.000	15.000	0.012	
1598	5018	66.140	65.760	299.788	15.000	0.012	
1599	5019	62.690	0.200	299.788	15.000	0.012	
1600	5020	69.000	80.100	916.000	15.000	130.000	
1601	5021	-5.000	10.000	3,460.000	12.668	130.000	
1602	5022	6.530	5.520	326.000	15.000	0.012	
1603	5023	7.690	6.630	340.000	15.000	0.012	
1604	5024	15.490	14.220	193.000	15.000	0.012	
1605	5028	10.580	9.590	303.000	12.000	0.012	
1606	5029	9.490	8.430	304.000	12.000	0.012	
1607	5030	16.500	9.780	2,600.000	10.000	0.012	
1608	5033	2.710	2.000	299.788	15.000	0.012	
1609	5035	0.000	-0.100	30.000	24.000	0.012	
1610	5036	-0.200	-0.500	30.000	24.000	0.012	
1611	5038	-3.800	-3.820	1.000	36.000	0.012	
1612	6000	55.011	50.754	945.981	15.000	0.012	
1613	6002	50.654	46.351	956.261	15.000	0.012	
1614	6004	35.167	31.321	854.517	15.000	0.012	
1615	6006	63.610	55.111	1,888.741	15.000	0.012	
1616	6008	22.828	19.250	2,104.812	15.000	0.012	
1617	6012	72.170	68.340	2,251.301	12.000	0.012	
1618	6022	60.250	52.750	181.000	8.000	0.012	
1619	6024	61.225	60.350	249.524	8.000	0.012	
1620	2000	49.460	47.500	412.000	8.000	0.012	
1621	2003	23.000	22.000	2,691.459	8.000	135.000	
1622	2005	12.220	11.500	235.000	12.000	0.012	
1623	2007	13.100	12.470	221.000	12.000	0.012	
1624	2009	12.470	12.320	83.000	12.000	0.012	
1625	2015	25.000	22.732	1,334.410	12.000	0.012	
1626	2017	46.251	40.687	1,236.269	15.000	0.012	
1627	2019	43.970	43.750	143.334	12.000	0.012	
1628	2021	43.650	43.070	83.699	12.000	0.012	
1629	2023	42.970	42.340	183.871	12.000	0.012	
1630	2025	42.580	42.240	205.322	12.000	0.012	
1631	2027	42.140	42.020	100.430	12.000	0.012	
1632	2029	41.920	41.370	288.543	12.000	0.012	
1633	2031	41.270	40.620	296.239	12.000	0.012	
1634	2035	31.221	27.977	720.950	15.000	0.012	

PIPE INFORMATION

	ID (Char)	FROM_INV (Num)	TO_INV (Num)	LENGTH (Num)	DIAMETER (Num)	COEFF (Num)	PARALLEL (Num)
1635	2037	40.587	35.267	1,182.362	15.000	0.012	
1636	2039	27.877	21.991	1,308.054	15.000	0.012	
1637	2041	21.891	16.711	1,151.128	15.000	0.012	
1638	2043	22.632	19.302	1,379.730	12.000	0.012	
1639	2047	52.420	52.100	84.825	12.000	0.012	
1640	2049	40.000	30.000	731.812	12.000	0.012	
1641	2053	22.000	18.945	624.840	12.000	0.012	
1642	2055	30.000	20.107	1,070.832	12.000	0.012	
1643	2057	18.845	18.100	491.246	12.000	0.012	
1644	2063	50.000	29.388	1,030.597	12.000	0.012	
1645	2065	29.288	21.370	1,213.491	12.000	0.012	
1646	2067	10.000	1.600	5.000	12.000	0.012	
1647	2075	0.000	14.000	24,563.000	14.000	80.000	
1648		-14.000	-15.000	10.000	15.000	0.012	
1649	F1	0.000	14.000	9,946.007	14.000	0.012	
1650	F2	0.000	14.000	17,157.332	14.000	80.000	
1651	2077	15.000	14.000	1,033.824	10.000	100.000	
1652		5.000	4.500	10.000	15.000	0.012	
1653	2105	-1.700	-1.700	395.738	18.000	0.012	0
1654	2107	-1.600	-1.600	752.202	18.000	0.012	0
1655	2109	-1.500	-1.500	447.899	18.000	0.012	0
1656	2111	-1.400	-1.400	1,064.734	18.000	0.012	0
1657	153	28.930	31.410	16.500	4.000	130.000	
1658	2125				14.000	100.000	
1659	2127				10.000	100.000	
1660	2129	20.000	14.000	2,600.000	18.000	0.012	
1661	2131	9.370	9.314	20.000	24.000	0.012	
1662	2141				18.000	0.012	
1663	2143	4.470	1.910	2,588.761	36.000	0.012	
1664	2147	2.675	-1.000	1,467.643	18.000	0.012	
1665	2149	11.620	8.330	1,117.064	18.000	0.012	
1666	2151				30.000	0.012	

APPENDIX A

The appendices that follow represent the raw data output from the H2OMAP Sewer (version 3.5) model created as a part of this Sewer Master Plan. Five sets of data are provided, as described below:

Existing System for Dry Weather Loads

The modeled system was the existing trunk sewer system under dry weather loading. Dry weather loading includes base wastewater flow and groundwater infiltration, but no rainfall dependant inflow and infiltration.

Existing System for Wet Weather Loads

The modeled system was the existing trunk sewer system under wet weather loading. Wet weather loading includes base wastewater flow, groundwater infiltration and rainfall dependant inflow and infiltration.

Existing System for Future Wet Weather Loads

The modeled system is the existing trunk sewer system under future wet weather loading. Wet weather loading includes base wastewater flow, groundwater infiltration and rainfall dependant inflow and infiltration. For this simulation, all wastewater loads from undeveloped parcels were assigned to existing trunk sewers, and only those CIP projects required to serve undeveloped areas (as opposed to those required to provide additional capacity) were included.

Future System with CIP in Place

The modeled system is the future system with all CIP projects in place. Wet weather loading factors were used to represent design conditions. Wet weather loading includes base wastewater flow, groundwater infiltration and rainfall dependant inflow and infiltration.

Pipe Information

This general table contains pipe information such as diameter and slope for all modeled pipes.

There are several fields of information provided in the tables. Below is a brief description of those fields.

Table A-1 Data Descriptions

FIELD	Description
From ID	Upstream manhole ID. For existing manholes, this ID typically corresponds to the manhole ID shown on ISD sewer drawings.
To ID	Downstream manhole ID. For existing manholes, this ID typically corresponds to the manhole ID shown on ISD sewer drawings.
Maximum Flow	The maximum flow predicted in a pipe over the course of a 24-hour simulation period.
Maximum Flow Time	The time at which the maximum flow occurred.
Maximum Velocity	The maximum velocity predicted in a pipe over a 24-hour simulation period.
Maximum Water Depth	The maximum water depth (above bottom of pipe) predicted in a pipe over a 24-hour simulation period.
Maximum d/D	The maximum ratio of water depth (d) to pipe diameter (D). A value of 1 indicates a full pipe.

EXISTING SYSTEM FOR DRY WEATHER FLOWS

ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
1	45-500	44-703	202.031	08:49 hr.	1.192	0.355	0.178
2	33-555	33-554	122.642	08:40 hr.	7.515	0.085	0.068
3	33-556	33-554	368.863	08:44 hr.	1.814	0.455	0.304
4	33-557	33-556	366.083	08:45 hr.	1.999	0.422	0.281
5	33-558	33-557	363.162	08:40 hr.	1.984	0.422	0.281
6	33-560	33-559	342.296	08:40 hr.	2.800	0.317	0.211
7	33-561	33-560	340.938	08:45 hr.	2.636	0.330	0.220
8	33-562	33-561	339.505	08:45 hr.	3.746	0.257	0.172
9	33-563	33-562	334.337	08:45 hr.	1.718	0.441	0.294
10	33-564	33-563	329.068	08:44 hr.	1.709	0.438	0.292
11	33-565	33-564	324.772	08:45 hr.	1.696	0.436	0.291
12	33-566	33-565	321.940	08:45 hr.	1.670	0.438	0.292
13	33-573	33-555	122.642	08:38 hr.	0.708	0.440	0.352
14	33-574	33-573	105.118	08:29 hr.	1.199	0.270	0.216
15	33-575	33-574	105.118	08:05 hr.	1.148	0.279	0.223
16	33-576	33-575	105.118	08:00 hr.	1.083	0.290	0.232
17	33-577	33-576	0.000	00:00 hr.	0.000	0.000	0.000
18	33-578	33-577	0.000	00:00 hr.	0.000	0.000	0.000
19	33-700	34-533	397.549	08:40 hr.	1.494	0.516	0.295
20	33-701	33-700	397.756	08:39 hr.	1.605	0.491	0.280
21	33-702	33-701	394.172	08:15 hr.	0.512	1.174	0.671
22	33-710	33-709WW	269.740	08:44 hr.	1.319	0.498	0.398
23	33-711	33-710	183.975	08:43 hr.	1.485	0.345	0.276
24	33-712	33-711	183.975	08:39 hr.	1.486	0.345	0.276
25	33-752	33-710	70.348	08:29 hr.	1.349	0.188	0.151
26	33-755	33-752	51.489	08:28 hr.	1.031	0.183	0.146
27	33-756	33-755	48.182	08:20 hr.	0.982	0.181	0.144
28	33-758	33-756	42.791	08:05 hr.	1.043	0.160	0.128
29	33-759	33-758	1.785	08:00 hr.	1.014	0.019	0.015
30	34-503	34-502	3,160.262	08:45 hr.	2.742	1.295	0.518
31	34-504	34-503	3,181.025	08:45 hr.	2.875	1.254	0.502
32	34-505	34-504	3,185.798	08:44 hr.	2.951	1.750	1.000
33	34-506	34-505	3,189.507	08:40 hr.	2.954	1.750	1.000
34	34-507	34-506	3,189.507	08:45 hr.	2.954	1.750	1.000
35	34-508	34-507	2,811.829	08:45 hr.	2.605	1.750	1.000
36	34-509	34-508	2,814.245	08:45 hr.	3.236	1.314	0.751

EXISTING SYSTEM FOR DRY WEATHER FLOWS

	ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
37	1221	34-510	34-509	2,815.336	08:45 hr.	3.669	1.170	0.669
38	1222	34-511	34-510	2,137.110	08:45 hr.	3.558	0.953	0.544
39	1244	34-533	34-532	396.758	08:40 hr.	1.337	0.559	0.319
40	1290	42-103	42-102	22.642	08:18 hr.	1.212	0.101	0.101
41	1291	42-102	42-101	22.642	08:21 hr.	1.246	0.099	0.099
42	1292	42-101	42-100	22.642	08:25 hr.	1.248	0.099	0.099
43	1293	42-100	42-340	22.642	08:19 hr.	1.203	0.102	0.102
44	1295	42-300	33-625	206.852	08:44 hr.	2.862	0.236	0.189
45	1296	42-301	42-300	185.588	08:45 hr.	1.506	0.344	0.275
46	1297	42-302	42-301	185.589	08:44 hr.	1.761	0.308	0.246
47	1298	42-303	42-302	185.606	08:40 hr.	1.513	0.343	0.274
48	1299	42-304	42-303	185.621	08:39 hr.	1.921	0.289	0.232
49	1300	42-305	42-304	185.630	08:39 hr.	1.752	0.309	0.247
50	1301	42-306	42-305	103.827	08:40 hr.	3.578	0.137	0.137
51	1302	42-307	42-306	103.828	08:40 hr.	3.539	0.138	0.138
52	1303	42-308	42-307	63.983	08:51 hr.	2.511	0.125	0.125
53	1305	42-316	42-300	15.835	08:14 hr.	1.038	0.088	0.088
54	1306	42-317	42-316	15.835	08:00 hr.	0.959	0.093	0.093
55	1319	42-330	42-307	39.846	08:40 hr.	2.692	0.086	0.086
56	1320	42-331	42-330	39.846	08:39 hr.	0.996	0.171	0.171
57	1321	42-332	42-331	35.801	08:37 hr.	1.089	0.149	0.149
58	1322	42-333	42-332	32.583	08:34 hr.	1.101	0.139	0.139
59	1323	42-334	42-333	29.363	08:29 hr.	0.984	0.140	0.140
60	1324	42-335	42-334	26.149	08:29 hr.	0.943	0.133	0.133
61	1325	42-336	42-335	26.149	08:29 hr.	1.014	0.126	0.126
62	1326	42-337	42-336	26.149	08:35 hr.	1.300	0.106	0.106
63	1327	42-338	42-337	26.149	08:29 hr.	1.277	0.108	0.108
64	1328	42-339	42-338	26.149	08:24 hr.	1.258	0.109	0.109
65	1329	42-340	42-339	26.149	08:27 hr.	1.245	0.110	0.110
66	133	53-702	53-701	30.634	11:43 hr.	1.423	0.103	0.082
67	1330	42-341	42-305	81.805	08:15 hr.	1.560	0.206	0.206
68	1331	42-342	42-341	51.627	08:00 hr.	1.618	0.146	0.146
69	134	53-703	53-702	30.634	11:39 hr.	1.096	0.123	0.098
70	135	53-704	53-703	30.634	11:39 hr.	0.997	0.131	0.105
71	1378	42-500	42-103	22.642	08:14 hr.	1.343	0.094	0.094
72	1379	42-501	42-530	22.642	08:14 hr.	1.294	0.097	0.097

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EXISTING SYSTEM FOR DRY WEATHER FLOWS

	ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
73	1380	42-502	42-501	22.642	08:00 hr.	1.274	0.098	0.098
74	1396	42-700	42-308	63.983	08:44 hr.	1.248	0.203	0.203
75	1397	42-701	42-700	63.983	08:45 hr.	1.964	0.148	0.148
76	1400	42-704	42-701	63.353	08:54 hr.	2.082	0.141	0.141
77	1401	42-705	42-704	45.020	08:35 hr.	1.143	0.169	0.169
78	1402	42-706	42-705	45.020	08:33 hr.	1.140	0.169	0.169
79	1404	42-708	42-709	2.790	08:00 hr.	0.668	0.042	0.064
80	1405	42-709	42-718	14.390	08:15 hr.	1.102	0.092	0.138
81	1415	42-718	42-719	16.630	08:20 hr.	1.099	0.102	0.153
82	1416	42-719	42-724	22.087	08:26 hr.	1.243	0.114	0.171
83	142	54-100	44-510	132.133	20:15 hr.	3.807	0.155	0.155
84	1420	42-723	42-706	44.516	08:32 hr.	1.230	0.159	0.159
85	1421	42-724	42-723	26.896	08:32 hr.	2.009	0.081	0.081
86	1424	42-727	42-723	14.404	08:00 hr.	0.929	0.104	0.155
87	143	54-101	54-100	136.381	20:14 hr.	3.124	0.181	0.181
88	144	54-102	54-101	139.587	20:15 hr.	2.205	0.235	0.235
89	1444	28-502	BETHEL_ISLE_PS	600.000	08:00 hr.	2.878	0.572	0.572
90	145	54-103	54-102	122.215	20:15 hr.	4.168	0.138	0.138
91	146	54-104	54-103	127.603	20:10 hr.	2.772	0.188	0.188
92	147	54-105	54-104	143.780	20:10 hr.	1.950	0.262	0.262
93	148	54-106	54-105	143.624	16:59 hr.	2.032	0.255	0.255
94	149	54-107	54-106	150.834	16:05 hr.	2.008	0.266	0.266
95	151	54-109	54-110	0.000	00:00 hr.	0.000	0.000	0.000
96	152	54-110	54-111	27.988	08:00 hr.	0.914	0.131	0.105
97	17	45-517	QUAIL_VALLEY_PS	86.265	08:30 hr.	2.955	0.137	0.137
98	171	54-300	55-123.1	38.019	08:29 hr.	1.227	0.132	0.105
99	172	54-301	54-300	37.029	08:35 hr.	1.145	0.136	0.109
100	173	54-302	54-301	30.317	08:32 hr.	0.746	0.159	0.127
101	174	54-303	54-302	23.373	08:27 hr.	0.795	0.127	0.102
102	175	54-304	54-303	20.917	08:20 hr.	0.768	0.121	0.097
103	176	54-305	54-304	14.863	08:00 hr.	0.554	0.119	0.096
104	177	54-306	54-305	0.000	00:00 hr.	0.000	0.000	0.000
105	178	54-307	54-306	0.000	00:00 hr.	0.000	0.000	0.000
106	194	54-500	54-107	224.628	12:10 hr.	2.341	0.317	0.317
107	195	54-501	54-500	280.785	12:10 hr.	3.988	0.254	0.254
108	196	54-502	54-501	334.368	16:00 hr.	4.499	0.264	0.264

EXISTING SYSTEM FOR DRY WEATHER FLOWS

ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
109	45-501	45-500	206.879	08:45 hr.	1.072	0.389	0.195
110	43-100	43-311	372.019	08:43 hr.	1.827	0.561	0.561
111	53-101	43-593	95.075	08:00 hr.	2.116	0.219	0.329
112	57	9000	76.240	08:05 hr.	1.629	0.190	0.190
113	59	61	72.934	08:00 hr.	1.568	0.190	0.190
114	61	57	76.240	08:10 hr.	1.352	0.217	0.217
115	43-101	43-100	372.019	08:40 hr.	1.593	0.550	0.440
116	43-102	43-101	365.824	08:35 hr.	2.830	0.356	0.285
117	42-530	42-500	22.642	08:20 hr.	1.220	0.101	0.101
118	7000	34-510	0.000	00:00 hr.	0.000	0.000	0.000
119	43-107	43-102	360.824	08:40 hr.	1.701	0.512	0.409
120	43-117	43-122.1	110.404	08:00 hr.	1.237	0.274	0.219
121	43-122	43-107	110.404	08:32 hr.	0.482	0.542	0.434
122	43-122.1	43-122.2	110.404	08:20 hr.	0.981	0.323	0.258
123	43-122.2	43-122	110.404	08:30 hr.	1.003	0.317	0.254
124	45-528	45-517	59.933	08:29 hr.	1.817	0.160	0.192
125	45-502	45-501	215.301	08:44 hr.	1.210	0.368	0.184
126	45-531	45-528	53.544	08:27 hr.	1.538	0.155	0.155
127	43-301	43-300	527.620	08:45 hr.	2.817	0.466	0.373
128	43-302	43-301	513.284	08:50 hr.	2.123	0.648	0.648
129	43-303	43-302	513.301	08:49 hr.	2.095	0.656	0.556
130	43-304	43-303	513.312	08:49 hr.	2.101	0.654	0.654
131	43-305	43-304	513.318	08:49 hr.	3.094	0.477	0.477
132	43-306	43-305	513.322	08:49 hr.	1.909	0.713	0.713
133	43-307	43-306	493.836	08:49 hr.	1.816	0.720	0.720
134	43-308	43-307	493.842	08:49 hr.	1.828	0.716	0.716
135	43-309	43-308	412.781	08:49 hr.	1.844	0.607	0.607
136	43-310	43-309	409.684	08:49 hr.	2.142	0.533	0.533
137	43-311	43-310	404.294	08:48 hr.	1.784	0.613	0.613
138	45-535	45-534	17.254	08:14 hr.	1.051	0.093	0.093
139	45-536	45-535	16.180	08:14 hr.	1.087	0.087	0.087
140	45-537	45-536	0.698	08:00 hr.	0.275	0.026	0.026
141	43-365	43-308	79.158	08:10 hr.	2.719	0.137	0.137
142	43-366	43-365	78.326	08:00 hr.	2.678	0.138	0.138
143	45-503	45-502	216.572	08:44 hr.	1.228	0.365	0.183
144	43-587	43-780	118.046	08:44 hr.	1.923	0.249	0.299

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EXISTING SYSTEM FOR DRY WEATHER FLOWS

	ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
145	494	43-588	43-587	115.730	08:40 hr.	1.977	0.241	0.289
146	495	43-589	43-588	113.827	08:38 hr.	1.957	0.239	0.287
147	496	43-590	43-589	109.717	08:35 hr.	2.027	0.227	0.273
148	497	43-591	43-590	104.120	08:30 hr.	1.921	0.228	0.273
149	498	43-592	43-591	98.101	08:34 hr.	1.793	0.229	0.275
150	499	43-593	43-592	97.959	08:19 hr.	1.646	0.270	0.405
151	5	45-504	45-503	219.244	08:40 hr.	0.960	0.438	0.219
152	5001	33-630	33-629	246.124	08:50 hr.	3.485	0.232	0.186
153	5002	33-631	33-630	206.767	08:50 hr.	1.774	0.331	0.264
154	5003	33-632	33-631	206.790	08:49 hr.	1.759	0.333	0.266
155	5004	33-633	33-632	206.818	08:44 hr.	1.255	0.424	0.339
156	5005	33-634	33-633	206.846	08:45 hr.	1.798	0.327	0.262
157	5006	33-625	33-634	206.849	08:45 hr.	2.228	0.281	0.225
158	5007	33-629	33-566	321.940	08:50 hr.	1.746	0.424	0.283
159	5008	32-301	32-300	2.302	11:00 hr.	0.365	0.049	0.049
160	5009	32-300	32-504	3.662	11:15 hr.	0.348	0.069	0.069
161	5010	32-302	32-301	0.000	00:00 hr.	0.000	0.000	0.000
162	5011	33-729	33-702	390.000	00:30 hr.	8.630	0.186	0.186
163	5012	33-559	33-558	360.365	08:40 hr.	1.980	0.420	0.280
164	5013	34-532	34-507	424.249	08:39 hr.	2.461	0.379	0.217
165	5014	53-709	54-708	30.634	11:00 hr.	1.196	0.116	0.093
166	5015	54-708	54-707	30.634	11:05 hr.	0.980	0.133	0.106
167	5016	54-707	54-706	30.634	11:20 hr.	0.983	0.132	0.106
168	5017	54-706	54-705	30.634	11:25 hr.	0.987	0.132	0.106
169	5018	54-705	53-704	30.634	11:30 hr.	0.885	0.142	0.114
170	5019	53-701	53-700WW	30.634	11:48 hr.	5.233	0.043	0.034
171	5022	43-298	44-109	614.761	08:45 hr.	2.902	0.511	0.409
172	5023	43-300	43-298	613.450	08:44 hr.	2.907	0.510	0.408
173	5024	55-123	45-506	59.691	08:32 hr.	1.925	0.132	0.106
174	5028	45-534	45-303	42.148	08:18 hr.	1.398	0.140	0.140
175	5029	45-303	45-531	46.289	08:30 hr.	1.471	0.145	0.145
176	5033	33-774	IRONWOODWW	46.316	08:00 hr.	1.248	0.149	0.119
177	5035	33-554	33-554.1	491.344	08:45 hr.	2.676	0.376	0.188
178	5036	33-554.1	IRONWOODWW	491.344	08:40 hr.	3.938	0.288	0.144
179	5038	33-709	33-709WW	52.341	08:00 hr.	2.398	0.077	0.026
180	53	55-100	45-506	182.301	09:04 hr.	3.055	0.207	0.165

EXISTING SYSTEM FOR DRY WEATHER FLOWS

ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
181	55-102	55-100	186.599	17:44 hr.	1.756	0.310	0.248
182	55-103	55-102	190.342	08:39 hr.	1.055	0.454	0.363
183	44-504	44-503	308.527	20:15 hr.	1.940	0.462	0.462
184	55-104	55-103	196.671	08:40 hr.	2.688	0.283	0.339
185	44-505	44-504	289.204	20:15 hr.	1.886	0.449	0.449
186	44-506	44-505	292.108	20:14 hr.	2.225	0.399	0.399
187	44-507	44-506	120.644	20:14 hr.	2.925	0.174	0.174
188	44-508	44-507	122.327	20:10 hr.	2.679	0.187	0.187
189	44-509	44-508	131.094	20:10 hr.	1.639	0.278	0.278
190	44-510	44-509	131.094	20:15 hr.	3.977	0.149	0.149
191	55-105	55-104	197.011	08:39 hr.	2.262	0.321	0.386
192	43-771	44-506	198.770	08:44 hr.	2.055	0.348	0.417
193	43-772	43-771	193.493	08:50 hr.	2.014	0.346	0.415
194	43-773	43-772	192.060	08:49 hr.	2.267	0.315	0.378
195	43-774	43-773	180.377	08:50 hr.	2.144	0.313	0.376
196	43-775	43-774	174.758	08:49 hr.	2.200	0.300	0.360
197	43-776	43-775	173.548	08:49 hr.	2.101	0.309	0.371
198	43-777	43-776	162.636	08:49 hr.	2.008	0.305	0.366
199	55-106	55-105	347.563	14:05 hr.	2.219	0.509	0.611
200	43-778	43-777	159.972	08:47 hr.	2.031	0.298	0.358
201	43-779	43-778	149.363	08:45 hr.	2.029	0.284	0.341
202	43-780	43-779	138.463	08:40 hr.	2.012	0.270	0.324
203	55-107	55-106	372.501	19:15 hr.	3.316	0.390	0.468
204	45-505	45-504	220.191	08:45 hr.	1.077	0.280	0.187
205	44-100	34-511	1,125.507	08:50 hr.	2.688	0.788	0.525
206	44-101	44-100	1,129.157	08:49 hr.	2.565	0.815	0.543
207	44-102	44-101	1,148.710	08:45 hr.	2.565	0.826	0.551
208	44-103	44-102	1,160.463	08:45 hr.	2.652	0.811	0.541
209	44-104	44-103	1,175.128	08:40 hr.	2.325	0.913	0.609
210	44-105	44-104	1,197.902	08:39 hr.	2.459	0.885	0.590
211	44-106	44-105	1,210.967	09:09 hr.	2.416	0.906	0.604
212	44-107	34-511	956.276	08:49 hr.	3.740	0.590	0.472
213	44-108	44-107	956.624	08:49 hr.	2.313	0.879	0.703
214	44-109	44-108	956.845	08:50 hr.	2.318	0.877	0.702
215	44-110	44-109	348.733	20:35 hr.	2.987	0.331	0.265
216	44-111	44-110	349.309	20:30 hr.	3.396	0.303	0.242

EXISTING SYSTEM FOR DRY WEATHER FLOWS

ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
217	44-112	44-111	351.636	20:30 hr.	2.413	0.388	0.310
218	44-113	44-112	352.863	20:29 hr.	3.176	0.319	0.256
219	44-114	44-113	315.151	20:30 hr.	5.117	0.211	0.169
220	44-115	44-114	309.988	20:30 hr.	2.818	0.317	0.254
221	44-116	44-115	313.230	20:25 hr.	1.280	0.570	0.456
222	45-506	45-505	232.187	08:45 hr.	1.230	0.383	0.192
223	44-300	44-106	1,212.884	09:09 hr.	2.393	0.915	0.610
224	44-301	44-300	1,105.208	09:05 hr.	2.602	0.792	0.528
225	44-302	44-301	1,121.653	09:05 hr.	2.515	0.824	0.549
226	44-303	44-302	1,147.933	09:05 hr.	2.450	0.857	0.572
227	44-304	44-303	1,160.770	09:00 hr.	2.186	0.952	0.635
228	44-305	44-304	1,191.616	08:59 hr.	2.138	0.993	0.662
229	44-306	44-305	1,196.447	09:00 hr.	2.408	0.900	0.600
230	44-307	44-306	1,244.276	08:55 hr.	2.183	1.013	0.675
231	44-308	44-307	1,252.718	08:50 hr.	2.209	1.009	0.672
232	44-309	44-300	205.031	08:24 hr.	2.584	0.276	0.276
233	44-310	44-309	206.281	08:20 hr.	1.822	0.358	0.358
234	44-311	44-310	209.736	08:19 hr.	1.817	0.363	0.363
235	44-311.1	44-311	175.655	08:15 hr.	1.697	0.335	0.335
236	44-311.2	44-311.1	175.769	08:20 hr.	2.260	0.272	0.272
237	44-500	44-116	315.334	20:24 hr.	1.639	0.476	0.381
238	44-501	44-500	318.958	20:20 hr.	2.449	0.397	0.397
239	44-502	44-501	320.194	20:20 hr.	2.263	0.422	0.422
240	44-503	44-502	311.659	20:20 hr.	1.292	0.647	0.647
241	44-700	44-308	217.677	08:55 hr.	2.525	0.223	0.112
242	44-701	44-700	220.086	08:50 hr.	1.218	0.372	0.186
243	44-702	44-701	222.301	08:50 hr.	1.216	0.375	0.187
244	44-703	44-702	200.889	08:49 hr.	1.192	0.354	0.177
245	44-712	44-311.2	178.965	08:20 hr.	1.836	0.321	0.321
246	44-713	44-712	179.252	08:25 hr.	1.056	0.486	0.486
247	55-123.1	55-123	38.019	08:33 hr.	1.158	0.137	0.110
248	44-731	44-732	117.541	08:29 hr.	2.032	0.264	0.397
249	44-732	44-733	111.665	08:30 hr.	1.982	0.259	0.389
250	44-733	44-734	111.800	08:34 hr.	2.429	0.223	0.335
251	44-734	44-735	117.627	08:35 hr.	1.531	0.328	0.493
252	44-735	44-736	117.689	08:34 hr.	2.009	0.267	0.400

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EXISTING SYSTEM FOR DRY WEATHER FLOWS

ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
253	44-736	44-736.1	118.426	08:35 hr.	1.934	0.230	0.230
254	44-736.1	44-736.2	118.168	08:40 hr.	1.817	0.240	0.240
255	44-736.2	44-736.3	117.998	08:34 hr.	1.855	0.236	0.236
256	44-736.3	44-736.4	117.432	08:35 hr.	1.758	0.245	0.245
257	44-736.4	44-713	117.432	08:30 hr.	2.922	0.171	0.171
258	44-745	44-731	122.079	08:29 hr.	2.021	0.273	0.410
259	44-746	44-745	121.050	08:30 hr.	2.028	0.271	0.406
260	44-747	44-746	128.374	08:25 hr.	1.277	0.408	0.612
261	44-748	44-747	136.014	08:25 hr.	2.658	0.241	0.362
262	44-749	44-748	139.529	08:24 hr.	2.170	0.286	0.429
263	44-750	44-749	146.474	19:15 hr.	2.152	0.299	0.448
264	44-751	44-750	149.145	08:25 hr.	2.721	0.298	0.596
265	44-752	44-751	163.244	19:15 hr.	1.852	0.500	1.000
266	44-753	44-752	166.000	08:20 hr.	1.884	0.500	1.000
267	32-700	33-629	107.273	15:39 hr.	1.035	0.283	0.188
268	32-701	32-700	108.800	15:35 hr.	1.143	0.286	0.229
269	32-702	32-701	89.673	10:49 hr.	1.055	0.265	0.212
270	32-703	32-702	89.693	10:55 hr.	1.343	0.224	0.179
271	32-704	32-703	90.260	10:55 hr.	1.827	0.170	0.113
272	32-705	32-704	91.092	10:54 hr.	0.951	0.267	0.178
273	32-706	32-705	67.007	15:30 hr.	0.874	0.229	0.153
274	32-707	32-706	68.039	15:25 hr.	0.860	0.234	0.156
275	32-708	32-707	70.548	15:25 hr.	0.957	0.223	0.149
276	32-709	32-708	72.353	15:24 hr.	0.854	0.246	0.164
277	32-710	32-709	72.491	15:25 hr.	0.980	0.224	0.149
278	32-711	32-710	75.299	15:15 hr.	0.557	0.340	0.227
279	32-712	32-711	77.035	15:15 hr.	1.261	0.196	0.131
280	32-713	32-712	79.563	15:10 hr.	0.572	0.347	0.231
281	32-714	32-713	85.232	15:05 hr.	0.875	0.271	0.180
282	32-100	32-714	84.581	15:10 hr.	1.507	0.185	0.123
283	32-101	32-100	87.268	15:10 hr.	0.943	0.261	0.174
284	32-102	32-101	92.053	15:05 hr.	0.962	0.267	0.178
285	32-103	32-102	84.421	15:00 hr.	0.919	0.260	0.173
286	32-104	32-103	111.660	15:00 hr.	1.099	0.279	0.186
287	32-105	32-104	149.494	15:30 hr.	0.948	0.379	0.253
288	32-107	32-110	5.420	11:00 hr.	0.903	0.054	0.081

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EXISTING SYSTEM FOR DRY WEATHER FLOWS

	ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
289	883	32-108	32-109	9,216	11:00 hr.	1.383	0.058	0.087
290	884	32-109	32-110	10,888	11:00 hr.	2.126	0.049	0.073
291	888	32-500	32-105	8,377	11:35 hr.	0.708	0.074	0.074
292	889	32-501	32-500	8,377	11:20 hr.	0.935	0.062	0.062
293	890	32-502	32-501	6,696	11:18 hr.	0.793	0.059	0.059
294	891	32-503	32-502	6,696	11:15 hr.	0.640	0.068	0.068
295	892	32-504	32-503	3,662	11:10 hr.	0.559	0.050	0.050
296	894	32-715	32-705	51,064	08:40 hr.	1.905	0.130	0.130
297	895	32-716	32-715	40,140	08:37 hr.	1.140	0.156	0.156
298	896	32-717	32-716	32,384	08:34 hr.	1.206	0.130	0.130
299	897	32-718	32-717	28,813	08:30 hr.	1.083	0.129	0.129
300	898	32-719	32-718	15,717	08:19 hr.	0.725	0.112	0.112
301	899	32-720	32-715	5,862	08:00 hr.	0.671	0.060	0.060
302	906	32-726	32-719	15,717	08:24 hr.	1.453	0.070	0.070
303	907	32-727	32-726	15,717	08:00 hr.	0.859	0.100	0.100
304	910	33-100	33-505	65,963	08:24 hr.	1.109	0.206	0.165
305	911	33-101	33-100	63,154	08:20 hr.	1.169	0.193	0.154
306	912	33-102	33-101	15,106	08:00 hr.	0.783	0.103	0.103
307	988	33-500	33-712	152,726	08:33 hr.	1.399	0.316	0.252
308	989	33-501	33-500	152,726	08:40 hr.	0.795	0.475	0.380
309	990	33-502	33-501	133,735	08:38 hr.	1.240	0.313	0.250
310	991	33-503	33-502	79,959	08:29 hr.	1.096	0.238	0.190
311	992	33-504	33-503	79,959	08:25 hr.	1.156	0.229	0.183
312	993	33-505	33-504	79,959	08:30 hr.	0.929	0.267	0.214

EXISTING SYSTEM FOR WET WEATHER LOADS

	ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
1	1	45-500	44-703	221.223	08:49 hr.	1.225	0.372	0.186
2	1041	33-555	33-554	144.786	08:40 hr.	7.903	0.092	0.074
3	1042	33-556	33-554	457.135	08:54 hr.	1.926	0.509	0.339
4	1043	33-557	33-556	453.884	08:55 hr.	2.125	0.472	0.315
5	1044	33-558	33-557	450.267	08:50 hr.	2.109	0.472	0.314
6	1046	33-560	33-559	425.583	08:49 hr.	2.983	0.353	0.236
7	1047	33-561	33-560	423.980	08:55 hr.	2.808	0.368	0.245
8	1048	33-562	33-561	422.275	08:55 hr.	3.996	0.286	0.191
9	1049	33-563	33-562	416.331	08:55 hr.	1.828	0.494	0.329
10	1050	33-564	33-563	411.036	08:59 hr.	1.820	0.491	0.327
11	1051	33-565	33-564	406.927	08:59 hr.	1.808	0.490	0.327
12	1052	33-566	33-565	402.646	08:55 hr.	1.779	0.492	0.328
13	1059	33-573	33-555	144.786	08:38 hr.	0.741	0.481	0.385
14	1060	33-574	33-573	124.098	08:29 hr.	1.258	0.294	0.235
15	1061	33-575	33-574	124.098	08:05 hr.	1.204	0.303	0.242
16	1062	33-576	33-575	124.098	08:00 hr.	1.136	0.316	0.253
17	1063	33-577	33-576	0.000	00:00 hr.	0.000	0.000	0.000
18	1064	33-578	33-577	0.000	00:00 hr.	0.000	0.000	0.000
19	1117	33-700	34-533	399.272	08:55 hr.	1.496	0.517	0.296
20	1118	33-701	33-700	399.272	08:53 hr.	1.606	0.492	0.281
21	1119	33-702	33-701	911.302	24:01 hr.	0.844	1.750	1.000
22	1128	33-710	33-709WW	317.641	08:44 hr.	1.378	0.545	0.436
23	1129	33-711	33-710	217.192	08:43 hr.	1.556	0.376	0.301
24	1130	33-712	33-711	217.192	08:39 hr.	1.558	0.376	0.301
25	1174	33-752	33-710	83.049	08:29 hr.	1.417	0.204	0.163
26	1177	33-755	33-752	60.785	08:28 hr.	1.083	0.198	0.158
27	1178	33-756	33-755	56.881	08:20 hr.	1.032	0.196	0.157
28	1180	33-758	33-756	50.517	08:05 hr.	1.096	0.173	0.138
29	1181	33-759	33-758	2.107	08:00 hr.	1.067	0.021	0.017
30	1214	34-503	34-502	3,916.784	08:54 hr.	2.884	1.480	0.592
31	1215	34-504	34-503	3,918.265	08:55 hr.	3.023	1.424	0.570
32	1216	34-505	34-504	3,920.334	08:50 hr.	3.631	1.750	1.000
33	1217	34-506	34-505	3,904.651	08:49 hr.	3.617	1.750	1.000
34	1218	34-507	34-506	3,904.868	08:55 hr.	3.617	1.750	1.000
35	1219	34-508	34-507	3,464.829	08:55 hr.	3.209	1.750	1.000
36	1220	34-509	34-508	3,453.092	08:55 hr.	3.199	1.750	1.000

EXISTING SYSTEM FOR WET WEATHER LOADS

	ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
37	1221	34-510	34-509	3,452.831	08:55 hr.	3.773	1.383	0.790
38	1222	34-511	34-510	2,774.091	08:55 hr.	3.770	1.128	0.645
39	1244	34-533	34-532	399.270	08:54 hr.	1.339	0.560	0.320
40	1290	42-103	42-102	32.194	08:18 hr.	1.347	0.120	0.120
41	1291	42-102	42-101	32.194	08:21 hr.	1.385	0.118	0.118
42	1292	42-101	42-100	32.194	08:25 hr.	1.387	0.117	0.117
43	1293	42-100	42-340	32.194	08:19 hr.	1.337	0.120	0.120
44	1295	42-300	33-625	252.210	08:44 hr.	3.033	0.260	0.208
45	1296	42-301	42-300	225.881	08:45 hr.	1.592	0.381	0.304
46	1297	42-302	42-301	225.882	08:44 hr.	1.863	0.340	0.272
47	1298	42-303	42-302	225.899	08:40 hr.	1.600	0.379	0.303
48	1299	42-304	42-303	225.913	08:39 hr.	2.034	0.319	0.256
49	1300	42-305	42-304	225.923	08:39 hr.	1.854	0.341	0.273
50	1301	42-306	42-305	129.349	08:40 hr.	3.821	0.152	0.152
51	1302	42-307	42-306	129.350	08:40 hr.	3.778	0.153	0.153
52	1303	42-308	42-307	76.001	08:51 hr.	2.644	0.136	0.136
53	1305	42-316	42-300	17.690	08:14 hr.	1.073	0.093	0.093
54	1306	42-317	42-316	17.690	08:00 hr.	0.992	0.098	0.098
55	1319	42-330	42-307	53.351	08:40 hr.	2.939	0.099	0.099
56	1320	42-331	42-330	53.351	08:39 hr.	1.085	0.197	0.197
57	1321	42-332	42-331	48.575	08:37 hr.	1.193	0.173	0.173
58	1322	42-333	42-332	44.776	08:34 hr.	1.210	0.162	0.162
59	1323	42-334	42-333	40.975	08:29 hr.	1.086	0.164	0.164
60	1324	42-335	42-334	37.180	08:29 hr.	1.048	0.157	0.157
61	1325	42-336	42-335	37.180	08:29 hr.	1.126	0.150	0.150
62	1326	42-337	42-336	37.180	08:35 hr.	1.445	0.126	0.126
63	1327	42-338	42-337	37.180	08:29 hr.	1.420	0.128	0.128
64	1328	42-339	42-338	37.180	08:24 hr.	1.398	0.129	0.129
65	1329	42-340	42-339	37.180	08:27 hr.	1.384	0.130	0.130
66	133	53-702	53-701	52.663	11:43 hr.	1.676	0.133	0.106
67	1330	42-341	42-305	96.575	08:15 hr.	1.637	0.224	0.224
68	1331	42-342	42-341	60.948	08:00 hr.	1.700	0.158	0.158
69	134	53-703	53-702	52.663	11:39 hr.	1.290	0.159	0.127
70	135	53-704	53-703	52.663	11:39 hr.	1.172	0.170	0.136
71	1378	42-500	42-103	32.194	08:14 hr.	1.494	0.112	0.112
72	1379	42-501	42-530	32.194	08:14 hr.	1.438	0.115	0.115

EXISTING SYSTEM FOR WET WEATHER LOADS

	ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
73	1380	42-502	42-501	32.194	08:00 hr.	1.416	0.116	0.116
74	1396	42-700	42-308	76.001	08:44 hr.	1.313	0.221	0.221
75	1397	42-701	42-700	76.001	08:45 hr.	2.067	0.161	0.161
76	1400	42-704	42-701	74.792	08:54 hr.	2.188	0.153	0.153
77	1401	42-705	42-704	53.148	08:35 hr.	1.201	0.183	0.183
78	1402	42-706	42-705	53.148	08:33 hr.	1.197	0.184	0.184
79	1404	42-708	42-709	3.293	08:00 hr.	0.702	0.046	0.069
80	1405	42-709	42-718	16.988	08:15 hr.	1.158	0.100	0.150
81	1415	42-718	42-719	19.633	08:20 hr.	1.155	0.110	0.166
82	1416	42-719	42-724	26.075	08:26 hr.	1.306	0.123	0.185
83	142	54-100	44-510	170.532	11:40 hr.	4.106	0.175	0.175
84	1420	42-723	42-706	52.554	08:32 hr.	1.292	0.173	0.173
85	1421	42-724	42-723	31.753	08:32 hr.	2.113	0.087	0.087
86	1424	42-727	42-723	17.004	08:00 hr.	0.976	0.112	0.168
87	143	54-101	54-100	175.093	11:40 hr.	3.362	0.205	0.205
88	144	54-102	54-101	181.367	11:39 hr.	2.378	0.269	0.269
89	1444	28-502	BETHEL_ISLE_PS	995.000	08:00 hr.	2.823	1.000	1.000
90	145	54-103	54-102	167.298	11:40 hr.	4.577	0.160	0.160
91	146	54-104	54-103	169.281	11:40 hr.	3.011	0.217	0.217
92	147	54-105	54-104	170.869	11:39 hr.	2.048	0.286	0.286
93	148	54-106	54-105	166.814	11:35 hr.	2.121	0.275	0.275
94	149	54-107	54-106	177.708	11:35 hr.	2.104	0.289	0.289
95	151	54-109	54-110	0.000	00:00 hr.	0.000	0.000	0.000
96	152	54-110	54-111	33.042	08:00 hr.	0.961	0.142	0.113
97	17	45-517	QUAIL_VALLEY_PS	96.372	08:30 hr.	3.054	0.145	0.145
98	171	54-300	55-123.1	44.884	08:29 hr.	1.289	0.143	0.114
99	172	54-301	54-300	43.715	08:35 hr.	1.204	0.147	0.118
100	173	54-302	54-301	35.791	08:32 hr.	0.784	0.172	0.137
101	174	54-303	54-302	27.593	08:27 hr.	0.835	0.138	0.110
102	175	54-304	54-303	24.694	08:20 hr.	0.807	0.131	0.105
103	176	54-305	54-304	17.546	08:00 hr.	0.582	0.129	0.103
104	177	54-306	54-305	0.000	00:00 hr.	0.000	0.000	0.000
105	178	54-307	54-306	0.000	00:00 hr.	0.000	0.000	0.000
106	194	54-500	54-107	232.636	11:35 hr.	2.365	0.323	0.323
107	195	54-501	54-500	279.938	19:00 hr.	3.984	0.253	0.253
108	196	54-502	54-501	336.449	21:40 hr.	4.507	0.265	0.265

EXISTING SYSTEM FOR WET WEATHER LOADS

ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
109	45-501	45-500	226.071	08:45 hr.	1.100	0.407	0.203
110	43-100	43-311	439.189	08:43 hr.	1.895	0.625	0.625
111	53-101	43-593	99.923	08:00 hr.	2.146	0.225	0.338
112	57	9000	76.240	08:05 hr.	1.629	0.190	0.190
113	59	61	72.934	08:00 hr.	1.568	0.190	0.190
114	61	57	76.240	08:10 hr.	1.352	0.217	0.217
115	43-101	43-100	439.189	08:40 hr.	1.663	0.605	0.484
116	43-102	43-101	431.876	08:35 hr.	2.967	0.388	0.310
117	42-530	42-500	32.194	08:20 hr.	1.356	0.119	0.119
118	7000	34-510	0.000	00:00 hr.	0.000	0.000	0.000
119	43-107	43-102	425.973	08:40 hr.	1.778	0.561	0.449
120	43-117	43-122.1	130.338	08:00 hr.	1.298	0.297	0.238
121	43-122	43-107	130.338	08:32 hr.	0.503	0.596	0.477
122	43-122.1	43-122.2	130.338	08:20 hr.	1.028	0.351	0.281
123	43-122.2	43-122	130.338	08:30 hr.	1.052	0.345	0.276
124	45-528	45-517	66.954	08:29 hr.	1.877	0.169	0.203
125	45-502	45-501	234.493	08:44 hr.	1.241	0.383	0.192
126	45-531	45-528	59.817	08:27 hr.	1.589	0.164	0.164
127	43-301	43-300	624.466	08:45 hr.	2.949	0.511	0.409
128	43-302	43-301	608.764	08:50 hr.	2.185	0.737	0.737
129	43-303	43-302	608.781	08:49 hr.	2.154	0.748	0.748
130	43-304	43-303	608.792	08:49 hr.	2.161	0.745	0.745
131	43-305	43-304	608.798	08:49 hr.	3.229	0.527	0.527
132	43-306	43-305	608.801	08:49 hr.	1.727	1.000	1.000
133	43-307	43-306	582.921	08:49 hr.	1.654	1.000	1.000
134	43-308	43-307	582.927	08:49 hr.	1.654	1.000	1.000
135	43-309	43-308	487.229	08:49 hr.	1.906	0.681	0.681
136	43-310	43-309	483.573	08:49 hr.	2.227	0.592	0.592
137	43-311	43-310	477.210	08:48 hr.	1.843	0.689	0.689
138	45-535	45-534	19.276	08:14 hr.	1.087	0.098	0.098
139	45-536	45-535	18.076	08:14 hr.	1.125	0.091	0.091
140	45-537	45-536	0.780	08:00 hr.	0.285	0.028	0.028
141	43-365	43-308	93.450	08:10 hr.	2.857	0.149	0.149
142	43-366	43-365	92.469	08:00 hr.	2.814	0.149	0.149
143	45-503	45-502	235.764	08:44 hr.	1.259	0.381	0.191
144	43-587	43-780	128.487	08:44 hr.	1.969	0.260	0.312
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EXISTING SYSTEM FOR WET WEATHER LOADS

	ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
145	494	43-588	43-587	125.752	08:40 hr.	2.024	0.251	0.301
146	495	43-589	43-588	123.506	08:38 hr.	2.003	0.250	0.300
147	496	43-590	43-589	118.654	08:35 hr.	2.072	0.237	0.284
148	497	43-591	43-590	112.046	08:30 hr.	1.962	0.236	0.284
149	498	43-592	43-591	104.940	08:34 hr.	1.828	0.237	0.285
150	499	43-593	43-592	103.328	08:19 hr.	1.670	0.278	0.417
151	5	45-504	45-503	235.823	08:40 hr.	0.981	0.454	0.227
152	5001	33-630	33-629	295.587	08:50 hr.	3.677	0.254	0.203
153	5002	33-631	33-630	252.125	08:50 hr.	1.878	0.366	0.293
154	5003	33-632	33-631	252.148	08:49 hr.	1.862	0.368	0.294
155	5004	33-633	33-632	252.177	08:44 hr.	1.326	0.472	0.377
156	5005	33-634	33-633	252.204	08:45 hr.	1.903	0.362	0.290
157	5006	33-625	33-634	252.207	08:45 hr.	2.360	0.311	0.249
158	5007	33-629	33-566	402.646	09:00 hr.	1.861	0.476	0.317
159	5008	32-301	32-300	2.894	11:00 hr.	0.391	0.054	0.054
160	5009	32-300	32-504	4.605	11:15 hr.	0.372	0.076	0.076
161	5010	32-302	32-301	0.000	00:00 hr.	0.000	0.000	0.000
162	5011	33-729	33-702	780.000	24:05 hr.	10.562	0.263	0.263
163	5012	33-559	33-558	446.907	08:50 hr.	2.104	0.470	0.313
164	5013	34-532	34-507	435.483	08:54 hr.	2.480	0.384	0.220
165	5014	53-709	54-708	52.663	11:00 hr.	1.408	0.150	0.120
166	5015	54-708	54-707	52.663	11:05 hr.	1.152	0.172	0.138
167	5016	54-707	54-706	52.663	11:20 hr.	1.156	0.172	0.137
168	5017	54-706	54-705	52.663	11:25 hr.	1.161	0.171	0.137
169	5018	54-705	53-704	52.663	11:30 hr.	1.041	0.184	0.148
170	5019	53-701	53-700WW	52.663	11:48 hr.	6.174	0.055	0.044
171	5022	43-298	44-109	727.832	08:45 hr.	3.035	0.561	0.449
172	5023	43-300	43-298	725.911	08:44 hr.	3.040	0.560	0.448
173	5024	55-123	45-506	70.469	08:32 hr.	2.023	0.143	0.114
174	5028	45-534	45-303	47.086	08:18 hr.	1.445	0.148	0.148
175	5029	45-303	45-531	51.713	08:30 hr.	1.520	0.153	0.153
176	5033	33-774	IRONWOODWW	54.678	08:00 hr.	1.311	0.162	0.129
177	5035	33-554	33-554.1	600.660	08:50 hr.	2.839	0.415	0.207
178	5036	33-554.1	IRONWOODWW	600.660	08:45 hr.	4.181	0.317	0.159
179	5038	33-709	33-709WW	63.642	08:00 hr.	2.546	0.084	0.028
180	53	55-100	45-506	187.750	09:04 hr.	3.081	0.210	0.168

EXISTING SYSTEM FOR WET WEATHER LOADS

ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
181	55-102	55-100	189.452	09:05 hr.	1.764	0.312	0.250
182	55-103	55-102	192.051	08:39 hr.	1.057	0.456	0.365
183	44-504	44-503	423.808	08:49 hr.	2.098	0.557	0.557
184	55-104	55-103	198.326	08:40 hr.	2.695	0.284	0.341
185	44-505	44-504	391.594	08:45 hr.	2.036	0.536	0.536
186	44-506	44-505	392.779	08:45 hr.	2.405	0.471	0.471
187	44-507	44-506	164.650	11:40 hr.	3.206	0.203	0.203
188	44-508	44-507	165.370	11:39 hr.	2.927	0.217	0.217
189	44-509	44-508	169.061	11:35 hr.	1.762	0.317	0.317
190	44-510	44-509	169.235	11:40 hr.	4.290	0.169	0.169
191	55-105	55-104	198.167	08:39 hr.	2.265	0.323	0.387
192	43-771	44-506	230.714	08:44 hr.	2.138	0.378	0.453
193	43-772	43-771	224.069	08:50 hr.	2.094	0.375	0.451
194	43-773	43-772	222.264	08:49 hr.	2.358	0.341	0.409
195	43-774	43-773	207.551	08:50 hr.	2.227	0.338	0.406
196	43-775	43-774	200.476	08:49 hr.	2.284	0.323	0.388
197	43-776	43-775	198.963	08:49 hr.	2.180	0.333	0.399
198	43-777	43-776	182.907	08:49 hr.	2.073	0.325	0.389
199	55-106	55-105	347.563	14:05 hr.	2.219	0.509	0.611
200	43-778	43-777	179.552	08:47 hr.	2.097	0.317	0.381
201	43-779	43-778	166.193	08:45 hr.	2.090	0.300	0.361
202	43-780	43-779	152.589	08:40 hr.	2.068	0.284	0.341
203	55-107	55-106	372.501	19:15 hr.	3.316	0.390	0.468
204	45-505	45-504	236.770	08:45 hr.	1.101	0.290	0.193
205	44-100	34-511	1,490.891	09:00 hr.	2.845	0.942	0.628
206	44-101	44-100	1,492.785	09:00 hr.	2.728	0.977	0.651
207	44-102	44-101	1,494.589	08:54 hr.	2.716	0.982	0.655
208	44-103	44-102	1,496.996	08:55 hr.	2.808	0.956	0.637
209	44-104	44-103	1,498.949	08:50 hr.	2.433	1.088	0.725
210	44-105	44-104	1,501.878	08:49 hr.	2.573	1.035	0.690
211	44-106	44-105	1,502.838	08:49 hr.	2.520	1.055	0.704
212	44-107	34-511	1,209.443	08:54 hr.	3.965	0.678	0.542
213	44-108	44-107	1,212.330	08:54 hr.	2.201	1.250	1.000
214	44-109	44-108	1,214.356	08:54 hr.	2.205	1.250	1.000
215	44-110	44-109	499.195	08:59 hr.	3.307	0.398	0.318
216	44-111	44-110	499.394	08:59 hr.	3.763	0.363	0.290

EXISTING SYSTEM FOR WET WEATHER LOADS

ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
217	44-112	44-111	502.182	08:55 hr.	2.664	0.468	0.375
218	44-113	44-112	504.224	08:54 hr.	3.517	0.384	0.307
219	44-114	44-113	455.599	09:00 hr.	5.704	0.253	0.203
220	44-115	44-114	449.964	09:00 hr.	3.135	0.384	0.307
221	44-116	44-115	450.790	08:55 hr.	1.401	0.708	0.566
222	45-506	45-505	248.766	08:45 hr.	1.255	0.396	0.198
223	44-300	44-106	1,504.876	08:45 hr.	2.493	1.067	0.711
224	44-301	44-300	1,289.612	08:55 hr.	2.699	0.871	0.581
225	44-302	44-301	1,290.535	08:54 hr.	2.597	0.900	0.600
226	44-303	44-302	1,291.874	08:54 hr.	2.514	0.926	0.617
227	44-304	44-303	1,292.546	08:54 hr.	2.231	1.028	0.685
228	44-305	44-304	1,230.805	08:50 hr.	2.150	1.017	0.678
229	44-306	44-305	1,241.152	09:00 hr.	2.428	0.922	0.615
230	44-307	44-306	1,278.091	09:00 hr.	2.194	1.033	0.689
231	44-308	44-307	1,288.166	08:44 hr.	2.220	1.029	0.686
232	44-309	44-300	231.135	08:45 hr.	2.674	0.294	0.294
233	44-310	44-309	233.362	08:40 hr.	1.884	0.382	0.382
234	44-311	44-310	235.793	08:39 hr.	1.876	0.386	0.386
235	44-311.1	44-311	196.029	08:35 hr.	1.750	0.355	0.355
236	44-311.2	44-311.1	196.203	08:40 hr.	2.333	0.288	0.288
237	44-500	44-116	452.338	08:54 hr.	1.804	0.581	0.465
238	44-501	44-500	453.256	08:54 hr.	2.686	0.483	0.483
239	44-502	44-501	453.321	08:54 hr.	2.475	0.515	0.515
240	44-503	44-502	439.692	08:50 hr.	1.247	1.000	1.000
241	44-700	44-308	239.545	08:55 hr.	2.599	0.234	0.117
242	44-701	44-700	241.955	08:50 hr.	1.253	0.389	0.195
243	44-702	44-701	244.170	08:50 hr.	1.250	0.392	0.196
244	44-703	44-702	220.081	08:49 hr.	1.225	0.370	0.185
245	44-712	44-311.2	199.394	08:39 hr.	1.892	0.339	0.339
246	44-713	44-712	199.551	08:45 hr.	1.084	0.517	0.517
247	55-123.1	55-123	44.884	08:33 hr.	1.218	0.148	0.119
248	44-731	44-732	124.610	08:50 hr.	2.064	0.273	0.409
249	44-732	44-733	120.707	08:54 hr.	2.024	0.270	0.406
250	44-733	44-734	121.233	08:55 hr.	2.484	0.233	0.350
251	44-734	44-735	129.889	08:54 hr.	1.569	0.348	0.522
252	44-735	44-736	128.270	08:55 hr.	2.056	0.280	0.420

EXISTING SYSTEM FOR WET WEATHER LOADS

	ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
253	805	44-736	44-736.1	130.309	08:55 hr.	1.988	0.241	0.241
254	806	44-736.1	44-736.2	128.176	09:00 hr.	1.860	0.250	0.250
255	807	44-736.2	44-736.3	128.121	08:54 hr.	1.899	0.246	0.246
256	808	44-736.3	44-736.4	127.715	08:55 hr.	1.801	0.255	0.255
257	809	44-736.4	44-713	127.715	08:50 hr.	2.996	0.178	0.178
258	818	44-745	44-731	130.946	08:50 hr.	2.059	0.284	0.426
259	819	44-746	44-745	128.973	08:49 hr.	2.063	0.280	0.420
260	820	44-747	44-746	133.008	08:45 hr.	1.287	0.418	0.627
261	821	44-748	44-747	139.913	08:45 hr.	2.678	0.245	0.368
262	822	44-749	44-748	142.584	08:45 hr.	2.183	0.290	0.435
263	823	44-750	44-749	152.276	08:45 hr.	2.174	0.306	0.458
264	824	44-751	44-750	152.177	08:44 hr.	2.733	0.302	0.604
265	825	44-752	44-751	167.879	08:45 hr.	1.905	0.500	1.000
266	826	44-753	44-752	166.000	07:15 hr.	1.884	0.500	1.000
267	859	32-700	33-629	130.598	11:00 hr.	1.096	0.311	0.208
268	860	32-701	32-700	131.590	11:00 hr.	1.208	0.315	0.252
269	861	32-702	32-701	109.236	08:59 hr.	1.117	0.292	0.233
270	862	32-703	32-702	109.341	09:05 hr.	1.423	0.246	0.197
271	863	32-704	32-703	109.623	09:05 hr.	1.937	0.186	0.124
272	864	32-705	32-704	110.450	08:59 hr.	1.007	0.294	0.196
273	865	32-706	32-705	73.392	11:55 hr.	0.898	0.240	0.160
274	866	32-707	32-706	73.561	11:50 hr.	0.880	0.243	0.162
275	867	32-708	32-707	75.583	11:49 hr.	0.977	0.231	0.154
276	868	32-709	32-708	77.031	11:45 hr.	0.870	0.253	0.169
277	869	32-710	32-709	78.334	11:45 hr.	1.003	0.232	0.155
278	870	32-711	32-710	81.770	11:40 hr.	0.571	0.355	0.236
279	871	32-712	32-711	83.584	11:40 hr.	1.292	0.204	0.136
280	872	32-713	32-712	83.871	11:34 hr.	0.581	0.356	0.238
281	873	32-714	32-713	88.174	11:29 hr.	0.884	0.275	0.183
282	875	32-100	32-714	87.901	11:35 hr.	1.525	0.188	0.126
283	876	32-101	32-100	88.353	11:30 hr.	0.947	0.263	0.175
284	877	32-102	32-101	91.635	10:59 hr.	0.981	0.267	0.178
285	878	32-103	32-102	86.149	11:50 hr.	0.925	0.262	0.175
286	879	32-104	32-103	109.126	12:59 hr.	1.092	0.275	0.184
287	880	32-105	32-104	148.393	17:00 hr.	0.946	0.378	0.252
288	882	32-107	32-110	6.815	11:00 hr.	0.967	0.060	0.091

EXISTING SYSTEM FOR WET WEATHER LOADS

	ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
289	883	32-108	32-109	11.587	11:00 hr.	1.481	0.065	0.097
290	884	32-109	32-110	13.690	11:00 hr.	2.278	0.054	0.081
291	888	32-500	32-105	10.533	11:35 hr.	0.759	0.083	0.083
292	889	32-501	32-500	10.533	11:20 hr.	1.002	0.069	0.069
293	890	32-502	32-501	8.419	11:18 hr.	0.851	0.066	0.066
294	891	32-503	32-502	8.419	11:15 hr.	0.686	0.076	0.076
295	892	32-504	32-503	4.605	11:10 hr.	0.600	0.055	0.055
296	894	32-715	32-705	60.284	08:40 hr.	2.002	0.140	0.140
297	895	32-716	32-715	47.388	08:37 hr.	1.197	0.170	0.170
298	896	32-717	32-716	38.231	08:34 hr.	1.267	0.141	0.141
299	897	32-718	32-717	34.015	08:30 hr.	1.138	0.140	0.140
300	898	32-719	32-718	18.554	08:19 hr.	0.762	0.121	0.121
301	899	32-720	32-715	6.921	08:00 hr.	0.706	0.065	0.065
302	906	32-726	32-719	18.554	08:24 hr.	1.528	0.076	0.076
303	907	32-727	32-726	18.554	08:00 hr.	0.903	0.108	0.108
304	910	33-100	33-505	77.873	08:24 hr.	1.165	0.224	0.179
305	911	33-101	33-100	74.557	08:20 hr.	1.228	0.209	0.167
306	912	33-102	33-101	17.834	08:00 hr.	0.824	0.112	0.112
307	988	33-500	33-712	180.301	08:33 hr.	1.467	0.343	0.275
308	989	33-501	33-500	180.301	08:40 hr.	0.831	0.520	0.416
309	990	33-502	33-501	157.881	08:38 hr.	1.301	0.340	0.272
310	991	33-503	33-502	94.396	08:29 hr.	1.151	0.258	0.206
311	992	33-504	33-503	94.396	08:25 hr.	1.214	0.249	0.199
312	993	33-505	33-504	94.396	08:30 hr.	0.975	0.290	0.232

EXISTING SYSTEM FOR FUTURE WET WEATHER LOADS

	ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
1	1	45-500	44-703	1,287.038	09:00 hr.	2.013	0.927	0.463
2	1041	33-555	33-554	144.786	08:40 hr.	7.903	0.092	0.074
3	1042	33-556	33-554	1,879.520	11:50 hr.	2.370	1.500	1.000
4	1043	33-557	33-556	1,878.249	11:45 hr.	3.014	1.100	0.733
5	1044	33-558	33-557	1,876.751	11:45 hr.	2.994	1.106	0.737
6	1046	33-560	33-559	1,862.842	11:44 hr.	4.476	0.779	0.519
7	1047	33-561	33-560	1,861.918	11:50 hr.	4.200	0.820	0.546
8	1048	33-562	33-561	1,860.933	11:49 hr.	6.093	0.614	0.409
9	1049	33-563	33-562	1,857.411	11:45 hr.	2.342	1.500	1.000
10	1050	33-564	33-563	1,855.121	11:45 hr.	2.339	1.500	1.000
11	1051	33-565	33-564	1,852.813	11:45 hr.	2.336	1.500	1.000
12	1052	33-566	33-565	1,846.712	11:45 hr.	2.328	1.500	1.000
13	1059	33-573	33-555	144.786	08:38 hr.	0.741	0.481	0.385
14	1060	33-574	33-573	124.098	08:29 hr.	1.258	0.294	0.235
15	1061	33-575	33-574	124.098	08:05 hr.	1.204	0.303	0.242
16	1062	33-576	33-575	124.098	08:00 hr.	1.136	0.316	0.253
17	1063	33-577	33-576	0.000	00:00 hr.	0.000	0.000	0.000
18	1064	33-578	33-577	0.000	00:00 hr.	0.000	0.000	0.000
19	1117	33-700	34-533	394.273	08:35 hr.	1.491	0.514	0.294
20	1118	33-701	33-700	394.273	08:36 hr.	1.601	0.488	0.279
21	1119	33-702	33-701	389.925	08:01 hr.	0.511	1.165	0.665
22	1128	33-710	33-709WW	317.641	08:44 hr.	1.378	0.545	0.436
23	1129	33-711	33-710	217.192	08:43 hr.	1.556	0.376	0.301
24	1130	33-712	33-711	217.192	08:39 hr.	1.558	0.376	0.301
25	1174	33-752	33-710	83.049	08:29 hr.	1.417	0.204	0.163
26	1177	33-755	33-752	60.785	08:28 hr.	1.083	0.198	0.158
27	1178	33-756	33-755	56.881	08:20 hr.	1.032	0.196	0.157
28	1180	33-758	33-756	50.517	08:05 hr.	1.096	0.173	0.138
29	1181	33-759	33-758	2.107	08:00 hr.	1.067	0.021	0.017
30	1214	34-503	34-502	12,154.374	09:24 hr.	5.517	2.500	1.000
31	1215	34-504	34-503	12,158.155	09:20 hr.	5.518	2.500	1.000
32	1216	34-505	34-504	12,167.977	09:20 hr.	11.271	1.750	1.000
33	1217	34-506	34-505	12,157.342	09:19 hr.	11.261	1.750	1.000
34	1218	34-507	34-506	12,158.834	09:25 hr.	11.263	1.750	1.000
35	1219	34-508	34-507	11,741.337	09:25 hr.	10.876	1.750	1.000
36	1220	34-509	34-508	11,737.665	09:25 hr.	10.873	1.750	1.000

EXISTING SYSTEM FOR FUTURE WET WEATHER LOADS

	ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
37	1221	34-510	34-509	11,740.481	09:25 hr.	10.875	1.750	1.000
38	1222	34-511	34-510	9,943.314	09:25 hr.	9.210	1.750	1.000
39	1244	34-533	34-532	394.273	08:40 hr.	1.335	0.557	0.318
40	1290	42-103	42-102	120.075	08:19 hr.	1.989	0.228	0.228
41	1291	42-102	42-101	120.075	08:24 hr.	2.046	0.223	0.223
42	1292	42-101	42-100	120.075	08:25 hr.	2.049	0.223	0.223
43	1293	42-100	42-340	120.075	08:23 hr.	1.975	0.229	0.229
44	1295	42-300	33-625	606.133	08:45 hr.	3.903	0.406	0.325
45	1296	42-301	42-300	568.887	08:45 hr.	2.043	0.631	0.504
46	1297	42-302	42-301	568.898	08:44 hr.	2.405	0.556	0.444
47	1298	42-303	42-302	568.916	08:40 hr.	2.052	0.628	0.503
48	1299	42-304	42-303	569.004	08:40 hr.	2.633	0.519	0.415
49	1300	42-305	42-304	569.068	08:39 hr.	2.393	0.558	0.446
50	1301	42-306	42-305	472.508	08:40 hr.	5.579	0.290	0.290
51	1302	42-307	42-306	472.517	08:40 hr.	5.516	0.292	0.292
52	1303	42-308	42-307	260.127	08:54 hr.	3.798	0.249	0.249
53	1305	42-316	42-300	28.632	08:14 hr.	1.241	0.117	0.117
54	1306	42-317	42-316	28.632	08:00 hr.	1.146	0.123	0.123
55	1319	42-330	42-307	212.409	08:40 hr.	4.439	0.193	0.193
56	1320	42-331	42-330	212.410	08:40 hr.	1.608	0.401	0.401
57	1321	42-332	42-331	207.634	08:39 hr.	1.812	0.361	0.361
58	1322	42-333	42-332	203.835	08:39 hr.	1.875	0.347	0.347
59	1323	42-334	42-333	200.034	08:34 hr.	1.716	0.365	0.365
60	1324	42-335	42-334	196.239	08:34 hr.	1.694	0.364	0.364
61	1325	42-336	42-335	196.239	08:30 hr.	1.825	0.344	0.344
62	1326	42-337	42-336	137.842	08:35 hr.	2.129	0.239	0.239
63	1327	42-338	42-337	137.842	08:34 hr.	2.090	0.242	0.242
64	1328	42-339	42-338	132.908	08:28 hr.	2.036	0.241	0.241
65	1329	42-340	42-339	132.908	08:24 hr.	2.016	0.242	0.242
66	1330	42-341	42-305	96.575	08:15 hr.	1.637	0.224	0.224
67	1331	42-342	42-341	60.948	08:00 hr.	1.700	0.158	0.158
68	134	53-703	53-702	294.352	10:54 hr.	2.136	0.373	0.298
69	135	53-704	53-703	294.352	10:54 hr.	1.938	0.400	0.320
70	1378	42-500	42-103	102.739	08:17 hr.	2.110	0.196	0.196
71	1379	42-501	42-530	46.294	08:22 hr.	1.604	0.136	0.136
72	1380	42-502	42-501	46.294	08:00 hr.	1.579	0.138	0.138

EXISTING SYSTEM FOR FUTURE WET WEATHER LOADS

	ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
73	1396	42-700	42-308	260.128	08:51 hr.	1.857	0.419	0.419
74	1397	42-701	42-700	242.179	08:49 hr.	2.898	0.287	0.287
75	1400	42-704	42-701	240.970	08:45 hr.	3.082	0.274	0.274
76	1401	42-705	42-704	204.466	08:43 hr.	1.768	0.363	0.363
77	1402	42-706	42-705	204.466	08:45 hr.	1.762	0.364	0.364
78	1404	42-708	42-709	109.474	11:19 hr.	1.969	0.257	0.385
79	1405	42-709	42-718	136.726	10:30 hr.	2.104	0.289	0.433
80	1415	42-718	42-719	138.545	10:36 hr.	2.012	0.302	0.452
81	1416	42-719	42-724	142.978	10:40 hr.	2.114	0.298	0.446
82	142	54-100	44-510	328.042	08:41 hr.	4.973	0.242	0.242
83	1420	42-723	42-706	203.872	08:39 hr.	1.911	0.342	0.342
84	1421	42-724	42-723	183.070	08:40 hr.	3.565	0.203	0.203
85	1424	42-727	42-723	17.004	08:00 hr.	0.976	0.112	0.168
86	143	54-101	54-100	293.590	08:39 hr.	3.906	0.266	0.266
87	144	54-102	54-101	293.590	08:35 hr.	2.725	0.345	0.345
88	1444	28-502	BETHEL_ISLE_PS	2,129.599	08:00 hr.	6.041	1.000	1.000
89	145	54-103	54-102	227.709	08:34 hr.	5.014	0.187	0.187
90	146	54-104	54-103	227.709	08:29 hr.	3.282	0.251	0.251
91	147	54-105	54-104	227.709	08:25 hr.	2.221	0.333	0.333
92	148	54-106	54-105	77.244	08:10 hr.	1.695	0.187	0.187
93	149	54-107	54-106	77.244	08:05 hr.	1.652	0.190	0.190
94	151	54-109	54-110	0.000	00:00 hr.	0.000	0.000	0.000
95	152	54-110	54-111	311.336	08:00 hr.	1.851	0.431	0.345
96	17	45-517	QUAIL_VALLEY_PS	447.726	08:40 hr.	4.780	0.311	0.311
97	171	54-300	55-123.1	44.884	08:29 hr.	1.289	0.143	0.114
98	172	54-301	54-300	43.715	08:35 hr.	1.204	0.147	0.118
99	173	54-302	54-301	35.791	08:32 hr.	0.784	0.172	0.137
100	174	54-303	54-302	27.593	08:27 hr.	0.835	0.138	0.110
101	175	54-304	54-303	24.694	08:20 hr.	0.807	0.131	0.105
102	176	54-305	54-304	17.546	08:00 hr.	0.582	0.129	0.103
103	177	54-306	54-305	0.000	00:00 hr.	0.000	0.000	0.000
104	178	54-307	54-306	0.000	00:00 hr.	0.000	0.000	0.000
105	194	54-500	54-107	77.244	08:00 hr.	1.720	0.185	0.185
106	195	54-501	54-500	0.000	00:00 hr.	0.000	0.000	0.000
107	196	54-502	54-501	0.000	00:00 hr.	0.000	0.000	0.000
108	2	45-501	45-500	1,288.557	08:55 hr.	1.785	1.019	0.509

EXISTING SYSTEM FOR FUTURE WET WEATHER LOADS

ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
145	45-531	45-528	378.294	08:35 hr.	2.693	0.420	0.420
146	43-301	43-300	693.315	08:45 hr.	3.032	0.541	0.433
147	43-302	43-301	662.267	08:50 hr.	2.202	0.796	0.796
148	43-303	43-302	662.285	08:49 hr.	2.167	0.809	0.809
149	43-304	43-303	662.297	08:49 hr.	2.175	0.806	0.806
150	43-305	43-304	662.305	08:49 hr.	3.294	0.555	0.555
151	43-306	43-305	662.308	08:49 hr.	1.879	1.000	1.000
152	43-307	43-306	636.428	08:49 hr.	1.805	1.000	1.000
153	43-308	43-307	636.435	08:49 hr.	1.805	1.000	1.000
154	43-309	43-308	503.094	08:49 hr.	1.916	0.698	0.698
155	43-310	43-309	499.438	08:49 hr.	2.242	0.604	0.604
156	43-311	43-310	491.086	08:48 hr.	1.852	0.704	0.704
157	45-535	45-534	337.753	08:19 hr.	2.503	0.407	0.407
158	45-536	45-535	336.553	08:15 hr.	2.644	0.390	0.390
159	45-537	45-536	319.258	08:00 hr.	1.674	0.532	0.532
160	43-365	43-308	93.450	08:10 hr.	2.857	0.149	0.149
161	43-366	43-365	92.469	08:00 hr.	2.814	0.149	0.149
162	45-503	45-502	1,290.085	08:54 hr.	2.033	0.921	0.461
163	43-587	43-780	181.267	08:34 hr.	2.167	0.312	0.374
164	43-588	43-587	178.532	08:40 hr.	2.232	0.302	0.362
165	43-589	43-588	172.006	08:39 hr.	2.198	0.297	0.356
166	43-590	43-589	167.153	08:35 hr.	2.283	0.283	0.339
167	43-591	43-590	160.545	08:30 hr.	2.171	0.285	0.342
168	43-592	43-591	153.440	08:28 hr.	2.035	0.289	0.347
169	43-593	43-592	150.123	08:19 hr.	1.839	0.344	0.517
170	45-504	45-503	1,266.946	08:50 hr.	1.552	1.125	0.562
171	33-630	33-629	649.071	08:50 hr.	4.615	0.378	0.303
172	33-631	33-630	605.745	08:50 hr.	2.386	0.587	0.469
173	33-632	33-631	605.891	08:49 hr.	2.365	0.591	0.473
174	33-633	33-632	605.952	08:45 hr.	1.650	0.791	0.632
175	33-634	33-633	606.094	08:45 hr.	2.420	0.581	0.464
176	33-625	33-634	606.110	08:45 hr.	3.020	0.491	0.393
177	33-629	33-566	1,846.712	11:50 hr.	2.328	1.500	1.000
178	32-301	32-300	2.894	11:00 hr.	0.391	0.054	0.054
179	32-300	32-504	4.605	11:15 hr.	0.372	0.076	0.076
180	32-302	32-301	0.000	00:00 hr.	0.000	0.000	0.000

EXISTING SYSTEM FOR FUTURE WET WEATHER LOADS

	ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
181	5011	33-729	33-702	385.000	00:40 hr.	8.597	0.185	0.185
182	5012	33-559	33-558	1,875.104	11:44 hr.	2.994	1.105	0.737
183	5013	34-532	34-507	430.488	08:44 hr.	2.472	0.382	0.218
184	5014	53-709	54-708	52.663	11:00 hr.	1.408	0.150	0.120
185	5015	54-708	54-707	294.352	10:20 hr.	1.904	0.405	0.324
186	5016	54-707	54-706	294.352	10:35 hr.	1.910	0.404	0.323
187	5017	54-706	54-705	294.352	10:40 hr.	1.919	0.403	0.322
188	5018	54-705	53-704	294.352	10:50 hr.	1.715	0.437	0.350
189	5022	43-298	44-109	796.673	08:45 hr.	3.107	0.591	0.473
190	5023	43-300	43-298	794.757	08:44 hr.	3.112	0.589	0.471
191	5024	55-123	45-506	841.258	08:55 hr.	4.158	0.494	0.395
192	5028	45-534	45-303	365.563	08:29 hr.	2.602	0.420	0.420
193	5029	45-303	45-531	370.190	08:30 hr.	2.674	0.415	0.415
194	5033	33-774	IRONWOODWW	68.628	08:00 hr.	1.403	0.180	0.144
195	5035	33-554	33-554.1	1,969.263	11:00 hr.	3.980	0.764	0.382
196	5036	33-554.1	IRONWOODWW	1,969.263	10:55 hr.	5.913	0.572	0.286
197	5038	33-709	33-709WW	63.642	08:00 hr.	2.546	0.084	0.028
198	53	55-100	45-506	425.610	08:46 hr.	3.916	0.315	0.252
199	54	55-102	55-100	416.528	08:34 hr.	2.203	0.469	0.376
200	55	55-103	55-102	401.154	08:25 hr.	1.280	0.693	0.554
201	559	44-504	44-503	691.272	08:45 hr.	2.289	0.799	0.799
202	56	55-104	55-103	400.808	08:25 hr.	3.250	0.419	0.503
203	560	44-505	44-504	658.273	08:44 hr.	2.251	0.773	0.773
204	561	44-506	44-505	658.280	08:44 hr.	2.714	0.650	0.650
205	562	44-507	44-506	328.042	08:49 hr.	3.914	0.287	0.287
206	563	44-508	44-507	328.042	08:49 hr.	3.564	0.307	0.307
207	564	44-509	44-508	328.042	08:39 hr.	2.111	0.454	0.454
208	585	44-510	44-509	328.042	08:45 hr.	5.210	0.235	0.235
209	57	55-105	55-104	397.543	08:23 hr.	2.704	0.483	0.579
210	573	43-771	44-506	290.170	08:44 hr.	2.266	0.432	0.518
211	574	43-772	43-771	283.525	08:50 hr.	2.223	0.430	0.517
212	575	43-773	43-772	281.720	08:49 hr.	2.510	0.389	0.467
213	576	43-774	43-773	267.007	08:50 hr.	2.380	0.389	0.467
214	577	43-775	43-774	259.932	08:49 hr.	2.448	0.373	0.448
215	578	43-776	43-775	258.409	08:49 hr.	2.337	0.385	0.462
216	579	43-777	43-776	235.687	08:48 hr.	2.218	0.373	0.448

EXISTING SYSTEM FOR FUTURE WET WEATHER LOADS

	ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
217	58	55-106	55-105	395.708	08:10 hr.	2.278	0.557	0.688
218	580	43-778	43-777	232.332	08:48 hr.	2.247	0.366	0.439
219	581	43-779	43-778	218.974	08:45 hr.	2.253	0.349	0.419
220	582	43-780	43-779	205.369	08:40 hr.	2.243	0.334	0.400
221	59	55-107	55-106	374.045	08:00 hr.	3.320	0.391	0.469
222	6	45-505	45-504	1,267.203	08:55 hr.	1.765	0.694	0.463
223	6000	5004	5000	333.232	08:54 hr.	2.799	0.336	0.269
224	6002	5000	5003	378.507	08:54 hr.	2.903	0.358	0.287
225	6004	5002	5022	544.365	09:00 hr.	3.215	0.433	0.346
226	6006	53-702	5004	294.350	10:55 hr.	2.701	0.315	0.252
227	6012	5008	54-708	115.470	11:00 hr.	1.492	0.271	0.271
228	6022	42-760	42-708	107.551	11:17 hr.	4.741	0.135	0.202
229	6024	5012	42-760	107.551	11:00 hr.	1.961	0.254	0.381
230	607	44-100	34-511	8,446.007	09:35 hr.	10.649	1.500	1.000
231	608	44-101	44-100	8,477.503	09:30 hr.	10.688	1.500	1.000
232	609	44-102	44-101	8,495.582	09:30 hr.	10.711	1.500	1.000
233	610	44-103	44-102	8,497.763	09:30 hr.	10.714	1.500	1.000
234	611	44-104	44-103	8,540.270	09:24 hr.	10.768	1.500	1.000
235	612	44-105	44-104	8,569.374	09:24 hr.	10.804	1.500	1.000
236	613	44-106	44-105	8,585.168	09:24 hr.	10.824	1.500	1.000
237	614	44-107	34-511	1,609.359	08:49 hr.	4.222	0.817	0.653
238	615	44-108	44-107	1,609.858	08:49 hr.	2.923	1.250	1.000
239	616	44-109	44-108	1,609.988	08:50 hr.	2.923	1.250	1.000
240	617	44-110	44-109	814.551	08:54 hr.	3.784	0.517	0.414
241	618	44-111	44-110	814.595	08:54 hr.	4.314	0.469	0.375
242	619	44-112	44-111	814.607	08:55 hr.	3.028	0.614	0.491
243	620	44-113	44-112	803.676	08:50 hr.	4.002	0.491	0.393
244	621	44-114	44-113	750.773	08:50 hr.	6.596	0.325	0.260
245	622	44-115	44-114	722.546	08:50 hr.	3.574	0.493	0.395
246	623	44-116	44-115	722.668	08:50 hr.	1.520	1.007	0.806
247	7	45-506	45-505	1,268.406	08:55 hr.	1.985	0.926	0.463
248	713	44-300	44-106	8,587.721	09:24 hr.	10.827	1.500	1.000
249	714	44-301	44-300	8,091.079	09:55 hr.	10.201	1.500	1.000
250	715	44-302	44-301	8,115.008	09:55 hr.	10.231	1.500	1.000
251	716	44-303	44-302	8,147.988	09:55 hr.	10.273	1.500	1.000
252	717	44-304	44-303	8,195.460	09:50 hr.	10.333	1.500	1.000

EXISTING SYSTEM FOR FUTURE WET WEATHER LOADS

ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
253	44-305	44-304	8,164.171	09:49 hr.	10.293	1.500	1.000
254	44-306	44-305	8,207.918	09:19 hr.	10.349	1.500	1.000
255	44-307	44-306	8,207.751	09:15 hr.	10.348	1.500	1.000
256	44-308	44-307	8,221.307	09:10 hr.	10.365	1.500	1.000
257	44-309	44-300	666.233	08:30 hr.	3.555	0.525	0.525
258	44-310	44-309	666.132	08:29 hr.	2.413	0.731	0.731
259	44-311	44-310	664.165	08:29 hr.	2.391	0.735	0.735
260	44-311.1	44-311	609.029	08:29 hr.	2.309	0.701	0.701
261	44-311.2	44-311.1	609.052	08:35 hr.	3.163	0.536	0.536
262	44-500	44-116	722.736	08:49 hr.	2.018	0.774	0.619
263	44-501	44-500	722.757	08:49 hr.	2.992	0.648	0.648
264	44-502	44-501	722.761	08:45 hr.	2.737	0.701	0.701
265	44-503	44-502	708.043	08:44 hr.	2.009	1.000	1.000
266	44-700	44-308	1,319.183	09:00 hr.	4.298	0.540	0.270
267	44-701	44-700	1,320.195	09:00 hr.	2.018	0.943	0.472
268	44-702	44-701	1,320.476	08:59 hr.	2.008	0.947	0.474
269	44-703	44-702	1,286.905	08:59 hr.	2.016	0.926	0.463
270	44-712	44-311.2	609.125	08:34 hr.	2.509	0.651	0.651
271	44-713	44-712	609.126	08:40 hr.	1.728	1.000	1.000
272	55-123.1	55-123	818.919	08:59 hr.	2.784	0.659	0.527
273	44-731	44-732	403.355	08:54 hr.	2.575	0.667	1.000
274	44-732	44-733	405.935	08:54 hr.	2.591	0.667	1.000
275	44-733	44-734	408.434	08:54 hr.	3.329	0.487	0.731
276	44-734	44-735	417.780	08:54 hr.	2.667	0.667	1.000
277	44-735	44-736	422.640	08:54 hr.	2.698	0.667	1.000
278	44-736	44-736.1	529.145	08:54 hr.	2.923	0.511	0.511
279	44-736.1	44-736.2	529.138	08:55 hr.	2.736	0.538	0.538
280	44-736.2	44-736.3	529.133	08:49 hr.	2.798	0.529	0.529
281	44-736.3	44-736.4	529.124	08:50 hr.	2.646	0.553	0.553
282	44-736.4	44-713	529.124	08:45 hr.	4.507	0.367	0.367
283	44-745	44-731	401.392	08:53 hr.	2.562	0.667	1.000
284	44-746	44-745	393.789	08:50 hr.	2.513	0.667	1.000
285	44-747	44-746	392.618	08:45 hr.	2.506	0.667	1.000
286	44-748	44-747	332.499	08:44 hr.	3.336	0.405	0.608
287	44-749	44-748	328.301	08:41 hr.	2.631	0.495	0.743
288	44-750	44-749	326.555	08:39 hr.	2.564	0.505	0.758

EXISTING SYSTEM FOR FUTURE WET WEATHER LOADS

	ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
289	824	44-751	44-750	321.088	08:40 hr.	3.643	0.500	1.000
290	825	44-752	44-751	318.114	08:31 hr.	3.610	0.500	1.000
291	826	44-753	44-752	315.000	05:55 hr.	3.574	0.500	1.000
292	859	32-700	33-629	1,364.632	11:55 hr.	1.988	1.212	0.808
293	860	32-701	32-700	1,365.701	11:49 hr.	2.479	1.250	1.000
294	861	32-702	32-701	1,341.563	11:49 hr.	2.436	1.250	1.000
295	862	32-703	32-702	1,341.590	11:55 hr.	2.436	1.250	1.000
296	863	32-704	32-703	1,341.967	11:54 hr.	3.985	0.661	0.441
297	864	32-705	32-704	1,327.976	11:54 hr.	1.674	1.500	1.000
298	865	32-706	32-705	1,106.986	11:59 hr.	1.871	1.048	0.699
299	866	32-707	32-706	1,107.225	11:59 hr.	1.826	1.072	0.715
300	867	32-708	32-707	1,107.327	11:59 hr.	2.042	0.969	0.646
301	868	32-709	32-708	1,107.380	11:59 hr.	1.770	1.104	0.736
302	869	32-710	32-709	1,107.385	12:00 hr.	2.080	0.954	0.636
303	870	32-711	32-710	1,107.393	11:54 hr.	1.396	1.500	1.000
304	871	32-712	32-711	1,091.676	11:49 hr.	2.680	0.766	0.511
305	872	32-713	32-712	692.709	11:45 hr.	0.873	1.500	1.000
306	873	32-714	32-713	692.716	11:44 hr.	1.568	0.817	0.545
307	875	32-100	32-714	480.041	11:50 hr.	2.510	0.436	0.290
308	876	32-101	32-100	433.150	11:45 hr.	1.493	0.591	0.394
309	877	32-102	32-101	426.707	11:44 hr.	1.493	0.584	0.389
310	878	32-103	32-102	363.482	11:45 hr.	1.399	0.544	0.363
311	879	32-104	32-103	358.863	11:39 hr.	1.539	0.503	0.335
312	880	32-105	32-104	304.478	11:34 hr.	1.160	0.549	0.366
313	882	32-107	32-110	77.228	11:00 hr.	1.982	0.198	0.297
314	883	32-108	32-109	11.587	11:00 hr.	1.481	0.065	0.097
315	884	32-109	32-110	13.690	11:00 hr.	2.278	0.054	0.081
316	888	32-500	32-105	258.478	11:40 hr.	1.935	0.404	0.404
317	889	32-501	32-500	258.478	11:39 hr.	2.585	0.327	0.327
318	890	32-502	32-501	256.365	11:34 hr.	2.335	0.350	0.350
319	891	32-503	32-502	233.503	11:31 hr.	1.820	0.392	0.392
320	892	32-504	32-503	229.688	11:20 hr.	1.907	0.374	0.374
321	894	32-715	32-705	244.012	08:52 hr.	3.016	0.280	0.280
322	895	32-716	32-715	231.116	08:50 hr.	1.888	0.379	0.379
323	896	32-717	32-716	221.959	08:45 hr.	2.114	0.338	0.338
324	897	32-718	32-717	217.743	08:42 hr.	1.950	0.354	0.354

EXISTING SYSTEM FOR FUTURE WET WEATHER LOADS

ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
325	32-719	32-718	202.282	08:30 hr.	1.523	0.403	0.403
326	32-720	32-715	6.921	08:00 hr.	0.706	0.065	0.065
327	32-726	32-719	18.554	08:24 hr.	1.528	0.076	0.076
328	32-727	32-726	18.554	08:00 hr.	0.903	0.108	0.108
329	33-100	33-505	77.873	08:24 hr.	1.165	0.224	0.179
330	33-101	33-100	74.557	08:20 hr.	1.228	0.209	0.167
331	33-102	33-101	17.834	08:00 hr.	0.824	0.112	0.112
332	33-500	33-712	180.301	08:33 hr.	1.467	0.343	0.275
333	33-501	33-500	180.301	08:40 hr.	0.831	0.520	0.416
334	33-502	33-501	157.881	08:38 hr.	1.301	0.340	0.272
335	33-503	33-502	94.396	08:29 hr.	1.151	0.258	0.206
336	33-504	33-503	94.396	08:25 hr.	1.214	0.249	0.199
337	33-505	33-504	94.396	08:30 hr.	0.975	0.290	0.232
338	CYPRESS_CORR YPRESS_CORR_MYPRESS_CORR_W		1,047.587	11:00 hr.	9.174	0.326	0.261
339	CYPRESS_LAKES CYPRESS_LAKES YPRESS_LAKES_W		4,688.788	08:00 hr.	17.809	0.603	0.483

FUTURE SYSTEM WITH CIP IN PLACE

ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
1	45-500	44-703	1,674.966	09:00 hr.	2.150	1.083	0.541
2	33-555	33-554	144.786	08:40 hr.	7.903	0.092	0.074
3	33-556	33-554	1,927.745	11:50 hr.	3.173	1.074	0.716
4	33-557	33-556	1,925.935	11:50 hr.	3.023	1.123	0.749
5	33-558	33-557	1,923.787	11:49 hr.	3.003	1.129	0.753
6	33-560	33-559	1,909.388	11:44 hr.	4.503	0.791	0.527
7	33-561	33-560	1,908.461	11:50 hr.	4.224	0.832	0.555
8	33-562	33-561	671.654	08:45 hr.	4.576	0.361	0.240
9	33-563	33-562	665.371	08:45 hr.	2.078	0.636	0.424
10	33-564	33-563	658.929	08:44 hr.	2.071	0.633	0.422
11	33-565	33-564	653.545	08:45 hr.	2.058	0.632	0.421
12	33-566	33-565	649.071	08:40 hr.	2.027	0.636	0.424
13	33-573	33-555	144.786	08:38 hr.	0.741	0.481	0.385
14	33-574	33-573	124.098	08:29 hr.	1.258	0.294	0.235
15	33-575	33-574	124.098	08:05 hr.	1.204	0.303	0.242
16	33-576	33-575	124.098	08:00 hr.	1.136	0.316	0.253
17	33-577	33-576	0.000	00:00 hr.	0.000	0.000	0.000
18	33-578	33-577	0.000	00:00 hr.	0.000	0.000	0.000
19	33-700	34-533	239.273	08:30 hr.	1.291	0.399	0.228
20	33-701	33-700	239.273	08:28 hr.	1.386	0.380	0.217
21	33-702	33-701	234.925	08:01 hr.	0.455	0.845	0.483
22	33-710	33-709WW	317.641	08:44 hr.	1.378	0.545	0.436
23	33-711	33-710	217.192	08:43 hr.	1.556	0.376	0.301
24	33-712	33-711	217.192	08:39 hr.	1.558	0.376	0.301
25	33-752	33-710	83.049	08:29 hr.	1.417	0.204	0.163
26	33-755	33-752	60.785	08:28 hr.	1.083	0.198	0.158
27	33-756	33-755	56.881	08:20 hr.	1.032	0.196	0.157
28	33-758	33-756	50.517	08:05 hr.	1.096	0.173	0.138
29	33-759	33-758	2.107	08:00 hr.	1.067	0.021	0.017
30	34-503	34-502	4,572.934	08:29 hr.	2.979	1.643	0.657
31	34-504	34-503	4,578.299	08:30 hr.	3.128	1.577	0.631
32	34-505	34-504	4,581.010	08:29 hr.	4.243	1.750	1.000
33	34-506	34-505	4,562.890	08:29 hr.	4.227	1.750	1.000
34	34-507	34-506	4,563.995	08:35 hr.	4.228	1.750	1.000
35	34-508	34-507	4,279.518	08:34 hr.	3.964	1.750	1.000
36	34-509	34-508	4,265.335	08:35 hr.	3.951	1.750	1.000

FUTURE SYSTEM WITH CIP IN PLACE

	ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
37		34-510	34-509	4,263.692	08:35 hr.	3.949	1.750	1.000
38		34-511	34-510	2,114.142	08:35 hr.	3.549	0.946	0.541
39		34-533	34-532	239.273	08:49 hr.	1.157	0.431	0.246
40		42-103	42-102	120.075	08:19 hr.	1.989	0.228	0.228
41		42-102	42-101	120.075	08:24 hr.	2.046	0.223	0.223
42		42-101	42-100	120.075	08:25 hr.	2.049	0.223	0.223
43		42-100	42-340	120.075	08:23 hr.	1.975	0.229	0.229
44		42-300	33-625	606.133	08:45 hr.	3.903	0.406	0.325
45		42-301	42-300	568.887	08:45 hr.	2.043	0.631	0.504
46		42-302	42-301	568.898	08:44 hr.	2.405	0.556	0.444
47		42-303	42-302	568.916	08:40 hr.	2.052	0.628	0.503
48		42-304	42-303	569.004	08:40 hr.	2.633	0.519	0.415
49		42-305	42-304	569.068	08:39 hr.	2.393	0.558	0.446
50		42-306	42-305	472.508	08:40 hr.	5.579	0.290	0.290
51		42-307	42-306	472.517	08:40 hr.	5.516	0.292	0.292
52		42-308	42-307	260.127	08:54 hr.	3.798	0.249	0.249
53		42-316	42-300	28.632	08:14 hr.	1.241	0.117	0.117
54		42-317	42-316	28.632	08:00 hr.	1.146	0.123	0.123
55		42-330	42-307	212.409	08:40 hr.	4.439	0.193	0.193
56		42-331	42-330	212.410	08:40 hr.	1.608	0.401	0.401
57		42-332	42-331	207.634	08:39 hr.	1.812	0.361	0.361
58		42-333	42-332	203.835	08:39 hr.	1.875	0.347	0.347
59		42-334	42-333	200.034	08:34 hr.	1.716	0.365	0.365
60		42-335	42-334	196.239	08:34 hr.	1.694	0.364	0.364
61		42-336	42-335	196.239	08:30 hr.	1.825	0.344	0.344
62		42-337	42-336	137.842	08:35 hr.	2.129	0.239	0.239
63		42-338	42-337	137.842	08:34 hr.	2.090	0.242	0.242
64		42-339	42-338	132.908	08:28 hr.	2.036	0.241	0.241
65		42-340	42-339	132.908	08:24 hr.	2.016	0.242	0.242
66		42-341	42-305	96.575	08:15 hr.	1.637	0.224	0.224
67		42-342	42-341	60.948	08:00 hr.	1.700	0.158	0.158
68		53-703	53-702	294.352	10:54 hr.	2.136	0.373	0.298
69		53-704	53-703	294.352	10:54 hr.	1.938	0.400	0.320
70		42-500	42-103	102.739	08:17 hr.	2.110	0.196	0.196
71		42-501	42-530	46.294	08:22 hr.	1.604	0.136	0.136
72		42-502	42-501	46.294	08:00 hr.	1.579	0.138	0.138

FUTURE SYSTEM WITH CIP IN PLACE

	ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hr)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
73	1396	42-700	42-308	260.128	08:51 hr.	1.857	0.419	0.419
74	1397	42-701	42-700	242.179	08:49 hr.	2.898	0.287	0.287
75	1400	42-704	42-701	240.970	08:45 hr.	3.082	0.274	0.274
76	1401	42-705	42-704	204.466	08:43 hr.	1.768	0.363	0.363
77	1402	42-706	42-705	204.466	08:45 hr.	1.762	0.364	0.364
78	1404	42-708	42-709	109.474	11:19 hr.	1.969	0.257	0.385
79	1405	42-709	42-718	136.726	10:30 hr.	2.104	0.289	0.433
80	1415	42-718	42-719	138.545	10:36 hr.	2.012	0.302	0.452
81	1416	42-719	42-724	142.978	10:40 hr.	2.114	0.298	0.446
82	142	54-100	44-510	328.042	08:41 hr.	4.973	0.242	0.242
83	1420	42-723	42-706	203.872	08:39 hr.	1.911	0.342	0.342
84	1421	42-724	42-723	183.070	08:40 hr.	3.565	0.203	0.203
85	1424	42-727	42-723	17.004	08:00 hr.	0.976	0.112	0.168
86	143	54-101	54-100	293.590	08:39 hr.	3.906	0.266	0.266
87	144	54-102	54-101	293.590	08:35 hr.	2.725	0.345	0.345
88	1444	28-502	BETHEL_ISLE_PS	2,129.599	08:00 hr.	6.041	1.000	1.000
89	145	54-103	54-102	227.709	08:34 hr.	5.014	0.187	0.187
90	146	54-104	54-103	227.709	08:29 hr.	3.282	0.251	0.251
91	147	54-105	54-104	227.709	08:25 hr.	2.221	0.333	0.333
92	148	54-106	54-105	77.244	08:10 hr.	1.695	0.187	0.187
93	149	54-107	54-106	77.244	08:05 hr.	1.652	0.190	0.190
94	151	54-109	54-110	0.000	00:00 hr.	0.000	0.000	0.000
95	17	45-517	QUAIL_VALLEY_PS	447.726	08:40 hr.	4.780	0.311	0.311
96	171	54-300	55-123.1	356.218	08:49 hr.	2.367	0.397	0.318
97	172	54-301	54-300	355.049	08:55 hr.	2.222	0.415	0.332
98	173	54-302	54-301	347.126	08:54 hr.	1.506	0.545	0.436
99	174	54-303	54-302	338.929	08:54 hr.	1.734	0.481	0.385
100	175	54-304	54-303	336.030	08:50 hr.	1.729	0.479	0.383
101	176	54-305	54-304	328.882	08:50 hr.	1.360	0.565	0.452
102	177	54-306	54-305	311.336	08:43 hr.	1.696	0.459	0.368
103	178	54-307	54-306	311.336	08:20 hr.	1.695	0.460	0.368
104	194	54-500	54-107	77.244	08:00 hr.	1.720	0.185	0.185
105	195	54-501	54-500	0.000	00:00 hr.	0.000	0.000	0.000
106	196	54-502	54-501	0.000	00:00 hr.	0.000	0.000	0.000
107	2	45-501	45-500	1,675.621	08:55 hr.	1.899	1.199	0.599
108	200	43-100	43-311	453.064	08:43 hr.	1.907	0.638	0.638

FUTURE SYSTEM WITH CIP IN PLACE

ID	From ID	To ID	Maximum Flow (gpm)	Maximum Flow Time (hour)	Maximum Velocity (ft/s)	Maximum Water Depth (ft)	Maximum d/D
109	53-101	43-593	146.718	08:00 hr.	2.384	0.277	0.415
110	57	9000	433.198	08:05 hr.	2.656	0.471	0.471
111	59	61	429.892	08:00 hr.	2.581	0.478	0.478
112	61	57	433.198	08:10 hr.	2.178	0.551	0.551
113	43-101	43-100	453.065	08:40 hr.	1.676	0.616	0.493
114	67	5030	211.387	11:00 hr.	0.864	0.833	1.000
115	5003	5024	428.590	08:54 hr.	3.007	0.382	0.306
116	42-752	42-751	43.088	08:00 hr.	1.079	0.171	0.171
117	43-102	43-101	445.752	08:35 hr.	2.993	0.394	0.315
118	42-751	42-750	43.088	08:25 hr.	1.831	0.119	0.119
119	42-750	42-749	43.088	08:10 hr.	1.431	0.140	0.140
120	42-749	42-748	43.088	08:18 hr.	1.108	0.167	0.167
121	42-748	42-386	43.088	08:19 hr.	0.988	0.181	0.181
122	42-386	42-385	58.397	08:24 hr.	1.274	0.188	0.188
123	42-385	42-336	58.397	08:35 hr.	1.339	0.181	0.181
124	5022	5026	543.463	09:00 hr.	3.214	0.432	0.346
125	5024	5002	545.445	08:55 hr.	3.217	0.433	0.347
126	5026	5028	716.989	08:54 hr.	3.467	0.502	0.402
127	5028	55-123.1	781.722	08:54 hr.	2.466	0.699	0.560
128	5030	32-714	211.387	11:05 hr.	2.331	0.375	0.562
129	42-530	42-500	102.739	08:20 hr.	1.914	0.210	0.210
130	50025	50027	0.000	00:00 hr.	0.000	0.000	0.000
131	50029	50031	119.838	08:24 hr.	1.554	0.271	0.271
132	50027	50029	119.838	08:00 hr.	1.506	0.277	0.277
133	50031	32-719	183.728	08:34 hr.	2.254	0.344	0.516
134	50033	63	225.073	11:00 hr.	1.808	0.422	0.507
135	63	32-504	225.073	11:27 hr.	2.363	0.390	0.585
136	7000	34-510	0.000	00:00 hr.	0.000	0.000	0.000
137	43-107	43-102	439.849	08:40 hr.	1.793	0.571	0.457
138	62	64	8,978.912	08:55 hr.	3.685	2.152	0.717
139	64	66	8,982.452	08:54 hr.	3.669	2.162	0.721
140	66	68	8,979.956	08:54 hr.	3.660	2.166	0.722
141	68	70	8,978.325	08:54 hr.	3.409	2.321	0.774
142	44-308	62	1,728.915	09:00 hr.	3.606	0.746	0.373
143	70	84	8,976.637	08:59 hr.	2.829	3.000	1.000
144	84	80	8,973.498	09:10 hr.	4.126	1.944	0.648



APPENDIX B

Pipeline Costing

Appendix B

Pipe Dia (in)	\$/LF/Dia	Year/ SFENR CCI	\$/LF/Dia (SFENR 6695)	Reference
6	\$18	2002/7662	\$16	PVWMA Accelerated Pipeline & Supplemental Wells Bids
8	\$12	2002/7662	\$10	
10	\$13	2002/7662	\$11	
12	\$9	2002/7662	\$8	
16	\$8	2002/7662	\$7	
24	\$17	2002/7662	\$15	
8	\$8	1996/6550	\$8	Contra Costa Water District Master Plan
12	\$7	1996/6550	\$7	
6	\$24	2002/7684	\$21	City of Milpitas Utility Depreciation Study
8	\$19	2002/7684	\$17	
10	\$17	2002/7684	\$15	
12	\$15	2002/7684	\$13	
15	\$13	2002/7684	\$11	
16	\$13	2002/7684	\$11	
18	\$13	2002/7684	\$11	
21	\$12	2002/7684	\$10	
24	\$12	2002/7684	\$10	
27	\$12	2002/7684	\$10	
30	\$12	2002/7684	\$10	
8	\$9	1992/6226	\$8	SCSD 1992 Master Plan
10	\$7	1992/6226	\$6	
12	\$6	1992/6226	\$6	
15	\$6	1992/6226	\$6	
18	\$5	1992/6226	\$5	
21	\$5	1992/6226	\$5	
24	\$5	1992/6226	\$5	
27	\$5	1992/6226	\$5	
30	\$5	1992/6226	\$5	
10	\$20	2002/7660	\$17	Harcourt Avenue Sewer Main Replacement
12	\$13	2000/6474	\$13	Sacramento Sewage Facilities Expansion MP
15	\$11	2000/6474	\$11	
18	\$11	2000/6474	\$11	
21	\$9	2000/6474	\$9	
24	\$9	2000/6474	\$9	
27	\$11	2000/6474	\$11	
30	\$10	2000/6474	\$10	
6		2003/6695	\$19	Average for each pipe size
8		2003/6695	\$12	
10		2003/6695	\$13	
12		2003/6695	\$10	
15		2003/6695	\$10	
16		2003/6695	\$10	
18		2003/6695	\$10	
21		2003/6695	\$9	
24		2003/6695	\$10	
27		2003/6695	\$9	
30		2003/6695	\$10	
Average		2003/6695	\$12	Average for all pipe sizes