Final Report

MASTER PLAN FOR

City of Los Banos
At the Crossroads of California

Wastewater Collection System

Amended March 2010

SEPTEMBER 2008

carollo

Engineers...Working Wonders With Water®

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March 31, 2010
7833A03

City of Los Banos
411 Madison Avenue
Los Banos, California 93635

Attention: Mr. Mark Fachin, P.E.

Subject: City of Los Banos Final Wastewater Collection System Master Plan
Amended March 2010

Dear Mr. Fachin:

We are pleased to submit 10 copies of the amended final report for the City of Los Banos (City) Wastewater Collection System Master Plan (Master Plan). The Master Plan includes: planning assumptions, the collection system evaluation, and recommended improvements to correct existing deficiencies and to serve future customers. This amended report incorporates the recent changes to land use assumptions and planning boundaries described in the City's 2030 General Plan Update.

Adjustments to the phasing of recommended improvements have also been included to account for the recent slowdown in development and current economic conditions. If economic, development and/or funding conditions change, then the City should revisit the phasing assumptions and consider implementing the recommended improvements at an earlier date, in particular, those that mitigate existing deficiencies.

We would like to extend our thanks to you, Mr. Gary Hutsell, Assistant Public Works Director; and other City staff whose courtesy and cooperation were valuable components in ensuring that this document will assist the City in planning infrastructure improvements to serve its customers.

Sincerely,

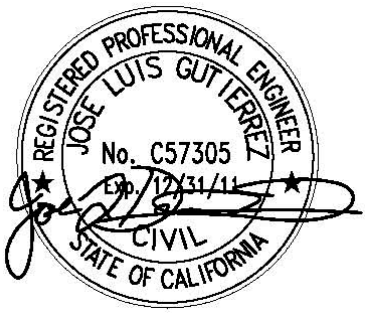
CAROLLO ENGINEERS, P.C.

David L. Stringfield, P.E.

Jose L. Gutierrez, P.E.

DLS:JLG:asw

Enclosures: Amended Final Wastewater Collection System Master Plan (10)



City of Los Banos

WASTEWATER COLLECTION SYSTEM MASTER PLAN

Amended March 2010
September 2008

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City of Los Banos

WASTEWATER COLLECTION SYSTEM
MASTER PLAN

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WASTEWATER COLLECTION SYSTEM MASTER PLAN

ES.1 INTRODUCTION

The City of Los Banos (City) is located in western Merced County (County), in the northern portion of the San Joaquin Valley. The City is located near the junction of California State Route (SR)-152 and Interstate 5. Los Banos is the second largest city in the County. The City collects, treats, and disposes wastewater originating from the residential, commercial, institutional, and industrial dischargers within the service area. The City owns, maintains, and operates all wastewater facilities within the service area.

The City's collection system includes sanitary sewer lines that span 4- to 30-inches in diameter, and 13 lift stations. In addition to the collection system, the City also operates a wastewater treatment plant (WWTP) located northeast of the City. As a separate project, the City is currently designing upgrades to the existing WWTP. The improvements to the existing WWTP are not discussed in this report since the focus of this Master Plan was the wastewater collection system.

ES.2 STUDY AREA

The City's 2030 General Plan Update (2030 General Plan) sphere of influence (SOI) is the study area boundary for this wastewater collection system master plan (Master Plan). The Master Plan area study boundary and SOI are synonymous and will be used interchangeably throughout this report. The SOI boundary extends far beyond the current wastewater collection service area and is approximately 14,382 acres (22.5 square miles). The Master Plan contains a forecast of sewer improvements in a large study area beyond the City limits. Figure ES.1 shows the study area boundary and the City's limits. Evaluating infrastructure needs beyond the City limits is important because: there are conceptual development plans that are beyond the City limits; recent rapid growth in the San Joaquin Valley indicates that significant development into the study area could occur within a short planning period; and by forecasting the ultimate, orderly expansion of the sewer system, there is a greater utilization of reliable gravity sewers.

ES.3 EXISTING AND FUTURE SERVICE AREA

The land use designations (residential, commercial, etc.) used in this Master Plan are consistent with the City's 2030 General Plan. The type of land use in an area will affect the volume, including daily variation of the wastewater generated.

The City currently provides sewer service to approximately 4,582 acres (includes developed and undeveloped land) or 7.2 square miles. Note that the acreage total does not include

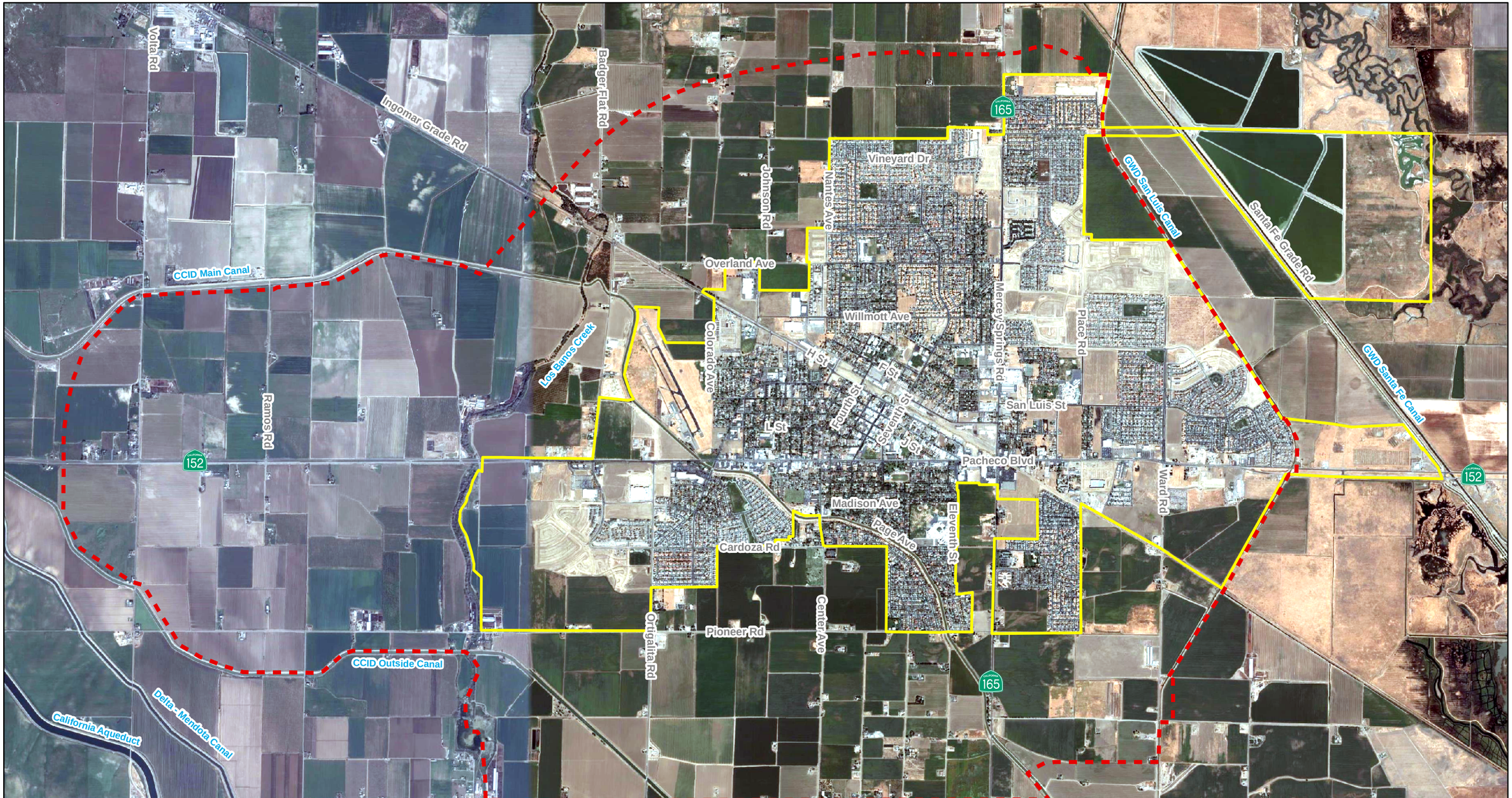


Figure ES.1
Study Area
Wastewater Collection System Master Plan
City of Los Banos

1. Sphere of Influence from City of Los Banos 2030 General Plan Update, Dyett & Bhatia, July 15, 2009

land occupied by the WWTP because the treatment plant is located outside of the SOI. The largest land use category is residential (low, medium, and high), which accounts for approximately 2,279 acres, or approximately 50 percent of the total acreage. Commercial, office/professional, and industrial make up approximately 925 acres, or 20 percent of the total. Civic/Institutional makes up approximately 181 acres, or 4 percent. Non-wastewater generating land uses like parks, streets, and open space land uses account for 1,197 acres, or 26 percent of the total service area.

At build-out of the SOI boundary, the City will serve approximately 14,382 acres or 22.5 square miles, which is about three times the current service area. Build-out is defined as complete development of all lands. Residential will continue to represent the largest land use category in the City and will make up approximately 38 percent of the total acreage.

ES.4 HISTORICAL AND FUTURE POPULATION

The City's population began to grow quickly after World War II owing to returning veterans and highway construction[1]. A series of irrigation and dam projects in the 1960s brought more people to the City, however, growth slowed from 1970 to 1985. In 1990, the City's population began to grow rapidly and continued through year 2007. From 1990 through the present, the population grew from approximately 14,500 to 35,200. Over the last 20 years, the City has grown at an annual rate of about 5.1 percent.

The 2030 General Plan states that the build-out population will reach approximately 90,400 people. This build-out population reflects an annual growth rate that ranges between 4.1 to 4.6 percent. Table ES.1 summarizes the existing and projected year 2030 population.

Table ES.1 Existing and Projected Year 2030 Population
Wastewater Collection System Master Plan
City of Los Banos

Year	Population
2007	35,200
2030	90,400

Note:
1. Source of historical data: City of Los Banos 2030 General Plan Update, July 2009.

ES.5 WASTEWATER DESIGN FLOWS

The design flow is the maximum hourly flow rate at the WWTP under selected design storm and growth conditions. Design flow is the sum of peak wastewater flows and inflow/infiltration (I/I) resulting from a selected design storm (10-year, 24-hour).

Since the collection system provides service to industrial dischargers, the calculation of the design flows accounted for these dischargers. The maximum industrial discharge was added to the design flow. The maximum industrial discharge was the recorded average hourly flow for the maximum month. By including the maximum month flow for each industry, not only does the design flow account for the 10-year, 24-hour design storm, but it also includes the maximum industrial discharge flow. This approach supports our confidence that we are modeling the maximum flow condition that could occur in the sewer system.

In summary, the design flow consists of three components:

- Average day flow
- Wet weather inflow and infiltration
- Maximum industrial discharge

Table ES.2 presents the current average day and design flow for the service area. Also shown are the forecast average day and design flow at build-out of the City's SOI boundary.

Table ES.2 Current and Projected Wastewater Flows
Wastewater Collection System Master Plan
City of Los Banos

	Average Day Flow[2] (mgd)	Design Flow (mgd)	Peaking Factor
Current[1]	3.55	6.1[1]	1.7
SOI build-out	11.0	18.7	1.7

Notes:
1. Based on meter data from Sanitary Sewer Flow Monitoring, September 2007.
2. Assumes average industrial flow, not maximum month.

ES.6 CAPACITY EVALUATION AND PROPOSED IMPROVEMENTS

The capacity analysis entailed identifying areas in the collection system where flow restrictions occur or where pipe capacity is insufficient to convey design flows. Sewers that lack sufficient capacity to convey design flows could produce backwater effects in the sewer system and potentially cause sanitary sewer overflows (SSOs).

The hydraulic modeling analysis identified locations of existing and future hydraulic deficiencies resulting from flows exceeding the maximum flow depth (d) to pipe diameter ratio (D) (d/D) criteria and from lift stations lacking the firm capacity to convey design flow.

Most of the existing wastewater collection system has sufficient capacity to convey existing design flows. However, in some locations, such as the City's downtown, existing storm

[1] City of Los Banos 2030 General Plan Administrative Draft, June 2007, Dyett & Bhatia

drain connections cause sudden increases in wastewater flow during a storm event. The storm water inflow could cause a few sewers to surcharge and potentially overflow during a large storm. The City had the option to either upsize the sanitary sewer system to convey storm water runoff, or to construct storm drain pipelines and separate the storm runoff from the wastewater system. City staff made the decision to implement storm drain projects to separate storm runoff from the wastewater collection system. These projects are discussed in Chapter 6 of this Master Plan and in more detail in the Storm Drainage Master Plan. Implementing the storm drain projects achieved multiple benefits including reducing wastewater flow to the WWTP, relieving flooding in the downtown area, and eliminating wastewater capital projects. The projects presented in this Master Plan assume that downtown storm drain projects would also be implemented.

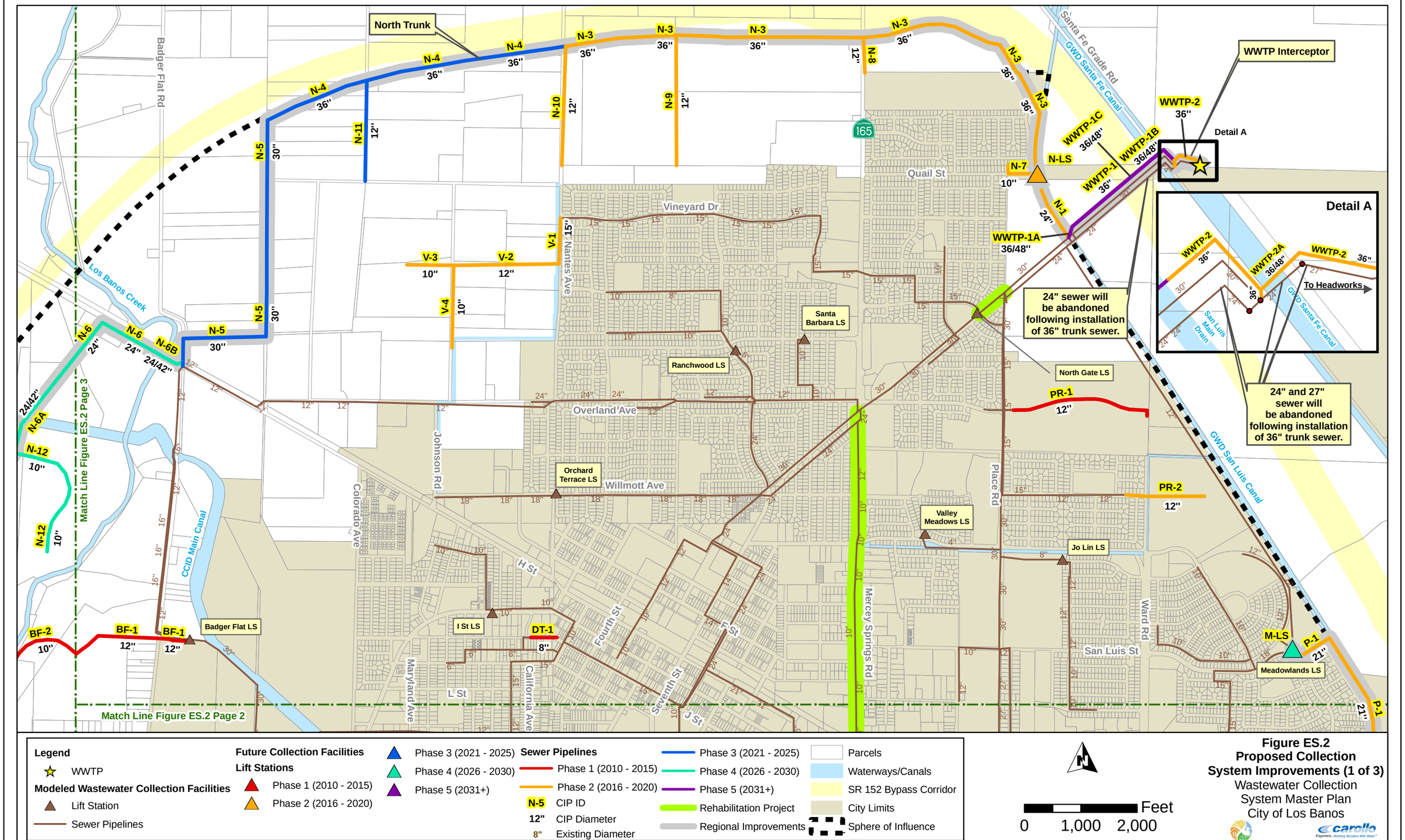
The proposed improvements that will serve future users are sized for build-out conditions. As the City continues to grow beyond its current limits, it is recommended that the pipeline diameters and pump station capacities proposed in this Master Plan be constructed so that the facilities have sufficient capacity for build-out conditions. Building a smaller interim project with the plans of upsizing in the future to account for further growth is not recommended. In this Master Plan, the proposed pipe diameter represents the ultimate diameter for build-out conditions.

Figure ES.2 (three pages) illustrates the proposed improvements necessary to correct the existing deficiencies and to serve future users. Figure ES.2 shows the proposed improvements in different categories (colors). The different colors identify the implementation timeframe of the improvements and differentiate between near-term and long-term improvements.

ES.6.1 Existing Versus Future Improvements

The vast majority of the Master Plan improvements will serve future users, even when an improvement calls for the upgrade of an existing facility. In these cases, an existing sewer or lift station may have sufficient capacity to convey current design flows, but as growth continues and more users are added to the system, the increased flow results in capacity deficiencies. These are labeled future improvements. There are several rehabilitation and replacement projects that are intended to restore existing infrastructure, and these are listed as existing improvements. The future improvements were broken down further based on their funding source. Future improvements will be funded by developers or through development impact fees. All projects fall into one of the three following categories:

- Existing Improvements: Existing improvements correct existing deficiencies or rehabilitate/replace existing facilities that have reached their useful life. These projects are funded through user rates.
- Developer Improvements: Future improvements that serve new users. These improvements will be developer funded and/or may be part of a reimbursement agreement between developers.



Legend

- WWTP
- **Modeled Wastewater Collection Facilities**
  - Lift Station
  - Sewer Pipelines
- **Future Collection Facilities**
- **Lift Stations**
  - Phase 1 (2010 - 2015)
  - Phase 2 (2016 - 2020)
  - Phase 3 (2021 - 2025)
  - Phase 4 (2026 - 2030)
  - Phase 5 (2031+)
- **Sewer Pipelines**
  - Phase 1 (2010 - 2015)
  - Phase 2 (2016 - 2020)
  - N-5 CIP ID
  - 12" CIP Diameter
  - 8" Existing Diameter
- Phase 3 (2021 - 2025)
- Phase 4 (2026 - 2030)
- Phase 5 (2031+)
- Rehabilitation Project
- Regional Improvements
- Parcels
- Waterways/Canals
- SR 152 Bypass Corridor
- City Limits
- Sphere of Influence

N

0 1,000 2,000 Feet

Figure ES.2
Proposed Collection System Improvements (1 of 3)
Wastewater Collection System Master Plan
City of Los Banos

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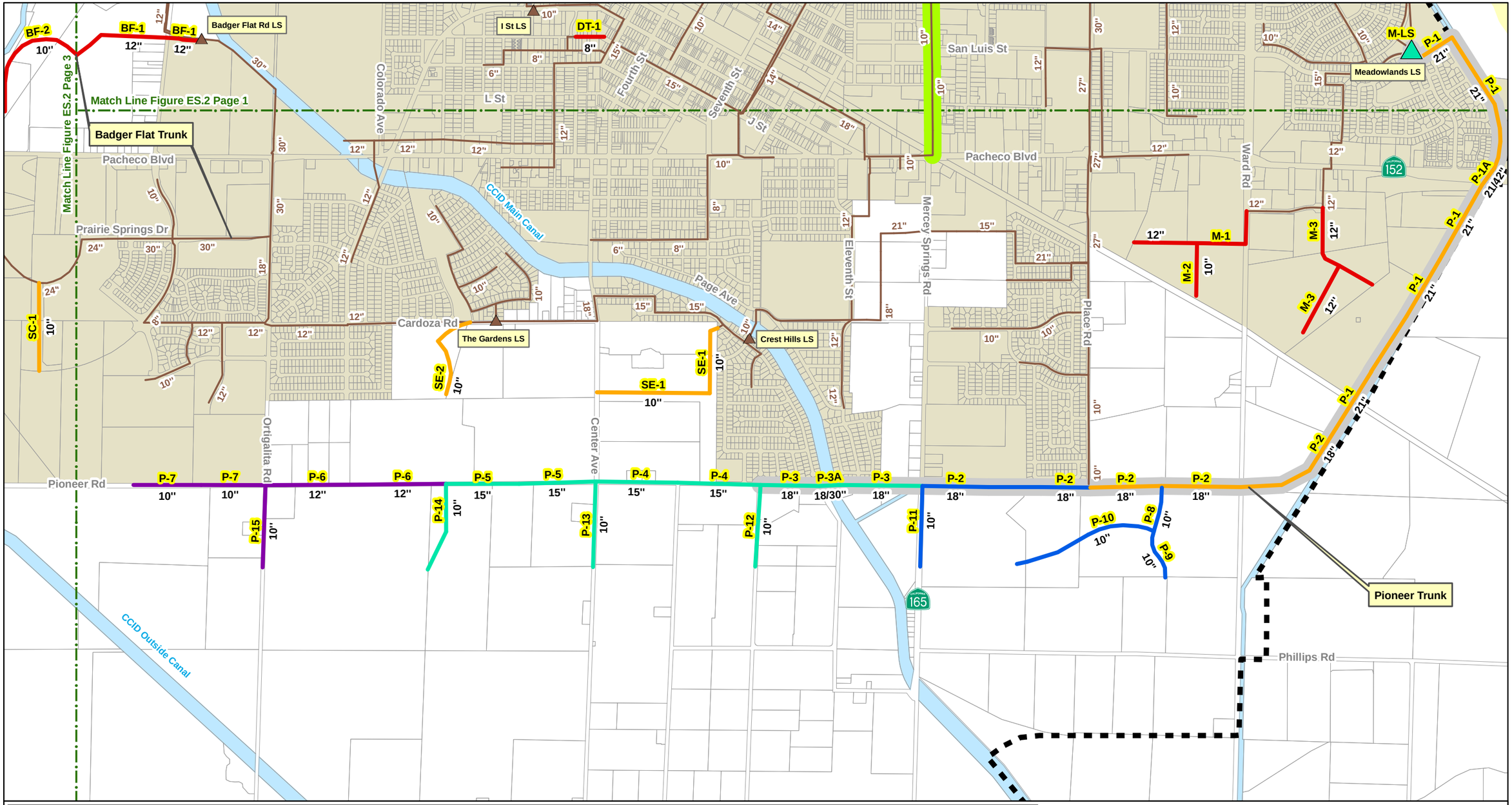

Figure ES.2
Proposed Collection System Improvements (2 of 3)
Wastewater Collection System Master Plan
City of Los Banos

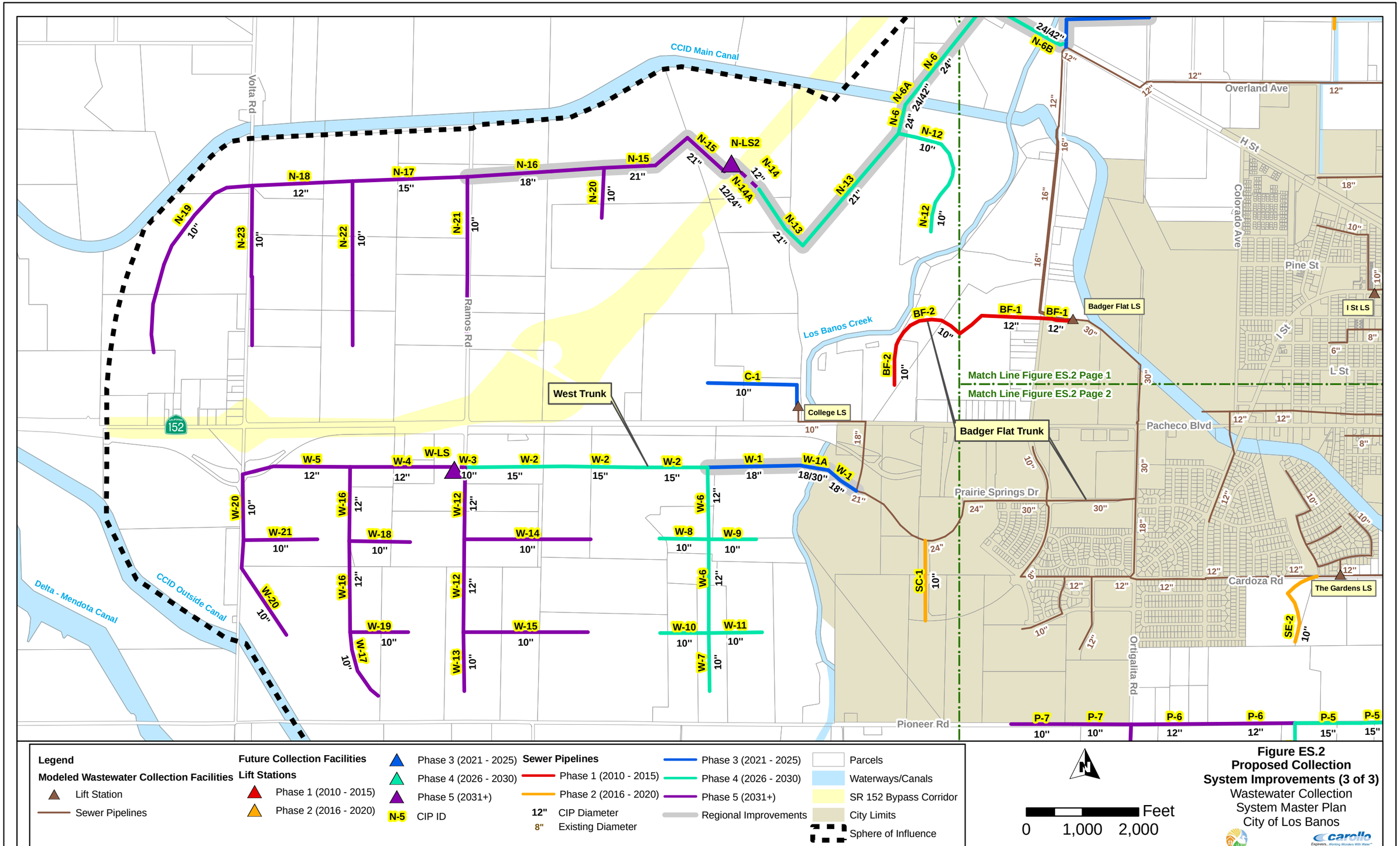

Figure ES.2
Proposed Collection System Improvements (3 of 3)
Wastewater Collection System Master Plan
City of Los Banos

- Regional Improvements: Future improvements that serve new users. These improvements will be funded through wastewater development impact fees collected by the City.

The majority of future improvements are Developer Improvements, but sewers that were 18-inch diameter and larger were designated Regional Improvements. The Regional Improvements are shown in Figure ES.2.

ES.6.2 Lift Station Improvements

The City's Improvement Standards require that all sewage lift stations have two non-clog sewer pumps, each capable of pumping 100 percent of the design flowrate. In other words, each lift station's firm capacity should be sufficient to pump 100 percent of the design flowrate. Each lift station's firm capacity was compared to the existing and build-out design flow conveyed to the lift station. If the design flow was greater than the lift station's firm capacity, then the lift station was considered deficient and required upgrade.

The majority of lift stations contain sufficient firm capacity to convey existing and build-out design flows. However, the Meadowlands lift station will require upgrade to convey build-out design flows.

ES.6.3 Benefits of Storm Drain Projects to Wastewater System

The downtown area of the City experiences sudden increases in flow following large storm events. Previous master plans prepared by the City identified several storm drain connections to the collection system that cause this increase in flow. This Master Plan concluded that if the City implements storm drain projects to separate these inflow connections, then a large downtown wastewater sewer project could be avoided. The City should proceed with the downtown storm drain projects presented in Chapter 6 of the Master Plan and analyzed in more detail in the 2008 Storm Drainage Master Plan.

There are cost savings for the wastewater system associated with implementing the storm drain projects. The City reduces the capital costs required to install large diameter sewers necessary to convey combined sanitary and storm water flows. Our analysis concluded that if storm water runoff continues to flow to the collection system, then 4,200 feet of 24-inch diameter sewer would be constructed to relieve the existing downtown sewers. This 24-inch diameter sewer would jog through several downtown streets, including 3rd, 4th, H, and D Streets. Constructing this sewer would cost approximately $1.6 million and would likely be disruptive to downtown traffic and businesses.

By implementing the storm drain projects, there is also a reduction in peak flows conveyed through the collection system that ultimately reaches the WWTP. Our analysis indicated that peak flows could reduce by as much as 2.0 mgd by removing the storm drain connections. Reducing the peak flows has many benefits, including freeing up capacity in the existing trunk sewers, the Central and WWTP interceptors, and reducing the size

(diameter) of the capital projects. Reduction in peak flows also benefit the WWTP and planned improvements to the headworks. By freeing up capacity, the implementation of the improvements identified in this Master Plan was deferred to the timeframes shown. If storm runoff continued to be conveyed to the wastewater collection system, then implementation of the capital projects would be scheduled at earlier dates. The future capital projects would also be more costly, because the size of pipe required to convey storm runoff and future flows would be greater.

The State Water Resources Control Board (SWRCB) recently adopted (May 2, 2006) the Statewide General Waste Discharge Requirements (WDR) for Sanitary Sewer Systems. The purpose of the WDR is to reduce SSOs. Large increases in sewer flow following a storm could result in SSOs. Identifying and removing the storm connections to the sewer system will reduce the likelihood of SSOs.

The proposed storm drain improvements that separate runoff from the wastewater collection system are shown in Figure ES.3. The capital cost for these projects were included in this Master Plan since they benefit the wastewater collection system.

ES.6.4 Sewer Main Replacement or Rehabilitation

The City identified the 10-inch and 12-inch diameter Mercey Springs trunk sewer as deteriorated. Deteriorated sewers are often corroded and susceptible to collapse. This study did not conduct a condition assessment to evaluate the structural integrity of existing sewers, nor did it evaluate rehabilitation alternatives for existing sewers. However, based on input from City staff, we are including rehabilitation of this and other sewers as capital projects. For the purposes of budgeting, we assumed that the City would implement various rehabilitation projects through the year 2035.

The capital improvements also assumed that the City would replace about 0.25 miles of sewer every year. The weighted average diameter of all sewers in the collection system is 10-inches. Therefore, in order to develop a capital cost, we assumed that about 0.25 miles of 10-inch diameter sewer would be replaced every year through 2035.

ES.6.5 Lift Station Replacement or Rehabilitation

Lift station replacement or rehabilitation will be necessary to maintain proper operation of existing facilities. We assumed that lift stations would be rehabilitated or replaced every five years. For budgeting purposes, we assumed replacement of the older lift stations, which range in capacity from 200 to 3,000 gpm, and average approximately 600 gpm. We also assumed that four lift stations would be rehabilitated or replaced by year 2030.

ES.7 CAPITAL PROJECT PRIORITIZATION

The majority of improvements listed in this Master Plan are driven by future development. Most of the improvements are new sewers and lift stations that serve future growth, but

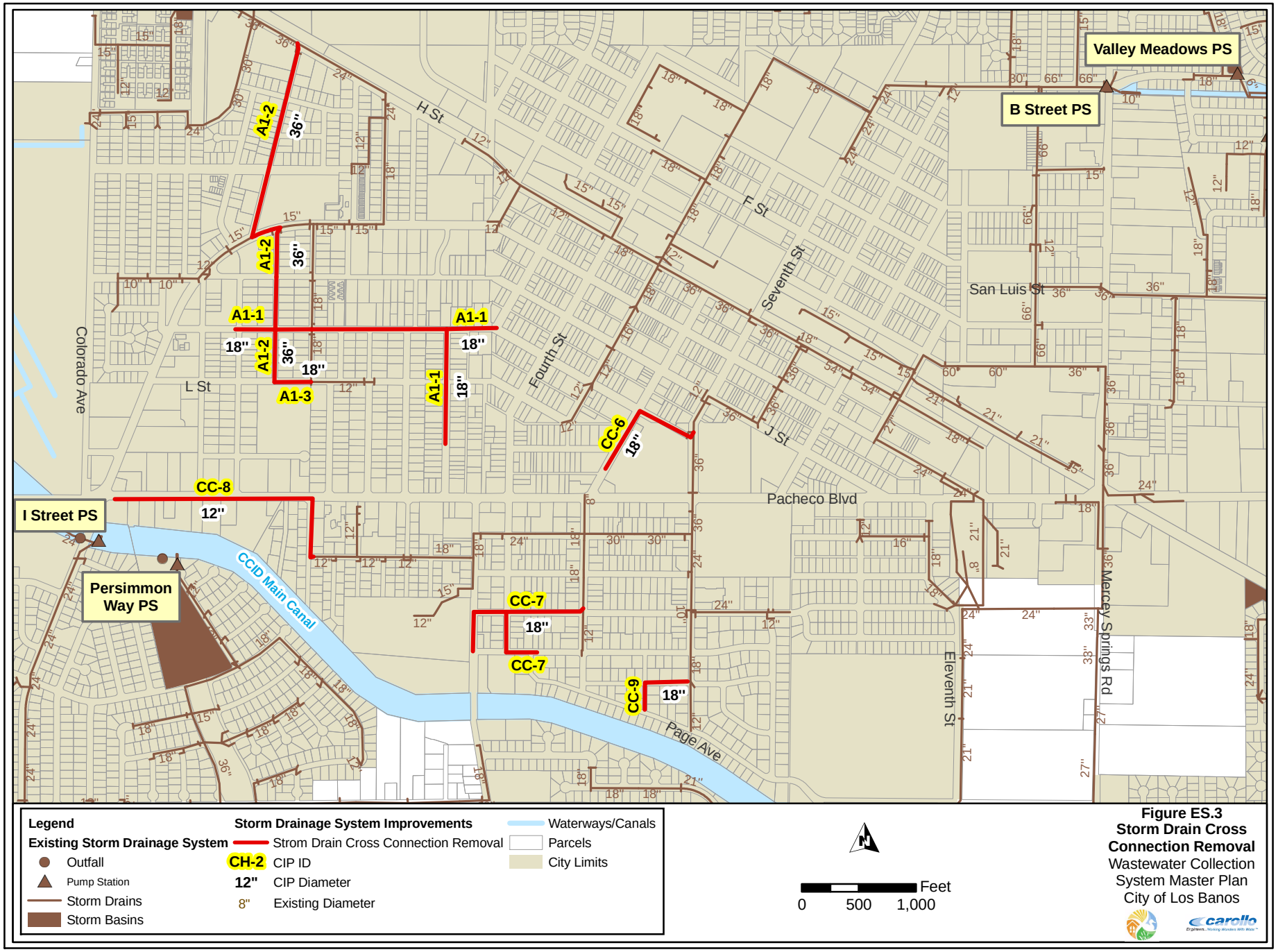

Figure ES.3
Storm Drain Cross Connection Removal
Wastewater Collection System Master Plan
City of Los Banos

there are some improvements to existing facilities that resulted from future growth. When fully implemented, the capital projects will allow the conveyance of design flows to the WWTP during build-out conditions.

Prioritizing the required capital improvements for the City's sewer system is an important aspect of the Master Plan. The improvement projects were prioritized based on the following factors:

- Upgrading existing sewers or lift stations to serve future users
- Eliminating storm runoff into the collection system
- Building the sewers necessary to serve future users

ES.7.1 Existing System Improvement Prioritization

The storm drain projects that reduce storm inflow into the wastewater collection system are high priority projects. These include the Airport No. 1 subbasin storm drain projects (A1-1, 2 and 3) and the Central City subbasin storm drain projects (CC-6 through CC-9).

Due to economic conditions and the slowdown in development, the probability and practicality of constructing all these improvements in the next five years is low. For this reason, the improvements were distributed amongst all phases according to priority and level of benefit provided to the existing system.

Improvements to existing sewers and lift stations will provide sufficient capacity to convey increased flows resulting from new development.

ES.7.2 Future System Improvement Prioritization

Future development will require the construction of sewers to serve new users. The implementation of these improvements will depend on the City's growth and selection of areas to be served with urban infrastructure. The City provided guidance on future development and phasing of infrastructure to serve future users. Based on this input, the projects were grouped into the following timeframes:

- Years 2010 through 2015
- Years 2016 through 2020
- Years 2021 through 2025
- Years 2026 through 2030
- Beyond 2031

Proposed improvements within areas identified for early development were assigned a higher priority. Areas within an approved tentative map tract received the highest priority. The actual implementation of the improvements serving future users depends on growth. The priorities presented below are estimates based on available information provided by

the City. Changes in the City's planning assumptions or growth projections could increase or decrease the priority of each improvement.

ES.7.3 Phase 1 Projects (2010-2015)

The highest priority projects include the first reach of the Pioneer trunk sewer (P-1) and the Provinces trunk sewer (PR-1). The Provinces trunk sewer will serve a new residential development between Place and Ward Road, north of Willmott Road. The Pioneer trunk sewer will serve an industrial redevelopment area south of Highway 152 and east of Ward Road. The design phase of the Pioneer trunk sewer could start in Phase 1, but the construction of the first reach of the sewer will likely span into Phase 2 (2016-2020).

The Phase 1 projects include the following:

- Downtown Sewer Main (DT-1)
- Pioneer Trunk (P-1 and P-1A)
- Meadowlands Trunk (M-1, M-2, and M-3)
- Provinces Trunk (PR-1 and PR-2)
- Badger Flat Trunk (BF-1 and BF-2)
- Stone Creek Trunk (SC-1)

ES.7.4 Phase 2 Projects (2016-2020)

The Phase 2 projects will serve new development in the growth areas targeted by the City. All the Phase 2 projects will likely be implemented between 2016 and 2020. Some of the projects identified within Phase 2 are part of a larger capital project. For example, the first three reaches of the North trunk sewer (N-1, N-2, and N-3) and the lift station are targeted as the first segments of this sewer to be constructed. Several branches of the North trunk (N-7 through N-10) are also identified as Phase 2 projects.

The Phase 2 projects include the following:

- Pioneer trunk (P-1, P-1A, P-2)
- North trunk and lift station (N-1, N-3, and N-LS)
- Vineyard trunk (V-1 through V-4)
- Southeast trunk (SE-1 and SE-2)
- Wastewater Treatment Plant trunk (WWTP-2 and WWTP-2A)
- On going sewer main rehabilitation and replacement, manhole replacement, and lift station rehabilitation or replacement

ES.7.5 Phase 3 Projects (2021-2025)

The Phase 3 projects will serve future development beyond year 2020. These projects are within the ten-year window identified by the City. Many of the projects are continuations of

sewers that were started in Phase 1 and 2. For example, P-2 represents the second phase of the Pioneer trunk sewer. The Phase 3 projects include the following:

- Pioneer trunk (P-2, P-8 through P-11)
- College trunk (C-1)
- West trunk (W-1 and W-1A)
- Meadowlands lift station (M-LS)
- North Trunk (N-4 and N-5)
- On going sewer main rehabilitation and replacement, manhole replacement, and lift station rehabilitation or replacement

ES.7.6 Phase 4 and 5 Projects (2026 and beyond)

For the purposes of prioritization, these are viewed as very long-term, low priority projects, and will be grouped together. The Phase 4 and 5 projects include the following:

- Wastewater Treatment Plant trunk (WWTP-1 through WWTP-1C)
- Pioneer trunk (P-3 through P-7, and P-12 through P-15)
- North trunk (N-6 through N-23, and N-LS2)
- West trunk and lift station (W-2 through W-21, W-LS)
- On going sewer main rehabilitation and replacement, manhole replacement, and lift station rehabilitation or replacement

ES.8 CAPITAL PROJECT COSTS

A summary of the capital project costs is presented in Table ES.3. The table also shows the probable phase in which the project would be implemented. The implementation timeframe was based on the priority of each project to correct existing deficiencies or to serve future users. The future improvements are broken down further into Regional or Developer Improvements. The difference between these two is the funding source. The breakdown in existing and future user cost share by phase is presented in Table ES.4

Table ES.3 Capital Improvement Projects

Wastewater Collection System Master Plan

City of Los Banos

Figure No.	Type of Improvement	Description/ Street	Description / Limits	Project Length/Size and Cost: Ex. Size/ Diam. (in)	New Size/ Diam. (in)	Replace/ New	Length (ft)	Capital Improvement Cost[2],[3] ($)	Capital Improvement Phasing: Phase 1 2010-15 ($)	Phase 2 2016-20 ($)	Phase 3 2021-2025 ($)	Phase 4 2026-2030 ($)	Phase 5 2031+ ($)	Future Users Benefit (%)	Improvement Reimbursement Category: Existing Improvements ($)	Future Improvements: Developer ($)	Future Improvements: Regional ($)
Wastewater Treament Plant																	
WWTP-1	Pipe	WWTP	WWTP		36	New	2,265	$ 1,351,000					$ 1,351,000	100%	$ -	$ -	$ 1,351,000
WWTP-1A	Casing[1]	WWTP	Casing under San Luis Canal		36/48	New	200	$ 557,000					$ 557,000	100%	$ -	$ -	$ 557,000
WWTP-1C	Casing[1]	WWTP	Casing under future H-152 Bypass		36/48	New	365	$ 1,016,000					$ 1,016,000	100%	$ -	$ -	$ 1,016,000
WWTP-1B	Casing[1]	WWTP	Casing under San Luis Master Drain		36/48	New	200	$ 557,000					$ 557,000	100%	$ -	$ -	$ 557,000
WWTP-2	Pipe	WWTP	WWTP		36	New	475	$ 284,000		$ 284,000				100%	$ -	$ -	$ 284,000
WWTP-2A	Casing[1]	WWTP	Casing under Santa Fe Canal		36/48	New	150	$ 418,000		$ 418,000				100%	$ -	$ -	$ 418,000
Downtown Sewer																	
DT-1	Pipe	J Street	East of Linda Vista		8	New	465	$ 67,000	$ 67,000					0%	$ 67,000	$ -	$ -
Pioneer Trunk																	
P-1	Pipe	Future road	New development		21	New	8,114	$ 2,824,000	$ 1,412,000	$ 1,412,000				100%	$ -	$ -	$ 2,824,000
P-1A	Casing[1]	152	Casing under Highway 152		21/42	New	187	$ 456,000	$ 228,000	$ 228,000				100%	$ -	$ -	$ 456,000
P-2	Pipe	Pioneer	East of 165 along Pioneer and curving northward		18	New	7,135	$ 2,128,000		$ 1,316,000	$ 812,000			100%	$ -	$ -	$ 2,128,000
P-3	Pipe	Pioneer	Plow Camp to 165		18	New	2,623	$ 782,000				$ 782,000		100%	$ -	$ -	$ 782,000
P-3A	Casing[1]	Canal	Casing under Main Canal		18/30	New	200	$ 348,000				$ 348,000		100%	$ -	$ -	$ 348,000
P-4	Pipe	Pioneer	Diana to Plow Camp		15	New	1,348	$ 368,000				$ 368,000		100%	$ -	$ 368,000	$ -
P-5	Pipe	Pioneer	West of Diana		15	New	3,755	$ 1,026,000				$ 1,026,000		100%	$ -	$ 1,026,000	$ -
P-6	Pipe	Pioneer	East of Ortigalita		12	New	2,927	$ 640,000					$ 640,000	100%	$ -	$ 640,000	$ -
P-7	Pipe	Pioneer	West of Origalita		10	New	2,142	$ 390,000					$ 390,000	100%	$ -	$ 390,000	$ -
P-8	Pipe	Future road	New development		12	New	719	$ 158,000			$ 158,000			100%	$ -	$ 158,000	$ -
P-9	Pipe	Future road	New development		10	New	810	$ 148,000			$ 148,000			100%	$ -	$ 148,000	$ -
P-10	Pipe	Phillips	Runs partially along Phillips and to the north of Phillips		10	New	2,400	$ 437,000			$ 437,000			100%	$ -	$ 437,000	$ -
P-11	Pipe	165	South of Pioneer		10	New	1,302	$ 237,000			$ 237,000			100%	$ -	$ 237,000	$ -
P-12	Pipe	Plow Camp	South of Pioneer		10	New	1,323	$ 242,000				$ 242,000		100%	$ -	$ 242,000	$ -
P-13	Pipe	Center	South of Pioneer		10	New	1,384	$ 253,000				$ 253,000		100%	$ -	$ 253,000	$ -
P-14	Pipe	Future road	New development		10	New	1,450	$ 264,000				$ 264,000		100%	$ -	$ 264,000	$ -
P-15	Pipe	Ortigalita	South of Pioneer		10	New	1,330	$ 242,000					$ 242,000	100%	$ -	$ 242,000	$ -
North Trunk																	
N-1	Pipe	152 bypass	Southeast of lift station		24	New	980	$ 390,000		$ 390,000				100%	$ -	$ -	$ 390,000
N-2	Intentionally left blank																
N-3	Pipe	152 bypass	Northwest of lift station, to Nantes		36	New	10,332	$ 6,162,000		$ 6,162,000				100%	$ -	$ -	$ 6,162,000
N-4	Pipe	152 bypass	West of Nantes		36	New	5,501	$ 3,281,000			$ 3,281,000			100%	$ -	$ -	$ 3,281,000
N-5	Pipe	152 bypass	South of 152 bypass		30	New	5,742	$ 2,853,000			$ 2,853,000			100%	$ -	$ -	$ 2,853,000
N-6	Pipe	Ingomar	South of 152 bypass		24	New	4,527	$ 1,800,000				$ 1,800,000		100%	$ -	$ -	$ 1,800,000
N-6A	Casing[1]	Canal	Casing under Main Canal		24/42	New	200	$ 487,000				$ 487,000		100%	$ -	$ -	$ 487,000
N-6B	Casing[1]	River	Casing under Los Banos Creek		24/42	New	200	$ 487,000				$ 487,000		100%	$ -	$ -	$ 487,000
N-7	Pipe	Quail	East of Westminister		10	New	681	$ 125,000		$ 125,000				100%	$ -	$ 125,000	$ -
N-8	Pipe	Mercy Springs	South of 152 bypass		12	New	627	$ 137,000		$ 137,000				100%	$ -	$ 137,000	$ -
N-9	Pipe	Future road	New development		12	New	2,314	$ 505,000		$ 505,000				100%	$ -	$ 505,000	$ -
N-10	Pipe	Nantes	South of 152 bypass		12	New	2,119	$ 463,000		$ 463,000				100%	$ -	$ 463,000	$ -
N-11	Pipe	Johnson	South of 152 bypass		12	New	1,786	$ 390,000			$ 390,000			100%	$ -	$ 390,000	$ -
N-12	Pipe	Future road	New development		10	New	2,513	$ 459,000				$ 459,000		100%	$ -	$ 459,000	$ -
N-13	Pipe	Future road	New development		21	New	3,910	$ 1,360,000				$ 1,360,000		100%	$ -	$ -	$ 1,360,000
N-14	Forcemain	Future road	Force main across future 152 bypass		12	New	700	$ 153,000					$ 153,000	100%	$ -	$ -	$ 153,000

Table ES.3 Capital Improvement Projects

Wastewater Collection System Master Plan

City of Los Banos

Figure No.	Type of Improvement	Description/ Street	Description / Limits	Project Length/Size and Cost: Ex. Size/ Diam. (in)	New Size/ Diam. (in)	Replace/ New	Length (ft)	Capital Improvement Cost[2],[3] ($)	Capital Improvement Phasing: Phase 1 2010-15 ($)	Phase 2 2016-20 ($)	Phase 3 2021-2025 ($)	Phase 4 2026-2030 ($)	Phase 5 2031+ ($)	Future Users Benefit (%)	Improvement Reimbursement Category: Existing Improvements ($)	Future Improvements: Developer ($)	Future Improvements: Regional ($)
N-14A	Casing[1]	Future road	Casing under future 152 bypass		12/24	New	700	$ 973,000					$ 973,000	100%	$ -	$ -	$ 973,000
N-15	Pipe	Future road	New development		21	New	2,730	$ 950,000					$ 950,000	100%	$ -	$ -	$ 950,000
N-16	Pipe	Future road	New development		18	New	2,450	$ 730,000					$ 730,000	100%	$ -	$ -	$ 730,000
N-17	Pipe	Future road	New development		15	New	2,130	$ 582,000					$ 582,000	100%	$ -	$ 582,000	$ -
N-18	Pipe	Future road	New development		12	New	1,830	$ 401,000					$ 401,000	100%	$ -	$ 401,000	$ -
N-19	Pipe	Future road	New development		10	New	3,570	$ 651,000					$ 651,000	100%	$ -	$ 651,000	$ -
N-20	Pipe	Future road	New development		10	New	890	$ 162,000					$ 162,000	100%	$ -	$ 162,000	$ -
N-21	Pipe	Future road	New development		10	New	3,030	$ 552,000					$ 552,000	100%	$ -	$ 552,000	$ -
N-22	Pipe	Future road	New development		10	New	2,970	$ 541,000					$ 541,000	100%	$ -	$ 541,000	$ -
N-23	Pipe	Future road	New development		10	New	2,920	$ 532,000					$ 532,000	100%	$ -	$ 532,000	$ -
N-LS	Lift Station	Quail	New development		9.2 mgd	New		$ 4,920,000		$ 4,920,000				100%	$ -	$ -	$ 4,920,000
	Land Acquisition				0.25 acres	New		$ 60,000		$ 60,000				100%	$ -	$ -	$ 60,000
N-LS2	Lift Station	Future road	New development		2.7 mgd	New		$ 1,515,000					$ 1,515,000	100%	$ -	$ -	$ 1,515,000
	Land Acquisition				0.25 acres	New		$ 60,000					$ 60,000	100%	$ -	$ -	$ 60,000
Meadowlands																	
Meadowlands-LS	Lift Station	NE Los Banos	NE Los Banos		2.9 mgd	Upsize		$ 1,604,000			$ 1,604,000			100%	$ -	$ -	$ 1,604,000
M-1	Pipe	Ward Road/Future Road	Within Industrial Area Plan		12	New	2,341	$ 512,000	$ 512,000					100%	$ -	$ 512,000	$ -
M-2	Pipe	Future Road	Within Industrial Area Plan		10	New	852	$ 156,000	$ 156,000					100%	$ -	$ 156,000	$ -
M-3	Pipe	Industrial Parkway/Future Road	Within Industrial Area Plan		12	New	2,932	$ 641,000	$ 641,000					100%	$ -	$ 641,000	$ -
Vineyard Trunk																	
V-1	Pipe	Nantes	South of Burgundy		15	New	810	$ 222,000		$ 222,000				100%	$ -	$ 222,000	$ -
V-2	Pipe	Future road	New development		12	New	1,871	$ 409,000		$ 409,000				100%	$ -	$ 409,000	$ -
V-3	Pipe	Future road	New development		10	New	829	$ 151,000		$ 151,000				100%	$ -	$ 151,000	$ -
V-4	Pipe	Johnson	South of Capri		10	New	1,467	$ 267,000		$ 267,000				100%	$ -	$ 267,000	$ -
Provinces Trunk																	
PR-1	Pipe	Overland	New development		12	New	2,200	$ 480,000	$ 480,000					100%	$ -	$ 480,000	$ -
PR-2	Pipe	Palermo	New development		12	New	500	$ 109,000	$ 109,000					100%	$ -	$ 109,000	$ -
Southeast Trunk																	
SE-1	Pipe	Pine	New development		10	New	2,973	$ 541,000		$ 541,000				100%	$ -	$ 541,000	$ -
SE-2	Pipe	Future road	New development		10	New	1,538	$ 281,000		$ 281,000				100%	$ -	$ 281,000	$ -
Badger Flat Trunk																	
BF-1	Pipe	Badger Flat	New development		12	New	2,169	$ 474,000	$ 474,000					100%	$ -	$ 474,000	$ -
BF-2	Pipe	Badger Flat	New development		10	New	2,131	$ 388,000	$ 388,000					100%	$ -	$ 388,000	$ -
College Trunk																	
C-1	Pipe	Future road	New development		10	New	1,974	$ 360,000			$ 360,000			100%	$ -	$ 360,000	$ -
Stone Creek Trunk																	
SC-1	Pipe	Future road	New development		10	New	1,426	$ 261,000	$ 261,000					100%	$ -	$ 261,000	$ -
West Trunk																	
W-1	Pipe	Future road	New development		18	New	2,784	$ 830,000			$ 830,000			100%	$ -	$ -	$ 830,000
W-1A	Casing[1]	Future road	Casing under Los Banos Creek		18/30	New	81	$ 140,000			$ 140,000			100%	$ -	$ -	$ 140,000

Table ES.3 Capital Improvement Projects

Wastewater Collection System Master Plan

City of Los Banos

Figure No.	Type of Improvement	Description/ Street	Description / Limits	Project Length/Size and Cost: Ex. Size/ Diam. (in)	New Size/ Diam. (in)	Replace/ New	Length (ft)	Capital Improvement Cost[2],[3] ($)	Capital Improvement Phasing: Phase 1 2010-15 ($)	Phase 2 2016-20 ($)	Phase 3 2021-2025 ($)	Phase 4 2026-2030 ($)	Phase 5 2031+ ($)	Future Users Benefit (%)	Improvement Reimbursement Category: Existing Improvements ($)	Future Improvements: Developer ($)	Future Improvements: Regional ($)
W-2	Pipe	Future road	New development		15	New	4,326	$ 1,182,000				$ 1,182,000		100%	$ -	$ 1,182,000	$ -
W-3	Forcemain	Future road	New development		10	New	98	$ 17,000					$ 17,000	100%	$ -	$ 17,000	$ -
W-4	Pipe	Future road	New development		12	New	1,905	$ 417,000					$ 417,000	100%	$ -	$ 417,000	$ -
W-5	Pipe	Future road	New development		12	New	1,941	$ 424,000					$ 424,000	100%	$ -	$ 424,000	$ -
W-6	Pipe	Future road	New development		12	New	2,951	$ 646,000				$ 646,000		100%	$ -	$ 646,000	$ -
W-7	Pipe	Future road	New development		10	New	1,037	$ 189,000				$ 189,000		100%	$ -	$ 189,000	$ -
W-8	Pipe	Future road	New development		10	New	880	$ 161,000				$ 161,000		100%	$ -	$ 161,000	$ -
W-9	Pipe	Future road	New development		10	New	848	$ 154,000				$ 154,000		100%	$ -	$ 154,000	$ -
W-10	Pipe	Future road	New development		10	New	868	$ 158,000				$ 158,000		100%	$ -	$ 158,000	$ -
W-11	Pipe	Future road	New development		10	New	953	$ 173,000				$ 173,000		100%	$ -	$ 173,000	$ -
W-12	Pipe	Breunig	New development		12	New	2,935	$ 641,000					$ 641,000	100%	$ -	$ 641,000	$ -
W-13	Pipe	Breunig	New development		10	New	1,054	$ 192,000					$ 192,000	100%	$ -	$ 192,000	$ -
W-14	Pipe	Future road	New development		10	New	2,257	$ 412,000					$ 412,000	100%	$ -	$ 412,000	$ -
W-15	Pipe	Future road	New development		10	New	2,224	$ 406,000					$ 406,000	100%	$ -	$ 406,000	$ -
W-16	Pipe	Future road	New development		12	New	2,943	$ 644,000					$ 644,000	100%	$ -	$ 644,000	$ -
W-17	Pipe	Future road	New development		10	New	1,290	$ 236,000					$ 236,000	100%	$ -	$ 236,000	$ -
W-18	Pipe	Future road	New development		10	New	1,087	$ 198,000					$ 198,000	100%	$ -	$ 198,000	$ -
W-19	Pipe	Future road	New development		10	New	1,037	$ 189,000					$ 189,000	100%	$ -	$ 189,000	$ -
W-20	Pipe	Volta	New development		10	New	3,106	$ 566,000					$ 566,000	100%	$ -	$ 566,000	$ -
W-21	Pipe	Future road	New development		10	New	1,321	$ 240,000					$ 240,000	100%	$ -	$ 240,000	$ -
W-LS	Lift Station	West of Breunig	New development		1.0 mgd	New		$ 808,000					$ 808,000	100%	$ -	$ 808,000	$ -
	Land Acquisition				0.25 acres	New		$ 60,000					$ 60,000	100%	$ -	$ 60,000	$ -
Existing System Rehabilitation and Replacement																	
	Pipe	Various Locations	Sewer main rehabilitation program			Rehab		$ 700,000		$ 200,000	$ 200,000	$ 200,000	$ 100,000	0%	$ 700,000	$ -	$ -
	Lift Station	Various Locations	Lift station rehabilitation or replacement			Replace/Rehab		$ 2,840,000		$ 710,000	$ 710,000	$ 710,000	$ 710,000	0%	$ 2,840,000	$ -	$ -
	Pipe	Various Locations	Sewer main replacement program. Average size is 10-inch diameter	10	10	Replace	25,000	$ 4,557,000		$ 1,139,000	$ 1,139,000	$ 1,139,000	$ 1,139,000	0%	$ 4,556,000	$ -	$ -
	Manhole	Various Locations	Manhole replacement program			Replace		$ 600,000		$ 200,000	$ 200,000	$ 100,000	$ 100,000	0%	$ 600,000	$ -	$ -
Storm Drain Cross Connection Removal																	
A1-1	Pipe	K Street, California Avenue	California Avenue to Iowa Avenue, and s/o L Street to K Street	-	18	New	2,300	$ 617,000		$ 617,000				0%	$ 617,000	$ -	$ -
A1-2	Pipe	Idaho Ave, I St, Texas Ave	L St to I St, west to Texas Ave, then northeast to H St	15	36	New/Replace	4,050	$ 2,174,000	$ 2,174,000					0%	$ 2,174,000	$ -	$ -
A1-3	Pipe	L Street	Delaware Avenue to Idaho Avenue	-	18	New	300	$ 81,000	$ 81,000					0%	$ 81,000	$ -	$ -
CC-6	Pipe	6th Street, K Street	sw/o M Street to K Street, then 6th Street to 7th Street	-	18	New	1,150	$ 309,000			$ 309,000			0%	$ 309,000	$ -	$ -
CC-7	Pipe	Center Avenue, Jefferson Avenue	Madison Avenue to Jefferson Avenue, then to 6th Street	-	18	New	1,850	$ 497,000				$ 497,000		0%	$ 497,000	$ -	$ -
CC-8	Pipe	Pacheco Blvd, Paradise Lane	I Street to Paradise Lane, then south to Adams Avenue	-	12	New	2,300	$ 453,000					$ 453,000	0%	$ 453,000	$ -	$ -
CC-9	Pipe	Murietta Street	Page Street to Monro Street, then east to 7th Street	-	18	New	600	$ 161,000					$ 161,000	0%	$ 161,000	$ -	$ -
							CIP Total	**$ 75,802,000**	**$ 6,983,000**	**$ 21,157,000**	**$ 13,808,000**	**$ 13,185,000**	**$ 20,668,000**		**$ 13,055,000**	**$ 23,270,000**	**$ 39,476,000**

Notes:

1. Proposed casings size and carrier pipe size.
2. Baseline Construction Cost plus 20% to account for unforeseen events and unknown conditions.
3. Estimated Construction Cost plus 30% to cover other costs including Engineering, Construction Management, and Program Implementation.
5. Land acquisition costs were included for lift stations, but not for pipelines, which will be located within public right of way.
6. Costs are based on the Engingeering News Record Construction Cost Index 20-city average of 8592.

Table ES.4 Capital Cost Summary
Wastewater Collection System Master Plan
City of Los Banos

Reimbursement Category	Implementation Phase					Total
	2010-2015 ($, millions)	2016-2020 ($, millions)	2021-2025 ($, millions)	2026-2030 ($, millions)	2031 + ($, millions)	
Existing Improvement[2]	2.32	2.87	2.56	2.65	2.66	**13.06**
Future Developer Improvement[3]	3.02	3.10	1.73	5.28	10.14	**23.27**
Future Regional Improvement[4]	1.64	15.19	9.52	5.26	7.86	**39.48**
Total	**6.98**	**21.16**	**13.81**	**13.19**	**20.67**	**75.80**

Notes:
1. All costs are in November 2009 dollars. ENR CCI 20 City average = 8592
2. Projects are funded through user rates.
3. Projects are developer funded and/or may be part of a development reimbursement agreement.
4. Projects funded through wastewater development impact fees collected by the City.