DRAFT REPORT

WASTEWATER, SEWER COLLECTION, AND STORM DRAIN UTILITIES

TEN YEAR FINANCIAL PLAN

FISCAL YEAR 2015-2016 THROUGH
FISCAL YEAR 2024-2025

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1. Executive summary

The Ten Year Financial Plan provides the City with an understanding of its financial resources and obligations for the next decade, identifying probable surpluses and shortfalls so that management can plan for them. The Ten Year Financial Plan can be used to determine how it will meet the challenges of implementing its vision and meeting its goals and commitments. Shortfalls identified indicate the City cannot sufficiently fund its utilities and must increase funding through rate increases, obtaining external funding or by decreasing services.

This Ten Year Financial Plan includes analyses of the Domestic Wastewater Treatment Plant (DWWTP), the Industrial Wastewater Treatment Plant (IWWTP) (together the Wastewater Treatment Facility [WWTF]), the Domestic Sewer Collection System, the Industrial Sewer Collection System, and the Storm Drain Collection System, referred to in this report as functions. There are two user groups: domestic, composed of residential, commercial, small industrial, and schools; and industrial, composed of 11 significant industrial companies.

a. Accounting

The City accounts for the wastewater, sewer collection and storm drain systems or utilities in the Sewer/Wastewater Fund (015). Prior to fiscal year 2014-2015, the City's accounting structure was composed of two divisions, wastewater and sewer, in the Sewer/Wastewater Fund. In fiscal year 2014-2015, the City broke out the two treatment plants, pre-treatment, and energy into separate divisions to improve cost accounting. It is recommended the City also break out the two sewer collection systems and the storm drain system into separate divisions. This will continue to improve cost accounting.

WWTF revenues and expenditures prior to fiscal year 2014-2015 were developed by allocating the appropriate funding and cost to each plant. The financial plan was developed after one year (fiscal year 2014-2015) of actual experience in an effort to improve the accuracy of the allocations and future projections.

Allocations of revenues and expenses for the two sewer collection systems and the Storm Drain system are made due to the functions combined into one division and the need to break out funding and costs. This is necessary to understand the impact on sewer rates.

Fiscal year 2015-2016 budget is the base for allocations of future projections, fiscal years 2016-2017 through 2024-2025.

b. Revenues

Three funding sources represent 96 percent of the $28 million annual funding for all five functions over the 10 years: the sewer receipts or sewer service charges (91percent), the Federal Internal Revenue Services' (IRS') Build America Bonds (BAB) refunds (3 percent), and the Southern California Edison solar panel project rebate (2 percent). These revenues were allocated to each of the functions and to the user groups, industrial and domestic, for the wastewater treatment plants (WWTPs) and the sewer collection systems. The storm drain collection system is funded by the General Fund for

flood control activities and the Sewer/Wastewater Fund for operations and maintenance (O&M) expenses.

The City maintains historical data for sewer receipts by classification making the allocation easy and accurate between domestic and industrial.

c. Expenses

Costs are defined in this report as expenditures for operations, capital, and debt financing. Operating expenditures are composed of salaries and benefits plus materials, supplies and contract services, excluding depreciation, cost of issuance amortization and interest expense. The current accounting structure combines the Domestic Sewer Collection System, the Industrial Sewer Collection System, and the Storm Drain Collection System. Expenditures were allocated to each of these functions to identify the cost needed to ensure proper management and compliance.

Seven accounts represent 91 percent of operating expenses, which average a little more than $7.5 million per year, or an average of 33 percent of the total annual expenses.

The operating expenditures displayed in all spreadsheets represent the current level of operations and maintenance. The Benchmark Studies identify that this level does not meet compliance and efficient operations on a consistent basis. The systems will continue to degrade and compliance will become more difficult to meet at this level. From a liability perspective, this level of operations funding will likely expose the City to increased fines by the State and to increased risk of lawsuit from an environmental nongovernmental organization (NGO) over violations of the federal Clean Water Act.

A detailed review of operating practices and the infrastructure of the treatment plants, the sewer collection systems and the storm drain system was performed by Ewers Engineering through Benchmark Studies. Modifications to the existing list of capital projects was done to ensure a comprehensive Capital Improvement Program (CIP) meeting regulatory compliance and supporting best management practices for the three systems.

d. Capital projects

For several years, the City has minimized costs for all five functions by reducing capital investment. The current policy is to budget $500,000 per year for the IWWTP and the DWWTP and $500,000 for the sewer collection systems, most or all going to the domestic collection system. This represents an average of 4 percent of the total annual expenses. There have been no capital expenditures for the Storm Drain system for some time. This had the effect of focusing City management's attention on operations and maintenance costs. This strategy provides a short-term gain that must be made up with a large increase in capital expenditure to reverse the ongoing system degradation. When those catch-up investments begin, they will significantly exceed annual (non-capitalized) O&M costs.

An updated CIP was developed for the IWWTP and DWWTP, for the domestic and industrial sewer collection systems, and for the storm drain collection system. These CIPs are significant, with more than 400 projects in the storm drain collection CIP alone. A risk-based model was developed to prioritize the projects in each CIP and to provide as much realism as possible for this analysis. Three scenarios were developed to provide a financial analysis of funding by function and user group.

e. Debt service

The average annual debt service payment for the 10 years is a little over $14 million, for an average of 63 percent of the total annual expenses, and a total outstanding debt of just under $192 million.

Appendix A and Appendix B are important to understand the revenues, expenditures and funding required for each function and user group for each scenario and are the focus of this report.

Appendix A, a summary spreadsheet, was developed allocating revenues and expenditures to the DWWTP, the IWWTP, the Domestic Sewer Collection System, the Industrial Sewer Collection Treatment System, and the Storm Drain System. Appendix B, a summary spreadsheet, was developed for the Domestic and Industrial user groups. The spreadsheet allocates revenues and expenditures to the DWWTP and the Domestic Sewer Collection System as well as for the IWWTP and the Industrial Sewer Collection Treatment System.

f. CIP funding scenarios

Three scenarios, found in Appendix C, modeled CIP expenditures to determine the financial and rate impact. One scenario was developed to address the current level of funding and operations. Two scenarios were developed to address the necessary costs and funding to meet regulatory compliance and improve operational efficiencies now and in the future.

Scenario 1 (current):

Scenario 1 reflects the current level of funding for capital expenditures at $1,000,000 annually. The wastewater $500,000 capital expenditure is split into $100,000 for the DWWTP, $400,000 for the IWWTP, $500,000 for the Domestic sewer collection system and nothing for the Industrial sewer collection or storm drain systems.

The sewer collection $500,000 capital expenditure is devoted to the domestic system because so little is known about the need for improvements in the relatively new industrial system.

Revenues for the fund average approximately $28,000,000, and total expenses average approximately $22,700,000 annually over the 10 years. Prior to fiscal year 2014-2015, capital project expenditure averaged $8,700,000 for the previous three fiscal years. CIP expenses were reduced to the current level by the City's Board of Public Utilities. This scenario yields an average of $6 million net surplus annually, which could allow the City to increase capital project expenditures or to pay down outstanding debt. But three major functions, wastewater treatment, sewer lines and storm drains, are significantly underfunded and continue to deteriorate in this funding scenario, threatening the City's ability to meet regulatory requirements and operational standards.

The Domestic treatment plant and sewer collection system operational and maintenance costs ($3,300,000 average annual for 10 years) are well funded at the current level with an average annual surplus of approximately $5,000,000.

The Industrial treatment plant and sewer collection system operational and maintenance costs ($3,900,000 average annual for 10 years) are only funded at the current level of operation and maintenance and basically break even after 10 years. Remember, the current level is not funding future infrastructure needs for the treatment plants or the collection systems.

The Storm Drain system continues to be significantly underfunded, with average annual expenditures of $218,000 over 10 years, threatening compliance and operational efficiency. Likely, flooding at various locations in the City will continue intermittently.

Two additional scenarios were developed to address funding deficiencies.

Scenario 2 (20-year risk reduction):

This scenario reflects the minimum needed capital expenditures to meet regulatory requirements and operational improvements over a 20-year period. The City is at risk for the first five plus years until enough key capital projects are completed to ensure regulatory compliance.

Additional operational costs would occur on an annual basis to improve the efficiency and condition of the infrastructure. These costs are NOT reflected in the Ten Year Financial Plan because the City has not determined the type of activities or the level of increased maintenance to implement. Examples of increased costs would be for plant cleaning and monitoring, safety, painting, sewer line television work, root control through foaming, smoke and/or dye testing for leaks, line repair, line renewal, pump station cleaning and monitoring, pump and motor replacement to name a few.

Revenues for the fund average approximately $28,000,000 and total expenses average approximately $31,500,000 annually. Capital projects are the variable expense for Scenarios 2 and 3. The average annual debt service payment is $14,000,000.

Under this Scenario, the fund begins deficit spending after the current fiscal year 2015-2016. The greatest impact is due to the significant increase in capital expenditures starting in fiscal year 2016-2017 for the Storm Drain collection system. This is required because of the system degradation that has already occurred. The second impact to deficit spending is due to increased Industrial capital expenditures.

The Domestic functions for the treatment plant and sewer collection system are adequately funded with an average revenue of approximately $12,600,000 and average expenditure of approximately $10,400,000 annually. However, there are eight large capital projects, totaling nearly $730 million over the next 60 years that are not reflected in the Ten Year Financial Plan due to their lack of specificity, costing and scheduling. A detail discussion of these projects is provided in the Capital Projects, Type 3, section of this report.

The Industrial functions for the treatment plant and sewer collection system are underfunded, with an average annual deficit of $400,000. After fiscal year 2019-2020, the Industrial funding for wastewater treatment and collection is approximately $1 million in deficit

annually. As previously discussed, there are increased operational costs that should occur but are not identified and therefore not accounted for in the projected deficit.

This Scenario reflects a 20-year CIP to reduce the risk of noncompliance and improve operational efficiency.

Scenario 3 (20-year program accelerated):

Scenario 3 reflects the needed capital projects expenditures to meet regulatory requirements and operational improvements over a 20-year period, accelerated for the first four fiscal years. This scenario reduces the City's risk by implementing more compliance and health and safety-related capital projects in the first four years. It also reduces the total capital costs over 20 years. This scenario is recommended, due to risk and cost reduction over the 20-year CIP assessment period, as compared to the other two scenarios.

However, Scenario 3, like Scenario 2, requires rate increases to fund the needed capital projects and increased operational costs not yet accounted for.

Revenues for the fund average approximately $28,000,000, and total expenses average approximately $31,700,000 annually. Capital projects are the variable expense for Scenarios 2 and 3. The average annual debt service payment is $14,000,000.

Under this Scenario, the fund begins deficit spending after the current fiscal year 2015-2016. The greatest impact is due to the significant increase in capital expenditures starting in fiscal year 2016-2017 for the Storm Drain system. This is required because of the system degradation that has already occurred. The second impact to deficit spending is due to increased Industrial capital expenditures. As previously discussed, there are increased operational costs that should occur but are not identified and therefore not accounted for in the projected deficit.

The Domestic functions for the treatment plant and sewer collection system are adequately funded with an average surplus of $2.1 million annually. However, as previously discussed, there are eight large capital projects, totaling nearly $730 million over the next 60 years, that are not reflected in the Ten Year Financial Plan due to their lack of specificity, costing and scheduling. A detailed discussion of these projects is provided in the Capital Projects, Type 3, section of this report.

The Industrial functions for the treatment plant and sewer collection system would have an average annual deficit of $500,000 that would grow to $1.2 million per year after fiscal year 2019-2020. As previously discussed, increased operational costs are anticipated but are not identified, and therefore are not accounted for in the projected deficit.

This Scenario reflects a 20-year accelerated CIP to reduce the risk of noncompliance and improve operational efficiency.

In addition to the proposed capital project expenditures, the Industrial users should begin prefunding for the replacement or major renewal of the industrial sewer line to avoid costly debt financing. Assessment of the pipeline is needed to determine the current condition,

future life and the replacement cost. It is recommended that City staff work with the Industrial user representatives to address the current and future infrastructure condition and growth needs of the systems.

Note: There are eight large capital projects, totaling $195 million constructed today and considerably more over the next 60 years, that are not reflected in the Ten Year Financial Plan because they require City direction to establish whether they will be undertaken as large, debt-financed projects, as pay-as-you-go-financed projects, or with a mixture of the two funding approaches. When the City has come to an agreement about how to finance those projects, the pay-as-you-go portion will increase the annual expenses.

g. Storm drain system

Revenues and expenditures were developed for the Storm Drain system and are displayed in Appendix A. This system has been supported by the Sewer/Wastewater Fund for operations and maintenance and recently by the General Fund for basin maintenance and repair. The system requires substantial CIP expenditure to rehabilitate the infrastructure and improve operational efficiency and safety.

Operations and maintenance costs average approximately $218,000 annually over the 10 years of analysis. Flood basin maintenance has recently been contracted with and performed by the Tulare Irrigation District (TID) and averages $100,000 annually. This maintenance is performed every three to five years. The flood basin maintenance costs are funded by the General Fund.

Storm drain capital projects have been nonexistent for several years. This has allowed the infrastructure to substantially deteriorate. The pump stations need electrical upgrades, pump and motor repair or replacement, and infrastructure cleaning and repair. The system needs approximately $5 million annually over the next 20 years to bring it up to the level needed to operate efficiently, protect the infrastructure, and minimize flooding. Additional funding is obviously needed and will likely take several years to acquire.

The State of California has been focusing more time and effort to address ground water use and replenishment. The Storm Drain collection system can be a significant asset to the City and community in addressing State requirements and ensuring sufficient water to residents, businesses, farmers and industrial users, and needs to be supported to develop that benefit.

h. Conclusions

Additional operational costs would occur on an annual basis to improve the efficiency and condition of the infrastructure. These costs are not reflected in the Ten Year Financial Plan because the City has not determined the type of activities or the level of increased maintenance to implement. Examples of increased costs would be for plant cleaning and monitoring, safety, painting, sewer line video inspection, chemical root control, smoke and/or dye testing for infiltration/inflow, line repair, line renewal, pump station cleaning and monitoring, and pump and motor replacement, to name a few.

The City must ensure adequate sewer rates to fund the CIP and avoid additional debt financing. Current debt financing instruments show that for every $1,000,000 spent on capital projects,

$1,900,000 would be paid in principal and interest using debt financing. Therefore, $10,000,000 of capital projects would cost approximately $19,000,000 over 20 years. The current average annual debt principal and interest payment is $14,000,000.

In addition to the proposed capital project expenditures, the Industrial users should begin prefunding for the replacement or major renewal of the industrial sewer line to avoid costly debt financing. Pipeline assessment is needed to determine the current condition, future life, and replacement cost. It is recommended that City staff work with the Industrial user representatives to address the current and future infrastructure condition and growth needs of the systems.

2. Introduction

The City of Tulare contracted with Ewers Engineering to develop a Ten Year Financial Plan for the wastewater, sewer collection and storm drain systems or utilities.

a. Purpose

The purpose of the Ten Year Financial Plan is to provide a financial perspective to the Strategic Business Plan and to provide the City Council, Board of Public Utilities and City Management the ability to understand the financial resources necessary to accomplish the plan.

The financial plan allocates actual costs and resources to manage the two treatment facilities, the two sewer collection systems, and the storm drain system into projections to provide a credible projection of the costs in the next 10 years and resources available to accommodate them.

b. Process

The City has accounted for revenue and expenses in the Sewer/Wastewater Fund and two divisions, Wastewater and Sewer. The City separated the two treatment plants into two divisions, Domestic and Industrial, in fiscal year 2014-2015 to improve cost accounting.

Allocations of revenue and expenses for each utility and user group were required. Three past fiscal years (2011-2012, 2012-2013, and 2013-2014) were developed for trending. Fiscal year 2014-2015 was developed as the base year from which to make projections as the latest fiscal year the City tracked actual costs for a full year for each of the utilities and user groups. City staff assisted with the allocation of revenues and expenses to ensure reasonable accuracy.

Future costs were projected based on fiscal year operations and maintenance (O&M) costs, assumed rate increases for inflation, and projects in the CIP. The City's CIP was updated and modified by Ewers Engineering with concurrence by City staff to ensure completeness and accuracy.

Three scenarios were modeled at three different annual CIP funding levels to determine the financial and rate impacts. One scenario was developed to address the current level of funding and operations, and two more scenarios were developed to address the necessary costs and funding to meet regulatory compliance and improved operational efficiencies now and in the future.

The three utilities comprise the City's Sewer/Wastewater Fund (015). Wastewater and Sewer (which includes Storm Drain), are separate divisions. Wastewater is composed of two divisions, the

DWWTP and IWWTP. Sewer collection includes the domestic and industrial sewer collection facilities.

The WWTPs have an Operations Manager that reports to the Public Works Director, who reports to the City Manager. The Sewer/Storm Drain System Technicians report to the Lead Sewer/Storm Drain System Technician, who reports to the Water and Wastewater Collections Utility Manager, who reports to the Public Works Director.

3. Economic environment

It's important to understand the economic environment of the past few years and what is likely to happen to the economy in the 10 years of the projections to provide context to the assumptions that have been made in the model. The economic environment also helps explain past decisions by the City. Many factors are affected by the economic climate, principle among them are the inflation rate, the rate of return on the City's liquid funds, and the cost of labor, materials and supplies, contract services, and capital.

Two economic forecasts for California provide an understanding of possible impacts to the City and their utilities, the UCLA-Anderson forecast and the California Department of Finance forecast. A summary of their combined perspectives is provided below.

a. Local

The City should continue to see slow growth, approximately two to three percent per year, through the next few years as the State recovers from the Great Recession. The City lags the State in its recovery. Unemployment continues to challenge the City and community. The strongest recovery is occurring in the Los Angeles, San Diego, and the San Francisco Bay areas.

The following information that informs these local observations is from the California Department of Transportation's latest projections, for the period from 2011-2016:

- Between 2011 and 2016, total employment growth averages 1.5 percent per year and non-farm job growth averages 2.3 percent per year.
- Average salaries adjusted for inflation are currently below the California state average, and will remain so over the forecast period. Inflation-adjusted salaries are expected to rise an average of 0.9 percent per year between 2011 and 2016.
- Between 2011 and 2016, the momentum for employment growth occurs in professional services, wholesale and retail trade, construction, and government. These sectors account for 58 percent of growth during this time period. Farm employment rises modestly and contributes 11 percent of total employment growth.
- The population in the county will continue to grow faster than the state average. Annual growth in the 2011 to 2016 period averages 1.9 percent per year.
- Net migration will remain at approximately the 2010 level, with around 2,700 people having entered the county in 2011. From 2011 to 2016, net migration is expected to average 2,900 net migrants entering the county per year.

- Real per capita income was forecasted to rise 0.1 percent in 2011. Between 2011 and 2016, the growth of real per capita income is expected to average 1.1 percent per year.
- Total taxable sales, adjusted for inflation, are expected to increase by an average of 6.0 percent per year from 2011 to 2016, and were not expected to return to the 2006 peak level until 2014.
- Industrial production is forecast to rise 2.7 percent in 2011. During the 2011 to 2016 period the growth rate of industrial production also averages 2.7 percent per year.
- Farm production is forecast to increase by 2.9 percent per year between 2011 and 2016. The principal crop in the county is dairy products.

The City has a significant reliance on the dairy and dairy by-product industry. The dairy industry will be challenged with forecasted milk price decreases and the continued drought conditions. Many dairy farms are or are considering moving to almond orchards. Water supply continues to decrease, increasing its value, creating an opportunity for the WWTF to produce and market Title 22-compliant recycled water (suitable for irrigating edible crops) and substantially increasing revenues.

b. California

California's economy continues to power forward, with many of the Golden State's largest and most important industries gaining momentum. High-tech continues to show steady gains. San Francisco, San Jose, and San Diego are all benefitting from the strong growth in this major industry group. Health services are also expanding rapidly and appear to have adjusted to the rollout of the Affordable Care Act with only minimal disruption. Construction has picked up to keep pace with the rapidly expanding economy and demand for apartments, warehouse, and office space is rising solidly. Home sales remain sluggish, but the trend seems to be somewhat more positive than what we have seen nationwide. Home price appreciation continues to run ahead of the national average, reflecting both stronger economic gains and a scarcity of developable land.

The estimate for the 2015 total employment growth is 2.6 percent, and for 2016 and 2017, the forecast is for 2.1 percent and 1.4 percent. Payrolls will grow at corresponding rates. Real personal income growth is estimated to be 4.3 percent in 2015 and forecast to be 3.4 percent in 2016 and 3.2 percent in 2017. Unemployment rate should decrease from the current 5.0 percent to 4.9 percent in 2016, and could improve to 4.6 percent through the balance of 2017, slightly better than the nation.

Although California's economy is expected to continue to grow, the state is not without its challenges. Growth has moderated recently, and the huge surge in tech-related hiring and associated construction projects is unlikely to be sustained long-term. Retailers and financial services firms are still posting only modest gains. Lower oil prices are weighing on the energy producers in Kern County, and a lack of water remains a challenge for farmers and residents alike. In addition, the state's high costs of living combined with sluggish wage and salary growth for middle-income households has exacerbated the out-migration of residents. Few of these problems are truly new, and California seems to continuously prove that none of them are insurmountable.

The weak growth rates of 2009-2014 that hovered around 2 percent are in the past as the economy ramps up to a sustained period of 3 percent growth in real GDP. A 2.8 percent growth in the current quarter and an anticipated growth to average 3.1 percent in both 2015 and 2016 is forecasted.

However, the forecasts do not account for the impact of full implementation of the Affordable Care Act, the loss of federal subsidies for increased Medi-Cal enrollment and the recent increase in illegal immigrants to the state. Increased costs from these elements will likely require a modification to the forecasts in the future.

c. National

Reenergized consumer spending as well as an uptick in home building is projected to boost the nation's GDP in the second quarter and beyond, on the heels of first-quarter GDP that is expected to clock in as low as 2 percent. Ongoing job growth and expected wage increases will drive consumption in 2016 leading to the first year of greater than 3 percent growth in real GDP since 2005.

Unemployment rate should decrease from the current 5.0 percent to 4.9 percent in 2016 and 4.6 percent through the balance of 2017. This is based upon the current economy generating jobs at a 200,000-a-month pace.

Consumers are energized by the availability of more jobs and lower energy prices. With more money into their pockets, they're paying for other goods and services. Spending by consumers in the fourth quarter of 2014 grew at the fastest rate in more than eight years. Moreover, with unemployment on the wane — further boosting perceptions of economic security — consumer confidence this year is at its highest level since 2007.

With consumer spending on the rise, more businesses will increase investment in new production capacity. Housing is in a recovery mode, with builders expected to increase the pace of new multi-family home starts in 2016 and 2017.

Higher wages, along with a modest rebound in oil prices and higher housing costs, will push the inflation rate above two percent, leading the Federal Reserve Board to begin a gradual tightening cycle. Economic strength will be found in housing and commercial construction along with a booming automobile market. The collapse in oil-related capital spending will come to an end next year and defense spending will be increased after five years of decline.

The economic context is used in the model to generate the following assumptions:

- Capital inflation rate: 3.5 percent and rate of return: 1.25 percent.

Table 1: Projected inflation increases					
Expense	Fiscal Year 2015-2016	Fiscal Year 2016-2017	Fiscal Year 2017-2018	Fiscal Year 2018-2019	Fiscal Year 2019-2020
Salary Inflation	1.0%	1.0%	1.0%	1.0%	1.0%
Benefits Inflation	3.5%	3.5%	3.5%	3.5%	3.5%
General Inflation	3.0%	3.0%	3.0%	3.0%	3.0%
Chemicals	3.5%	3.5%	3.5%	3.5%	3.5%
Utilities	5.0%	5.0%	7.0%	7.0%	7.0%
Contracts	3.0%	3.0%	3.0%	3.0%	3.0%
Construction	4.5%	4.5%	4.5%	4.5%	4.5%

Expense	Fiscal Year 2020-2021	Fiscal Year 2021-2022	Fiscal Year 2022-2023	Fiscal Year 2023-2024	Fiscal Year 2024-2025
Salary Inflation	1.0%	1.0%	1.0%	1.0%	1.0%
Benefits Inflation	3.5%	3.5%	3.5%	3.5%	3.5%
General Inflation	3.0%	3.0%	3.0%	3.0%	3.0%
Chemicals	3.5%	3.5%	3.5%	3.5%	3.5%
Utilities	7.0%	7.0%	7.0%	7.0%	7.0%
Contracts	3.0%	3.0%	3.0%	3.0%	3.0%
Construction	4.5%	4.5%	4.5%	4.5%	4.5%

A significant cost to the three utilities is the electricity needed and used to meet processing needs and compliance. Utility costs are projected to increase seven percent annually after fiscal year 2016-2017. This projection is based upon the following summary review of forecasted rates in California and specifically Southern California Edison (SCE), the City's provider.

Most industry experts predict that average electricity prices throughout the U.S. will increase significantly over the next decade. Californians in particular should expect to see high price increases, averaging 5-7 percent per year, given stronger environmental legislation and historical underinvestment.

The key indicators and drivers for California electricity rates include:

- Historical trends point to steep rate increases over time - In California commercial rates have increased 6-8 percent annually since 2000 and approximately 7.5 percent in 2008. If the current trends continue, prices are projected to increase by similar amounts in the next decade.
- Infrastructure - Over the next 10 years, over $7 billion dollars will need to be injected into the grid to upgrade existing infrastructure and accommodate new capacity and Smart Grid requirements. This will result in 2-2.5 percent annual rate increases over the next 10 years.
- Fuel costs - Fuel costs (e.g., natural gas) are projected to double by 2020, which translates to a 1.5-2 percent annual increase in average retail electricity prices.

- Climate change - The approval of 33 percent Renewable Portfolio Standard in California will likely increase average electricity rates 2-2.5 percent annually until 2020.

Energy prices have risen steadily over the past 20 years, and historical increases are likely to continue, driven by the three structural forces:

- Infrastructure upgrades: 2-2.5 percent annual increase
- Fuel cost increases: 1.5-2 percent annual increase
- Climate change legislation: 2-2.5 percent annual increase

The combination of these factors makes it probable that electricity costs will be a major concern for California businesses over the next decade.

California passed its own climate emissions bill, AB 32, in August 2006. The law calls for a 10 percent reduction of greenhouse gases and places strict regulations on power plant emissions. To comply with these regulations, generators must be outfitted with expensive improvements or their owners pay penalties, which makes power more expensive. Governor Schwarzenegger issued an executive order to revise the current Renewable Portfolio Standard (RPS) and require Californian utilities to source 33 percent of their power from renewable sources by 2020. Like AB 32, this law is expected to cause retail electricity rates to increase significantly. According to a California Public Utilities Commission report published in June 2009, inflation-adjusted electricity rates will increase 5.0 to 6.5 percent above current baseline projections to meet California's clean energy.

The above information can be found in the white paper, "Understanding California's Electricity Prices" by Bloomenergy. Another source, *The Future of Electricity Prices in California: Understanding Market Drivers and Forecasting Prices to 2024,* by Jonathan Cook, PhD, provides more specific information about Tulare's energy provider, Southern California Edison.

Similar to PG&E, Southern California Edison (SCE) is a huge utility that serves approximately 5 million residential, commercial and industrial customers in central and southern California.

Unlike PG&E, SCE provides only electricity to its customers and also has a slightly different portfolio of electric power plants that rely more heavily on nuclear and natural gas generation and less on hydroelectric power. Before 2013, a large chunk of SCE's generation capacity came from two nuclear power plants – the San Onofre plant in South San Clemente and the Palo Verde plant in Phoenix, Arizona.

Together, these two plants made up about 2.3 GW out of SCE's total generating capacity of 5.5 GW (about 42 percent). Due to a radiation leak, however, the San Onofre plant hasn't generated electricity since January 2012 and SCE announced on June 7, 2013 that the plant will be shut down permanently. The shutdown of San Onofre is likely to put upward pressure on short-run electricity prices in SCE territory for several reasons. First, although CAISO has already found enough generating capacity to keep the grid running reliably via reserves and increased imports, permanent solutions will require adding new capacity in southern California (primarily in the form of natural gas) and new transmission lines to access other resources that lie outside of the Los Angeles and San Diego areas (EIA 2013b).

At present, the continued outage of San Onofre is being cited as the primary reason why wholesale power prices in California were 59 percent higher during the first half of 2013 compared to the first half of 2012 (EIA 2013c).

Secondly, as described earlier in the report, shutting down a nuclear plant from the grid removes a low- cost resource from the system and will result in higher wholesale prices if replaced by generation with higher marginal costs. Long-run solutions to the problem will reduce wholesale prices back to more normal levels, but will likely require capital expenditures that will be recouped through rates.

Ultimately, the CPUC will decide how much SCE customers will have to pay for the shutdown of the reactors. Other sources of funding to cover the shutdown include Mitsubishi Heavy Industries Ltd., who manufactured the failed plumbing, and a nuclear power insurer. It also remains to be seen whether SCE will be required to refund some or all of the $529 million it charged customers for replacement power since the plant was shut or the $813 million charged for operating it when it wasn't generating electricity.

Another key question that has yet to be resolved is whether consumers will continue to pay back SCE for the initial $2.1 billion investment that was required to construct the plant now that it is no longer producing electricity.

Finally, there are also significant costs associated with the actual decommissioning of San Onofre and SCE estimates that $300-450 million of those costs will be absorbed by ratepayers via higher rates (Chediak and Polson 2013).

Neither AEO 2013 nor the GHG Calculator takes into account the impacts of the San Onofre shutdown, so quantitative estimates of the rate impacts are presently unavailable.

In addition to San Onofre, SCE also operates a significant amount of natural gas generation (about 1.25 GW) and will therefore be more exposed to carbon prices than PG&E.

SCE's non-generating assets continue to age, and the company anticipates that significant capital expenditures will be required to upgrade a transmission and distribution system that was mostly built immediately after World War II (SCE 2010).

The company argued in its 2012 rate case that many of these assets have reached or exceeded the end of their useful lives and must be replaced to continue providing reliable service (SCE 2010). To date, CPUC has not accepted the full amount of these T&D requests, but large future investments are likely inevitable.

4. Revenue

Revenues were allocated to the functions by Domestic and Industrial users to track funding and costs for each of the functions and users.

Table 2: Function and correlated user types	
Function	**User**
DWWTP	Domestic (residential, commercial, small industrial, schools)
IWWTP	Industrial (11 significant users)
Domestic Sewer Collection System (SSD)	Domestic (residential, commercial, small industrial, schools)
Industrial Sewer Collection System (SSI)	Industrial (11 significant users)
Storm Drain System (SD)	Entire city

The combined average annual revenue for the utilities is approximately $28 million over the 10 year projection period. The largest revenue source is sewer receipts/sewer service charge, which constitutes an average annual amount of approximately $27 million, or 96 percent of all revenue for the fund. The City has tracked the revenue from residential, commercial, business and industrial sewer rates for the past several years, which permits an accurate distribution of revenue to the five functions. A detailed review of the allocation methodology and sewer receipts is provided later in this report.

Because these monies support both treatment plants and the sewer collection system systems, the revenue from sewer receipts/sewer service charge were allocated to domestic and industrial facilities overall. Splitting the revenue between the two user groups provides an understanding of funding and rates. Sewer receipts/sewer service charge revenue details can be found in Appendix F.

Appendix D includes a summary of revenue for the Sewer/Wastewater Fund by account. Revenues are currently accounted for at the fund level, therefore allocations were required to reasonably reflect revenue by major function. Appendix E includes the revenue allocation to each major function by fiscal year.

The Sewer/Wastewater Fund receives approximately $26 million annually over the ten years. No rate modifications are reflected in future years. It is assumed, but not reflected, that rates will likely increase at least due to inflation. The Ten Year Financial Plan does not reflect increases because rates are at the purview of the City's Board of Public Utilities.

Appendix F documents the revenue allocation methodology. This was developed with the Department of Finance's review.

As Table 3 shows, more than 95 percent of total revenues received come from three revenue sources.

Table 3: Largest fund revenue sources		
Account	**Average Annual**	**Percent of Total Revenue**
Sewer Receipts	$25,547,503	90.92%
IRS Build America Bonds (BAB) Interest Reimbursement	$855,356	3.04%
Southern California Edison Rebate (Misc. Revenue)	$470,000	1.67%
Totals	$26,872,859	95.63%

Each of the significant revenue sources is addressed below.

a. Sewer receipts /sewer service charge

The largest revenue source is Sewer Receipts/Sewer Service Charge, annually averaging approximately $25.5 million (91 percent) of all fund revenue over the 10 years projected. The City has tracked the revenue from domestic (residential, schools, and commercial users) and industrial users for the past several years, allowing an accurate distribution of revenue to the five major functions.

The City's sewer customers are billed monthly for sewer service. Sewer rates are based on customer classification. All connections to the City's sewer system must pay a minimum monthly charge for sewer service.

- Residential customers predominantly pay flat monthly rates for sewer service.
- Commercial and small industrial customers are charged based on customer class and amount of metered water use.
- Schools are billed based on number of students.
- Significant industrial customers pay charges based on measured flow and estimated wastewater strength as measured by biochemical oxygen demand (BOD) and total suspended solids (TSS). The City also charges penalties for exceeding permitted levels of wastewater constituents including BOD, TSS, and pH.

Table 4: Sewer Receipts / Sewer Service Charge Historical Summary					
Fiscal Year	**DWWTP**	**IWWTP**	**Total**	**Percent of Total Domestic**	**Percent of Total Industrial**
2006-2007	$7,157,438	$7,936,033	$15,093,471	47.42%	52.58%
2007-2008	$4,567,248	$7,758,735	$12,325,984	37.05%	62.95%
2008-2009	$6,736,891	$9,390,161	$16,127,052	41.77%	58.23%
2009-2010	$7,856,090	$10,353,763	$18,209,853	43.14%	56.86%
2010-2011	$8,841,595	$10,739,332	$19,580,927	45.15%	54.85%
2011-2012	$9,906,842	$12,668,994	$22,575,837	43.88%	56.12%
2012-2013	$10,091,791	$12,546,850	$22,638,641	44.58%	55.42%
2013-2014	$10,211,245	$12,704,660	$22,915,905	44.56%	55.44%
2014-2015	$10,697,866	$13,490,064	$24,187,930	44.23%	55.77%

As Table 4 above shows, domestic user revenues comprise approximately 44 percent of the revenue from Sewer Receipts, while industrial user revenues comprise approximately 56 percent in fiscal year 2014-2015. These percentages were used to split the future total revenues between domestic and industrial funds. The numbers used in Table 4 are from staff's records and are slightly different than the actual revenue reported due to accounting adjustments like accruals. These numbers were used to develop the percentage split between domestic and industrial accounts; the actual financial/accounting numbers were used to forecast future sewer receipts.

Appendix G contains the annual Sewer Receipts/Sewer Service Charge annual receipts reported by the City of Tulare. There is a slight discrepancy between the spreadsheets and the financial reports likely due to accounting adjustments such as accruals. The actual revenue from the City's financial reports were used to generate the revenue figures, past and current.

b. IRS BAB interest reimbursement

The Series 2009 Bonds were issued as taxable Build America Bonds. The City is eligible for a cash subsidy payment from the United States Treasury equal to 35 percent of the interest payable on the Series 2009 Bonds. This revenue is pledged to the payment of the Series 2009 Bonds and all Parity Debt.

IRS rebates for both the 2009 Bonds and the Solar Farm are accounted for in this account. The largest amount is associated with the 2009 Bonds. The revenue was allocated based upon the percent benefit each major function received from the debt financing. The debt financing was for $44 million resulting in 27 percent to the DWWTP, 71 percent to the IWWTP, and 2 percent to the industrial sewer collection system.

c. Miscellaneous revenue – Southern California Edison rebate

The Southern California Edison rebate is a performance-based incentive for all output from the 1 MW solar panel system over its initial five years of operation. The rebate began January 1, 2012.

5. Expense

Costs were allocated to three categories, operating, capital improvement projects, and debt service. The following tables include summaries of those costs based upon the current expenditure levels, Scenario 1A.

Table 5: Ten Year Average Annual Major Function Summary Expenditures (2015 $)

Expense Category	Wastewater Domestic	Wastewater Industrial	Sewer Domestic	Sewer Industrial	Storm Drain
Operations	2,315,425	3,602,138	1,003,758	334,586	217807
Capital Projects	100,000	400,000	460,161	0	0
Debt Service	3,696,810	9,458,180	0	1,061,789	0
Total Expenditures	6,112,235	13,460,318	1,463,919	1,396,375	217,807

Table 6: Ten Year Average Domestic, Ind. and Storm Drain Summary Expenditures (2015 $)

Expense Category	Wastewater Domestic	Sewer Domestic	Total Domestic	Wastewater Industrial	Sewer Industrial	Total Industrial	Storm Drain
Operations	2,315,425	1,003,758	3,319,184	3,602,138	334,586	3,936,724	217,807
Capital Projects	100,000	460,161	560,161	400,000	0	400,000	0
Debt Service	3,696,810	0	3,696,810	9,458,180	1,061,789	10,519,969	0
Total Expenditures	6,112,235	1,463,919	7,576,154	13,460,318	1,396,375	14,856,693	217,807

a. Operating

Operating costs are defined as salaries, benefits, contracts, materials and supplies. Depreciation, cost of issuance amortization, and interest expense are not included in costs. (Depreciation is not an actual expense. The capitalized item is accounted for in the capital expenditures. Cost of Issuance Amortization and Interest expense is accounted for in debt service expenses. To include them in the Operating costs would double count the expenditures.) These accounts are listed in the detail provided in Appendix I through Appendix R.

City staff helped developed operating cost allocation through detailed review of past expenditures by account, contract and transaction.

Inflationary factors were developed to project future operating costs, Appendix H.

The Operating expenditures displayed in the appendixes represent the current level of operations and maintenance. The benchmark studies identify that this level does not meet compliance and efficient operations on a consistent basis. Under this level of operation funding, the systems will degrade, and compliance will become increasingly difficult. As a consequence, the City would likely see increased regulatory penalties from state regulators.

A detailed review of operating practices and the infrastructure of the treatment plants, the sewer collection systems and the storm drain system was performed by Ewers Engineering through Benchmark Studies. Recommendations were made for improved compliance and efficiency and

modifications to the existing list of capital projects was done to ensure a comprehensive CIP meeting regulatory compliance and supporting best management practices for the three systems.

b. Wastewater treatment plants

The WWTPs were broken into separate divisions starting fiscal year 2014-2015 in an effort to improve the accuracy for cost accounting for the two major functions. In addition, separate divisions were created for pretreatment and energy. Energy is allocated based upon the power requirements for each plant estimated by staff. The Energy Division allocation is 35 percent for the DWWTP and 65 percent for the IWWTP. The IWWTP's step-flow system requires considerably more power (and has considerably more flow) than the DWWTP's continuous-flow system.

The DWWTP division is composed of 100 percent of the domestic treatment plant costs plus 35 percent of energy costs. IWWTP division is composed of 100 percent industrial treatment plant costs plus 100 percent pretreatment costs plus 65 percent energy costs.

Past costs provide a trending of expenses. Current costs provide the most accurate operation and maintenance costs for each major function. Future costs reflect the current level of operating and maintenance inflated. Appendix G is the inflationary factors used to project future operating costs. The reader should keep in mind that the major functions have been underfunded for some time causing deferred maintenance, reduced renewal and replacement and system-wide infrastructure deterioration. The need or desire to increase costs to improve the treatment plants, the sewer collection systems and the Storm Drain system is constrained by the large debt annual payments significantly impacting sewer rates.

Management and staff have implemented much of the recommended organizational changes prescribed in the 2014 WWTF Benchmarking Study. Key management positions were filled, creating the environment for improved process changes. Today, the treatment plants are running more efficiently with significantly reduced violations.

It appears that management and staff have expended a great deal of effort to reduce operating costs to provide needed infrastructure repair and renewal.

Appendix I, Appendix J, and Appendix K provide a rollup for all Wastewater Treatment, Domestic Treatment and Industrial Treatment expenditures by account for each fiscal year, respectively. Expenditures are categorized by Salaries and Benefits (1000), Contracts/ Materials and Supplies (2000), Special Projects (5000), Capital Improvements (6000), Capital Outlay (7000), Debt Service (8000) and Transfers (9000). All expenditures were taken from the City's financial reports. This provides staff the ability to validate the numbers. Total Operating Expenditures are reflected in blue and comprise Salaries and Benefits (1000) plus Contracts/Materials and Supplies (2000). These Operating Expenditures roll up to the Domestic, Industrial, Wastewater Summary and Ten Year Financial Plan.

Transfers were not included in the Operating cost because most transfers are related to Capital Projects and are already reflected in the Capital Projects costs.

Appendix L was developed to capture the small additional cost of service from the Sewer Collection crew for work done at the treatment facilities.

Appendix M displays the total costs for the treatment plants allocated to the Domestic and Industrial plants without the Sewer Collection System crew costs. This was done to assist staff in identifying and monitoring the direct costs to operate and maintain the two plants. It also was necessary to develop the spreadsheets in this manner to allow reconciliation between the City's financial reports and the spreadsheets.

The City tracks Special Projects using 5000 accounts to provide better management of the project's budget and expenses. However, at year end, the 5000 accounts are closed into the 2000 accounts due to the operating expense classification.

The City also tracks capital project budget and expense using Capital Improvements (6000) and Capital Outlay (7000) accounts. These costs are closed to the Wastewater Capital Fund (615) at year end.

Debt Service (8000) accounts allow staff to monitor debt payments. These costs are closed out into the Balance Sheet at year end.

Transfers (9000), like Special Projects (5000), Capital Improvements (6000), Capital Outlay (7000), Debt Service (8000) reflect the movement of expenditures to the appropriate accounting structure established by the City to improve management oversight and to comply with enterprise accounting.

c. Sewer collection and storm drain systems

The Sewer Collection system, domestic and industrial, and the Storm Drain system expenditures are currently combined into one Division. This required allocating costs based on timesheets, contracts, purchase orders and account review identifying the cost to each function. This process resulted in a reasonable estimate of past, current and future costs for the major functions. The City should consider creating separate Divisions for Sewer Collection Domestic, Sewer Collection Industrial and Storm Drain.

Appendix N is the Sewer Collection System Expenditure Summary. Storm Drain costs have been allocated to Storm Drain. Appendix O is the Domestic Sewer Collection System Expenditure Summary and Appendix P is the Industrial Sewer Collection System Expenditure Summary. The spreadsheets are by account and fiscal year.

Appendices Q and R are the detailed spreadsheets for the Sewer Collection and Storm Drain systems, respectively, including the allocations by account by fiscal year. Together, they provide the base for the fiscal year costs and roll up to the other Storm Drain spreadsheets, similar to the two other major functions.

d. Capital projects

The third significant expense listed on the Financial Plan is the expense for capital projects.

Ewers Engineering reviewed the City's capital plan and walked the facilities, sewer lines, pump stations, and storm drain system to ensure a complete listing of needed projects. Projects were added with the City's review and concurrence.

To provide a realistic projection of capital expenses, a CIP model was developed incorporating risk assessment to prioritize projects. The model was populated with all the CIP projects for each utility division or major function analyzed. The model sorts projects within a CIP by risk, then funds the projects based on a user-defined annual CIP budget, from highest to lowest risk. The model incorporates the impact of inflation (increasing project costs with delays in construction), and inflates project risk for long delays beyond the originally planned construction date to reflect the increased chance of failure. The model is also structured so that projects that exceed the annual budget are funded after they are "saved up;" the model will set aside funds until the next-highest-risk project can be funded, even if it means no construction for multiple years.

The CIP risk assessment model uses a 20-year timeline for projection by default. A shorter time frame would exclude analysis of long-term projects, and a longer time frame becomes difficult to support because the bases of projections (like inflation) tend to become unrealistic.

The 10 year financial plan has a greater level of complexity than the CIP modeling projection due to multiple dependencies, incorporation of organizational goals and strategies, staffing levels in work planning, utility revenues tied to rate structures, and debt financing. As a result, its time frame is shorter.

The CIP expense projections provided for this financial planning effort are the first 10 years of a 20-year projection. Three model scenarios were developed to assess the City's projected capital costs.

e. Debt service

The second significant expense listed on the Financial Plan is the debt service expense.

The City has outstanding debt of just under $192 million with an average annual debt service payment of approximately $14 million. Past debt has funded infrastructure development, repair and replacement for the two WWTPs and sewer systems. An allocation of debt payments, Appendix S, was developed based upon the amount of debt and benefit received for each major function. Appendix T provides detailed calculation of the allocations to each of the major functions by bond and loan.

The following is a brief description of each debt financing effort.

- 2001 Sewer Revenue Bonds - Issued to finance sludge removal (Ponds 1-4), pretreatment and facilities planning, IWWTP expansion, West Side Sewer Trunk Line, the Dairy Waste Storm Drain Divide, and the Paige Avenue Industrial Sewer Line.

- 2003 Sewer Revenue Bonds - Proceeds were used to defease the 1993 Bonds, the 1996 Bonds and the 2000 Bonds. In addition, funds were provided for the DWWTP nitrification/denitrification, IWWTP nitrification/denitrification, land acquisition, effluent

pipeline extensions, gunite and compact trains, sludge drying beds lining, and electricity cogeneration.

- 2006 Sewer Revenue Bonds - Issued to finance the Industrial Sewer Pipeline Replacement, the IWWTP Upgrade & Expansion, and the Levin Trunk Sewer.
- 2009 Sewer Revenue Bonds - Used to finance the completion of the IWWTP upgrade and expansion, the design of DWWTP Expansion, the South Tulare Industrial Sewer, and the Levin Trunk Sewer.
- 2010 Sewer Revenue Bonds - Proceeds were used to finance the construction of a new expanded headworks for the City's DWWTP and construction of a sewer trunk conveying wastewater from areas in the north and east of the City.
- 2012 Sewer Revenue Refunding Notes - Refunded a portion of the Series 2001 Sewer Revenue Bonds.
- 2013 Sewer Revenue Refunding Bonds - Refunded the remaining outstanding principal of the Series 2001 Bonds and 2003 Sewer Revenue Bonds for debt service savings.
- 2015 Sewer Revenue Refunding Bonds - Refunded the outstanding Series 2006 Bonds and a portion of the Series 2010 Bonds.

Table 7 provides a summary of the Sewer/Wastewater outstanding debt as of fiscal year 2015-2016.

Table 7: Sewer/Wastewater outstanding debt

Series	Original	Outstanding
2001	$20,000,000	$0
2003	$42,700,000	$0
2006	$78,900,000	$0
2009	$54,775,000	$54,775,000
2010	$19,425,000	$8,725,000
2012	$10,580,000	$8,761,629
2013	$32,855,000	$29,325,000
2015	$84,555,000	$84,555,000
Subtotal Bonds	$343,790,000	$186,141,629
Subtotal Loans/Lease		$5,273,856
Total Outstanding Debt		**$191,415,485**

For more information regarding the City's Sewer/Wastewater Fund outstanding debt, see the Comprehensive Annual Financial Report (CAFR) on the City's web page, or the Bond Official Statement.

f. CIP funding scenarios

For the three primary scenarios developed, operating and debt service expenses remain the same, with the risk, time to project funding, and project costs varying with different annual budget amounts.

Scenario 1A

Current funding level (minimum funding): Under the current capital funding allocation, the City has budgeted capital funding of $500,000 to the Wastewater Division, $500,000 allocation for the Sewer Collection systems, and none for the Storm Drain system. Though the annual Wastewater Division budget should be divided between the WWTPs with a 75/25 percent split, the small budget and large financial demands in the CIP projects preclude this.

One of the highest-risk projects for the Wastewater Division requires $500,000 in 2015 dollars, annual replacement of the DAF heads in the IWWTP Sequencing Batch Reactor (SBR) basins. Under this scenario, no projects are funded to save sufficient funds for the first year of implementation (because the $500,000 price is increased by the inflation rate for a year). After the second year, all of the funding is reserved for the annual DAF head replacement project, and no other projects can be funded. This scenario funds the critical DAF head replacement project annually, though the cost of the project exceeds $500,000 by a greater margin, thanks to inflation.

Scenario 1B

This scenario has the same initial funding constraints as Scenario 1A, but adheres to the $500,000 budget ceiling for all 20 years of analysis. As with the previous scenario, the City can't afford the DAF head replacements in the first year with inflation. The second year's accumulated funding permits purchase of the DAF heads and of a one-time project. Succeeding years fund the DAF head replacement project intermittently, because the project cost is greater than the $500,000 total annual capital funding.

Scenario 2

The CIP is funded at the minimum level to complete the current CIP list in 20 years. The utilities require the following annual capital funding to accomplish a 20-year completion:

- Wastewater Division: $1.8 million/year
- Sewer Collection: $3.2 million/year
- Storm Drain Collection: $5.7 million/year

Note that this is not an optimal funding strategy. The faster the City can fund its CIPs, the less debt financing is used, the less they cost its customers, and the faster the City reduces non-compliance risk.

Scenario 3 (recommended):

This scenario funds the Wastewater Division at a higher rate for the first four years and reduce the annual CIP funding thereafter to quickly complete the highest-risk projects and minimize the long-term impact to the City's customers. The following annual funding levels complete the CIPs in twenty years under this approach:

- Wastewater Division: $2.2 million/year for the first 4 years, $1.5 million/year afterward
- Sewer Collection: $3.2 million/year
- Storm Drain Collection: $5.7 million/year

g. Type 3 projects explanation and summary

CIP projects can be categorized into three classes according to their impact on the City budget, per the following table:

Table 8: CIP project categories

Type	*Project description*
1	Ongoing, periodic costs or a cost over several years in a programmed O&M expenditure
2	One-time costs, typically for capitalized O&M projects
3	Large capital projects that expand capacity or capability of the utility

Type 3 projects are typically characterized by three primary attributes:

- **Large scale:** Type 3 projects involve multiple interconnected projects or a single, significant project that rises above the capacity of staff to handle construction, or in many cases, management. (Replacement of one of the WWTPs, for instance, is a Type 3 project because its scale and complexity would require much greater funding and management than current staffing could accommodate. WWTPs, like Tulare's, degrade over time and with use, particularly as concrete and metal are exposed to low-pH and/or high-chloride environments. The WWTP will likely be replaced processing unit-by-processing unit, rather than as a stand-alone construction adjacent to the current WWTP. But the scale of the replacement and the complexity of interleaving working processing units with those under construction remains.)
- **Long timeframe for implementation:** The time frame necessary to plan for and construct a Type 3 project varies with the project, but it can be several decades long. Complete replacement of a WWTP should not be necessary for 50-80 years, for example. The impact of inflation in longer timeframes tends to magnify the financial impact of Type 3 projects to annual budgets.
- **Lack of definition:** Though City management recognizes the need for Type 3 projects, the projects tend to lack specificity. In the case of replacing a WWTP, the City cannot design the plant it will need in 50-80 years because many critical factors will not be known until shortly before processing units are replaced, like flow rates, effluent requirements, regulatory reporting requirements or even available technology. As the need for a Type 3 project nears, its design-critical factors will be established, and projects can be refined from conceptual level to construction level drawings and specifications.

Type 3 project importance and identification

The long timeframe associated with Type 3 projects removes their urgency. (By definition, they're not emergency projects.) But the importance of Type 3 projects to City operations and their potential budget impacts demand planning.

The City has identified eight Type 3 projects associated with the Wastewater and Sewer Collection divisions. They are summarized below with their challenges, conceptual solutions, and capital expense estimate in 2015 dollars.

- **Domestic Plant 2MGD expansion:** The flow maximum for the current Domestic WWTP is 6.0 million gallons per day (MGD). Under the City's Waste Discharge Requirements (WDR), the City must demonstrate a capacity of 8.0 MGD to exceed its 6.0 MGD rating, requiring a 2.0 MGD expansion.
    - Solution: The increase in flow capacity can be attained in a number of ways in the Domestic WWTP, particularly given the recent process changes that eliminate the solids production from the Domestic WWTP. The remaining process changes could be accommodated within the existing plant footprint through expanding some existing treatment units. Estimate: $5 million. Probable implementation: 2025 (This assumes City will obtain State's approval for delay of implementation.)
- **Electrical Conductivity (EC) removal projects:** The City's WDR also sets a maximum sodium concentration of the greater of 110 mg/L or background water quality until April 2021, when the limit will revert to 69 mg/L. This will be difficult for the City to attain without an additional treatment process; the WDR notes the Industrial WWTP has average effluent levels of approximately 140 mg/L, and one of the groundwater wells never gets below 110 mg/L of sodium concentration. Treatment processes for sodium reduction are notoriously capital-, energy-, and waste-intensive.
    - Solution: Additional process units in each of the Domestic and Industrial WWTPs as either sidestream or primary flow treatment coupled with pretreatment requirements would reduce electrical conductivity in the wastewater influent for both WWTPs. Treatment process has not been identified. Estimate: $10 million. Probable implementation: 2030. (This assumes City will obtain State's approval for delay of implementation.)
- **Energy Savings projects:** WWTPs are an excellent source of energy production because of the gas production capacity of the influent and treatment by-products and because of the large footprint usually available on a WWTP and associated lands. The City has taken advantage of both of these factors with gas production and solar energy generation and plans to offset its WWTF energy consumption more in the future.
    - Solution: Solar production has demonstrated a high benefit/cost ratio, and the City is exploring options for partnerships and stand-alone methane-based electricity production and/or gas sales to retail nearby. Estimate: $1 million. Probable implementation (midpoint): 2030.
- **Tertiary Treatment for the WWTPs:** Drought has increased the value of WWTP effluent that can be used to irrigate crops for human consumption, but tertiary treatment and additional effluent constraints are required.
    - Solution: Tertiary treatment will require additional treatment, most likely chlorination or ultraviolet (UV) units just upstream of the WWTP effluent discharge. The City is exploring which treatment process will be most beneficial and is examining the potential for private partnership to construct the treatment units. Estimate: $2.5 million for each WWTP. Probable implementation: 2025.

- **WWTP replacement program:** Type 3 projects for each of these programs would provide funding for ongoing treatment unit and support facility replacement and expansion of treatment capacity and capability as needed.
    - Solution: Regulations are expected to become more restrictive for wastewater effluent, particularly in the Central Valley, just as available groundwater supplies are expected to be more challenging for quantity and quality. Accordingly, replacement treatment units and capability enhancements should be valued at least at replacement cost for the current WWTPs. In addition, piecemeal unit replacements cannot take advantage of the economies of scale available in constructing large, single-project replacements, which increases the anticipated replacement costs. Estimate: $50 million for the Domestic WWTP, $80 million for the Industrial WWTP. Probable implementation: 2059 for the Domestic WWTP and 2075 for the Industrial WWTP.
- **Sewer system replacement:** Just as WWTP units degrade with use and time, so do the pipelines, manholes, and pump stations that supply them – and for the same reasons. Degradation is accelerated under conditions of high BOD and COD, extreme pH (5.0>pH>11.0), and high TSS and chlorides.
    - Solution: The City has proposed $5M per year to replace pipelines and manholes, which would replace approximately 6.8 miles/year on average, taking approximately 35 years to replace all 236 miles of the combined domestic and industrial sewer systems.

Estimating Type 3 project impacts and planning

To estimate the capital cost of construction of the eight Type 3 projects identified so far, the impacts of project uncertainty, inflation, and return on investment have been considered.

- **Project uncertainty:** Per project estimation standards, a contingency should be included in the project expense to accommodate the degree of uncertainty about the project. Conceptual projects typically have contingencies of 30-50 percent, and the selected contingency for the City's Type 3 projects has been set at 30 percent.
- **Inflation:** A long-term inflation rate of 3.5 percent was selected upon discussions with City financial staff and evaluation of historical rates. This is a conservative rate given recent historically low inflation rates, but is very low when compared with the double-digit annual inflation experienced in the 1970s.
- **Return on investment:** When the City sets money aside in reserve accounts, those reserves can generate income, estimated at 1.25 percent on a long-term basis based on conversations with City financial staff.

Together, these factors can increase the eventual expense of Type 3 projects considerably, particularly those requiring decades to implement.

Lastly, to get a rough understanding of the rate impacts of each of these projects, the beneficiary of each project has been allocated to the Domestic or Industrial systems, per Table 9.

Table 9: Wastewater and Sewer division Type 3 projects						
Project		Benefit		Est. 2015 Cost ($)	Completion Date	Constr. Cost ($)
		Dom.	Indust.			
WW101	Domestic Plant 2MGD expansion	100%	0%	7,150,000	7/1/2025	9,914,500
WW102	Electrical Conductivity (EC) removal projects (WWTP)	50%	50%	14,300,000	7/1/2030	23,308,600
WW103	Energy Savings projects	50%	50%	1,430,000	7/1/2030	2,330,900
WW104	Tertiary Treatment Domestic Plant	100%	0%	3,575,000	7/1/2025	4,957,300
WW105	Tertiary Treatment Industrial Plant	0%	100%	3,575,000	7/1/2025	4,957,300
WW106	WWTP replacement program: Domestic	100%	0%	60,500,000	7/1/2059	258,178,400
WW107	WWTP replacement program: Industrial	0%	100%	96,800,000	7/1/2075	710,089,700
WW108	Sewer system line replacement	100%	0%	7,150,000	12/31/2049	156,954,079

Industrial system impacts

If the cost for each project is divided per the rough estimate of benefit above, the Industrial responsibility amounts to nearly $730 million over the next 60 years. If debt financing becomes part of the funding mechanism for these projects, the financing cost would add approximately 90 percent of the project capital cost, if the City's recent debt-financing is used as a model.

6. Funds available

Funds Available, Appendix U, was developed to show how much discretionary funds are available to management and/or the Board to deal with emergencies and/or unfunded activities, programs or projects. Funds Available is defined as the Sewer/Wastewater Fund cash + receivables – payables. It is NOT equivalent to Fund Balance. (Fund Balance is a public sector accounting term reflecting the accumulation of assets minus liabilities, added to or subtracted from owner's equity.)

Table 10 below includes the calculated Funds Available. At the end of fiscal year 2014-2015, the Sewer/Wastewater Fund has approximately $5 million of discretionary funds. This is in addition to the $5 million Plant & Equipment Reserve. Using funds from the Plant & Equipment Reserve requires Board approval.

A simple approach to calculating future Funds Available is to deduct expenses from revenue and add it to the previous fiscal year's Funds Available. This calculation is shown in the Ten Year Financial Plan Scenarios. However, fiscal years 2010-2011, 2011-2012, 2012-2013, 2013-2014, and 2014-2015 are actual calculations of Funds Available from the City's financial reports for those years, as displayed in Table 10. Fiscal year 2015-2016's calculation results from the previous year's Funds Available less the net of revenues minus expenses.

Table 10: Funds Available

Fiscal Year 2010-2011	Fiscal Year 2011-2012	Fiscal Year 2012-2013	Fiscal Year 2013-2014	Fiscal Year 2014-2015
$10,731,646	$4,836,588	$8,246,519	$6,240,224	$5,277,898

7. Analysis

The DWWTP and the Domestic Sewer Collection System are adequately funded when revenue and costs are allocated to each function and fund a CIP program to reasonably address compliance and risk at the current level of operations and maintenance. However, in addition to needed increased system maintenance, there are eight significant future projects that are expensive but not well defined and are not reflected in the financial plans. These projects are discussed in the CIP section.

The IWWTP and the Industrial Sewer Collection Treatment System are underfunded by approximately $400,000 annually over the 10 years at the current level of operations and maintenance. Given that 91 percent of revenue comes from sewer receipts/sewer service charge, a review of sewer rates is warranted, depending on the scenario the City pursues.

The storm drain system has been substantially underfunded for many years. A lack of maintenance, equipment renewal and replacement and capital projects have allowed the system to substantially deteriorate. The funding needed to improve the system to a level of efficient use and reduce flooding is approximately $5 million averaged annually. Currently, the General Fund and the sewer service charge are the only sources of funding. The Sewer/Wastewater Fund provides annual maintenance of the system at approximately $200,000 growing to $250,000 annually. This does not reflect increased maintenance needed to benefit from groundwater replenishment and flood elimination.

Appendix T provides the Fund Available detailed calculation.

a. Sewer/wastewater rates

As previously stated, sewer service receipts comprise 91 percent of the revenue for the Sewer/Wastewater Fund. Ewers Engineering surveyed the rates for domestic and industrial users to evaluate both the appropriate level and comparison to surrounding communities in 2015.

- Residential rates are high (second from the highest) for the comparator group.
- Non-residential, non-SIU rates are generally high, and in aggregate are third in the comparator group.

- SIU rates are low (second from the lowest).

The report on the survey recommended no increase in residential rates at this time. Industrial rates showed that they could and should be increased due to the needed funding for increased maintenance and capital projects. The report included the following recommendations:

- Implement a flat rate for a usage charge (particularly for non-residential, non-SIU customers).
- Evaluate sewer charges for schools.
- Conduct a sewer rate study.
- Evaluate SIU wastewater strength charges.
- Consider expanding the range of wastewater metrics for assessment and billing to EC/salinity.

The City has had a past practice of assuming the utilities, with the exception of the Storm Drain system, were equally split. Evaluation of the revenue and expenses documented in this report indicated that there were substantially more expenditure costs for the Industrial utilities than previously identified or allocated. Therefore, an increase in rates generating an additional $2,000,000 annually is warranted.

The Storm Drain System needs significant added funding. The General Fund pays for the maintenance of the storage basins for flood control. The City pays for maintenance of the system using Sewer/Wastewater Fund revenues. The operations and maintenance level has been at a minimal level and the lack of capital projects has allowed the system to degrade, creating the need for substantial funding. The City will have to evaluate its ability to generate substantial revenue to improve the system to a sustainable level.

8. Conclusion/recommendations

The City should account for the Domestic and Industrial sewer collection and the Storm Drain systems separately, similarly to the treatment plants.

The City should consider supporting diversification in its SIUs, which could provide significant revenue to the City utilities and reduce the impact of an SIU leaving the City.

The DWWTP and domestic sewer collection system are adequately funded at this time and can fund the needed increase in capital projects.

The IWWTP and industrial sewer collection system are inadequately funded for needed capital projects and need an additional $2,000,000 annually, likely requiring a rate increase.

The Storm Drain system is significantly underfunded and needs $5,000,000 annually for needed maintenance and capital projects.