Inland Empire Utilities Agency

Asset Management Plan

Fiscal Year 2022/23

Acknowledgments

This Asset Management Plan was developed by staff members of the Inland Empire Utilities Agency. The Agency gratefully acknowledges the important contributions of the authors of the various sections of this plan. In particular, the authors of the Asset Management System Summaries put forth a great deal of effort to develop system summaries that are proving to be a valuable tool in guiding asset management decisions.

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Executive Summary

The Inland Empire Utilities Agency is committed to providing services for its rate payers to reliably meet the business goals approved by the Agency's Board of Directors. This commitment requires the Agency to diligently and carefully manage their assets. Through asset management, the Agency can coordinate decisions and take actions that allow them to meet these business goals at the lowest lifecycle cost.

This Asset Management Plan is intended to be a useful document for those who have a deep understanding of the Agency as well as for those who are only somewhat familiar with it. To meet the needs of both audiences, this plan contains introductory and overview chapters on the Agency's function, service area, business goals, and future growth (Chapters 1 – 4) as well as more detailed information on the Agency's asset valuation, financial projections, and physical assets (Chapters 5 – 7).

The current values for Agency assets are $845 million for replacement and $534 million for depreciation. The various components of these values are summarized in Table 5-1.

The Long-Range Plan of Finance (LRPF) aligns the Agency's financial capacity with long-term service objectives. The LRPF uses forecasts to provide insight into the Agency's future financial capacity so that Agency strategies can achieve long-term sustainability of financial and service objectives. Development of the LRPF is ongoing, with a complete robust and dynamic LRPF model anticipated in summer 2015. Some of the proposed features of the new financial model include extending the scope from 10 to 50 years, execution of multiple "what if" scenarios to highlight the effect of certain variables, and on-screen graphic presentations to more effectively communicate the alternatives and outcomes.

The Agency's physical assets are described in Chapter 7, Asset Management System Summaries, where they are organized according to the following systems:

1. Agency-wide Projects
2. Regional Water Recycling Plant No. 1 (RP-1)
3. Regional Water Recycling Plant No. 2 (RP-2)
4. Carbon Canyon Water Recycling Facility (CCWRF)
5. Regional Water Recycling Plant No. 4 (RP-4)
6. Regional Water Recycling Plant No. 5 (RP-5)
7. Recycled Water Distribution (RW) & Ground Water Recharge (GWR) Systems
8. Inland Empire Regional Composting Facility (IERCF)
9. Agency Lift Stations (LS)
10. Regional Sewer System (RS)
11. Non-Reclaimable Wastewater System (NRW)
12. Agency Laboratory (Lab)
13. Agency Headquarters (HQ)
14. Business (BIZ) & Process Automation Control (PAC) Networks

Each system summary comprises six sections: an asset profile, a capacity profile, an asset rating, key issues, history of key assets, and potential projects. Of particular note is that the system summaries identify both existing and potential projects to address needed rehabilitation, replacement, and upgrades to assets. As such, these summaries provide key information for budgeting and project planning.

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1. Introduction

1.1. Purpose of the Asset Management Plan

The Asset Management Plan presents the physical assets of the Inland Empire Utilities Agency and discusses the funding required to manage these assets to deliver the services expected by customers.

1.2. Full Economic Cost of Infrastructure Service Delivery

The cost of providing infrastructure services depends on the standard, or level of service, required by the Agency and the community. The Agency must show the full cost of providing that level of service so that they can set a realistic level of service based on customer expectations and appropriate service fees. The cost of infrastructure asset services is a function of the lifecycle costs and the current position of the asset in the asset lifecycle, as shown in Figure 1-1.

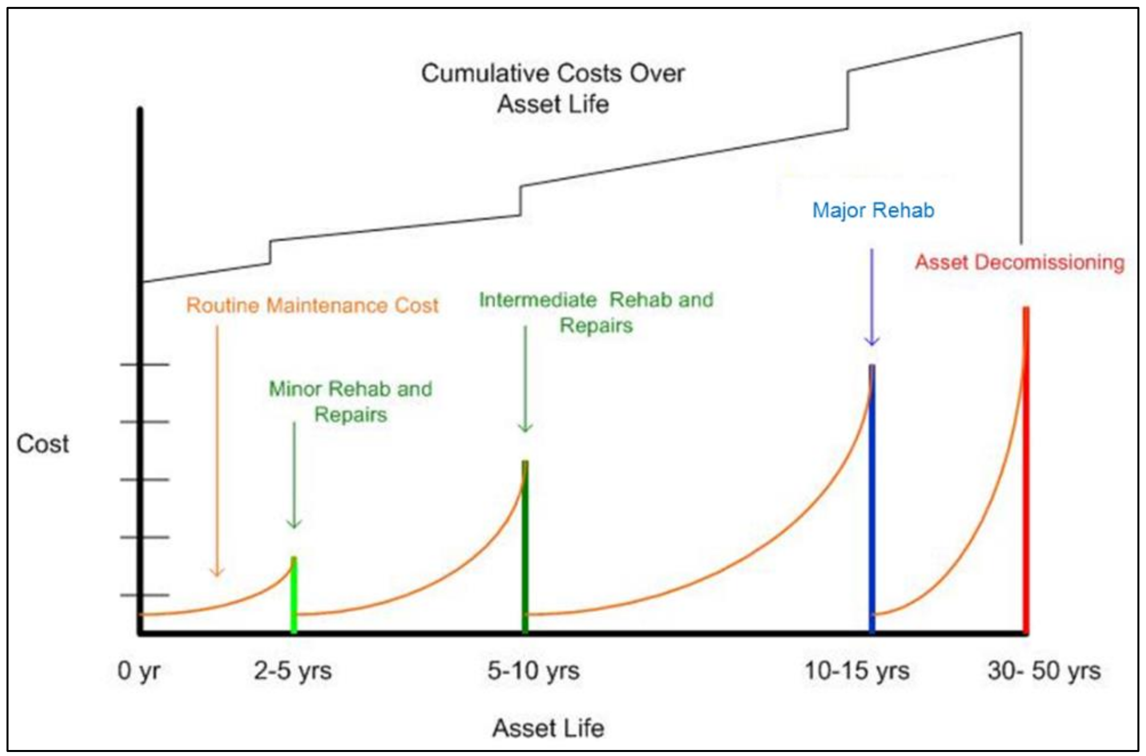

Figure 1-1: Lifecycle Cost

The Agency is better able to make decisions when they consider the lifecycle cost of assets. If costs increase in one area, then a suitable reduction or trade-off must be reflected in another area. For example, in order for the Agency to reduce operating and maintenance cost or business risk exposure, they can either invest capital or improve the offered levels of service.

2. Inland Empire Utilities Agency Overview

2.1. Service Area

The Inland Empire Utilities Agency is a regional wastewater treatment and water agency that provides sewage treatment, biosolids handling, and recycled water to the west end of San Bernardino county. Its 242-square-mile service area includes the cities of Upland, Montclair, Ontario, Fontana, Chino, Chino Hills; the Cucamonga Valley Water District, which services the City of Rancho Cucamonga; and the unincorporated areas of San Bernardino County, including the Chino Agricultural Preserve.

The Agency, a special assessment district, is governed by a five-seat publicly elected Board of Directors. Each director is assigned to one of the five divisions: Division 1 – Upland/Montclair; Division 2 – Ontario/Agricultural Preserve; Division 3 – Chino/ Chino Hills; Division 4 – Fontana; Division 5 – Rancho Cucamonga. The regional technical and policy committees provide information on technical and policy issues and include representatives from each of the contracting agencies.

Five regional water recycling plants are used to treat raw wastewater from the Agency's service area: Regional Water Recycling Plant No. 1 (RP-1), located in the City of Ontario; Regional Water Recycling Plant No. 2 (RP-2), located in the City of Chino; Regional Water Recycling Plant No. 4 (RP-4), located in the City of Rancho Cucamonga; Carbon Canyon Water Recycling Facility (CCWRF), located in the City of Chino; and Regional Water Recycling Plant No. 5 (RP-5), located in the City of Chino.

The Agency has two main service areas: Northern Service Area and Southern Service Area. The area north of Riverside Drive in Ontario is referred to as the Northern Service Area, and the area south of Riverside Drive is the Southern Service Area. The Northern Service Area is about 162 square miles and has two active treatment plants, RP-1 and RP-4, and one decommissioned treatment plant, RP-3. The Southern Service Area has CCWRF, RP-2, RP-5, and the Agency's Administration Headquarters, certified by *Leadership in Energy & Environmental Design*.

Along with these facilities, the Agency maintains and operates a desalter facility in the City of Chino (Chino I Desalter) on behalf of the Chino Basin Desalter Authority and a biosolids composting facility in the City of Rancho Cucamonga (Inland Empire Composting Facility) on behalf of the Inland Empire Regional Composting Authority. The Agency is also the representative of the Metropolitan Water District of Southern California for the contracting agencies. Figure 2-1 shows the Agency service area.

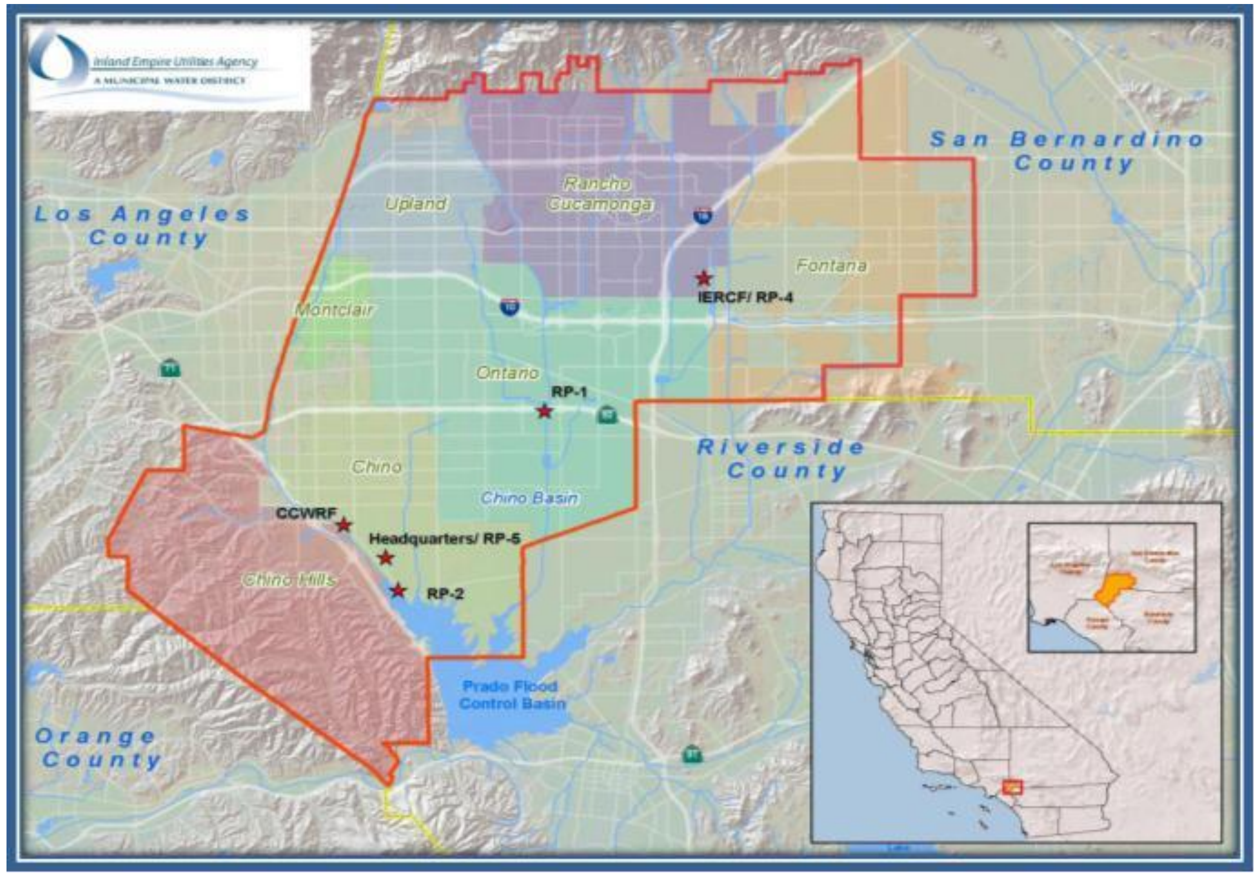

Figure 2-1: Agency Service Area

3. Agency Business Goals

3.1. Background of Agency Policy

Agency policy goals have guided the Agency's decisions and actions in executing their mission, while maintaining their values. Over the last several years, the Agency has categorized these Agency-wide policy goals into nine themes: (1) conservation and water quality, (2) technological innovation, (3) rate stabilization and cost effectiveness, (4) operational and maintenance efficiency, (5) strategic planning and capital implementation, (6) waste management and resource use, (7) interagency relationships and community partnerships, (8) fiscal accountability and regulatory compliance, and (9) staff training, development, and wellbeing. Each budget cycle, these Agency-wide policy goals guide them in developing the capital improvement program, operational budget, and organizational goals and objectives.

As a way to define the Agency's levels of service (LOS), the Agency held several workshops in 2011 with their Board of Directors. The levels of service developed during these workshops focused primarily on the Agency's operational functions. In early 2013, staff recommended that the levels of service be developed into more broad-based business goals. The Agency further decided that to better develop Agency Business Goals they should include input from their stakeholders, which include their Board of Directors, staff, Technical Committee members, and Policy Committee members.

3.2. Purpose of Agency Business Goals

Agency policy goals have guided the Agency's decisions and actions in executing their mission, while maintaining their values. To define the mission, vision, and values, the Agency looked to the needs of their stakeholders and the value of service provided to the public. To develop Agency-wide business goals, the Agency reviewed their existing policy goals and refined these goals according to their current and future needs. The Agency Business Goals sets the framework for developing additional planning documents that will shape and guide the Agency's fundamental decisions and actions over the next several years.

The adopted Agency Business Goals are fundamental to the development of several planning documents, including the Agency Strategic Plan, the Integrated Water Resources Plan, the individual Facility Master Plan Updates, and the Asset Management Plan. For any organization to remain relevant and effective, it must be able to prepare for change and to adapt. As illustrated in Figure 3-1, the Agency Business Goals must be continually evaluated as part of the planning process to ensure that the Agency meets the current and future needs of the region.

Figure 3-1: Relevance of Agency Business Goals to the Planning Process

3.3. Structure of Agency Business Goals

The Agency Business Goals were categorized into six main areas: (1) fiscal responsibility, (2) workplace environment, (3) business practices, (4) water reliability, (5) wastewater management, and (6) environmental stewardship. Within each business goal, the Agency established several objectives to support that business goal. For example, within water reliability, the Agency established the beneficial use of recycled water. For each objective, the Agency developed a commitment to define the level of service that they will provide. For example, the Agency is committed to developing the recycled water infrastructure, so they meet the objective of reusing 50,000 AFY by 2025. The structure of the Agency Business Goals is shown in Figure 3-2.

Figure 3-2: Structure of Agency Business Goals

3.4. Adopted Agency Business Goals

The remainder of this chapter presents the adopted Agency Business Goals, with each business goal presented on a single page.

A. Business Goal: Fiscal Responsibility

The Agency will safeguard their fiscal health through organizational efficiency, adoption of balanced multiyear budgets, and rates that (1) meet full cost-of-service targets, (2) maintain a high-quality credit rating, and (3) preserve established fund balance reserves to effectively address short-term and long-term economic variability. Furthermore, the Agency will provide open and transparent communication to educate member agencies on the Agency's fiscal policies.

1. **Funding & Appropriation (Agency Management; Financial Planning; Accounting; Fiscal Management)**

   Objective: To appropriately fund operational, maintenance, and capital investment costs.
   Recommended Commitment: The Agency will adopt service rates and fees that fully support the costs of service and provide a reliable and steady flow of operating revenue to support all operational expenses, capital replacement, and debt service costs. In addition, the Agency will ensure that service rates and fees support their goal to sustain high-quality commitment levels.

2. **Budget Planning (Agency Management; Financial Planning; Accounting; Fiscal Management)**

Objective: To forecast as accurately as possible costs for operation, repair and replacement, capital improvement, and debt service in an effort to provide financial stability for the Agency and member agencies.
Recommended Commitment: The Agency will provide multiyear forecast for costs of operation, repair and replacement, capital investment, and debt service to support the Agency's Board and member agencies' adoption of multiyear budgets and rates, enhancing the Agency's dependability and stability.

3. **Reserves (Financial Planning; Accounting; Fiscal Management)**

Objective: To preserve fund reserves that sustain the Agency's long-term fiscal health and high-quality credit rating and that ensure their ability to effectively address economic variability.
Recommended Commitment: The Agency will adopt financial policies to establish and preserve fund reserves above legally or contractually mandated levels so that they can maintain commitment levels. In addition, the Agency will support short- and long-term funding requirements. The Agency will also sustain their long-term fiscal health and high-quality credit rating to reduce future borrowing costs.

4. **Creditworthiness (Financial Planning; Accounting; Fiscal Management)**

Objective: To sustain a high-quality credit rating and debt-service-coverage ratio to safeguard the Agency's fiscal health and reduce future borrowing costs.
Recommended Commitment: The Agency will continue to maintain the credit rating of AA+. The rating reflects the very strong credit quality of the largest participants, supported by an implied unlimited step-up and by the wholesaler's robust financial metrics and competitive sewer rates.

B. Business Goal: Workplace Environment

The Agency is committed to providing a positive workplace environment by recruiting, retaining, and developing a highly skilled team dedicated to their mission, vision, and values.

1. **Mission, Vision, and Values (All Agency Staff and Board)**

Objective: To uphold Agency Business Goals, objectives, and commitment levels that support and advance the Agency's mission, vision, and values.
Recommended Commitment: The Agency will require the highest standard of ethical conduct from all Agency staff, promoting prudent leadership, integrity, collaboration, open communication, respect, accountability, high quality, passion, and efficiency.

2. **Employer of Choice (Human Resources; Agency Management)**

Objective: To be an employer of choice.
Recommended Commitment: The Agency will provide a work environment that will attract and retain highly skilled, motivated, professional, and committed employees.

3. **Training (Agency Management; Human Resources)**

Objective: To provide employees with state-of-the-art skills and knowledge to meet current and anticipated Agency needs.
Recommended Commitment: The Agency will facilitate and provide opportunities for staff to further their personal and professional development in support of maintaining a highly skilled workforce.

4. **Staff Safety (Safety; Human Resources; Agency Management)**

Objective: To promote and ensure a safe, healthy work environment to protect employees and stakeholders.
Recommended Commitment: The Agency will have no more than one day of lost time because of work-related illness or injury per 1,000 days worked.

C. Business Goal: Business Practices

The Agency is committed to applying ethical, fiscally responsible, and environmentally sustainable principles to all aspects of business and organizational conduct.

1. **Efficiency and Effectiveness (All Departments)**

Objective: To promote standards of efficiency and effectiveness in all Agency business practices and processes.
Recommended Commitment: The Agency will integrate lean techniques to evaluate their current business practices and processes and will identify ways to improve the quality, cost, and value of their services to the member agencies and the public.

2. **Customer Service (All Departments)**

Objective: To provide excellent customer service that is cost-effective, efficient, innovative, and reliable.
Recommended Commitment: The Agency will respond to member agencies and meet the Member Agencies' expectation for enhanced value-added services. The Agency will solicit stakeholder feedback on performance and goal alignment each year.

3. **Regional Leadership and Community Relations (Agency Management; Planning; Engineering)**

Objective: To cultivate a positive and transparent relationship with stakeholders to enhance quality of life, preserve heritage, and protect the environment.
Recommended Commitment: The Agency will partner with stakeholders on common issues to create and implement integrated and innovative solutions, minimize duplication of efforts, and support education and outreach to the public. Furthermore, the Agency will incorporate member agencies and regional water agencies into their various related projects and programs to achieve a transparent and broader regional representation.

4. **Policy Leadership (Agency Management; Planning; Engineering)**

Objective: To effectively guide, advocate, and campaign for the development of policies and legislation that benefit the region that the Agency serve.
Recommended Commitment: The Agency will promote a collaborative approach to develop positions on policies, legislation, and regulations that affect Agency policy objectives.

D. Business Goal: Water Reliability

The Agency is committed to developing and implementing an integrated water resource management plan that promotes cost-effective, reliable, efficient, and sustainable water use along with economic growth within the Agency's service area.

1. Water Use Efficiency and Education (Planning; Engineering; Public Information)

***Objective*:** To promote water-use efficiency through public education to enhance water supplies within the region and exceed state goals for reduction in per capita water use within the Agency's service area.
***Recommended Commitment*:** The Agency will reduce water use in their service area to less than 200 gallons per capita per day by 2018.

2. New Water Supplies (Planning; Engineering)

***Objective*:** To support member agencies and regional water agencies, the Agency will develop reliable, drought-proof, and diverse local water resources and supplemental water supplies to reduce dependence on imported water supplies.
***Recommended Commitment*:** The Agency will promote efforts to reduce demand for imported water during dry and normal years and to store imported water into the Chino Groundwater Basin during wet years. In addition, The Agency will support maximizing the beneficial use of existing water infrastructure, while meeting future increased demands through investment in local water resources, supplemental water supplies, and conservation efforts.

3. Recycled Water (Planning; Engineering; Operations & Maintenance)

***Objective*:** To support maximizing the beneficial reuse of recycled water to enhance reliability and to reduce dependence on imported water.
***Recommended Commitment*:** The Agency will finish developing a recycled-water infrastructure and will support the member agencies in achieving reuse of 50,000 AFY by 2025.

4. Groundwater Recharge (Planning; Engineering; Operations & Maintenance)

***Objective*:** To maximize all sources of groundwater recharge.
***Recommended Commitment*:** The Agency will support the recharge of all available stormwater and maximize the recharge of recycled water within the Chino Groundwater Basin. Furthermore, the Agency will pursue the purchase and storage of cost-effective supplemental water supplies.

E. Business Goal: Wastewater Management

The Agency will develop master plans for Agency systems and manage and construct these systems to ensure that when expansion planning is triggered, designs and construction can be completed to meet regulatory and growth needs in an expeditious, environmentally responsible, and cost-effective manner.

1. Capacity (Planning; Engineering; Construction Management)

***Objective*:** To maintain capacity within systems and facilities to meet essential service demands and to protect public health and environment.
***Recommended Commitment*:** The Agency will ensure that systems are managed and constructed so that 90 percent of capacity is never exceeded.

2. On-Time Construction (Engineering; Construction Management)

***Objective*:** To ensure capital projects are designed and implemented in a timely and economically responsible manner.
***Recommended Commitment*:** The Agency will design and construct facilities through efficient project management to ensure that 80 percent of projects are completed on schedule and 90 percent of projects are on budget.

3. Biosolids Management (Operations & Maintenance)

***Objective*:** To manage all Agency-produced biosolids in a US EPA compliant, fiscally prudent, and environmentally sustainable manner.
***Recommended Commitment*:** The Agency will ensure that 95 percent of the capacity of the Inland Regional Compost Facility is used, that all biosolids produced by the Agency are treated at this facility, that Agency solids generation is minimized through efficient dewatering operations, and that all compost is marketed for beneficial use.

4. Energy Management (Planning; Engineering; Operations & Maintenance)

***Objective*:** To optimize facility energy use and effectively manage renewable resources to achieve peak power independence, contain future energy costs, achieve statewide renewable energy, distribute generation and greenhouse-gas reduction goals, and provide for future rate stabilization.
***Recommended Commitment*:** The Agency will achieve peak power independence by 2020 by implementing renewable projects, energy management agreements, and operational efficiencies.

F. Business Goal: Environmental Stewardship

The Agency is committed to the responsible use and protection of the environment through conservation and sustainable practices.

1. Regulatory Compliance (Compliance; Operations & Maintenance)

***Objective*:** To comply with all federal, state, and local laws at each Agency facility.
***Recommended Commitment*:** The Agency will have no more than two notices of violation annually from the State Water Resources Control Board, Air Quality Management District, or Non-Reclaimable Waste System for all Agency-owned and operated facilities.

2. Good Neighbor Policy (Compliance; Operations & Maintenance)

***Objective*:** To control odors at all Agency facilities for the purpose of improving the environment and being a good neighbor to the local community.
***Recommended Commitment*:** The Agency will perform a quarterly odor-monitoring assessment to develop actual and acceptable baseline odor thresholds. Acceptable baseline thresholds will be used to measure treatment plant performance and drive necessary capital improvements.

3. Response and Complaint Mitigation (Compliance; Operations & Maintenance)

Objective: To investigate any environmental issue or complaint received at any Agency facility and to respond appropriately and promptly.
Recommended Commitment: The Agency will immediately respond to any event that threatens public health and safety and will respond within five working days to any non-emergency complaint or suggestion.

4. **Environmental Responsibility (Agency Management; Planning; Engineering)**

   Objective: To strive to implement actions that enhances or promotes environmental sustainability and preservation of the region's heritage.
   Recommended Commitment: The Agency will consider and assess environmental sustainability, public use, and heritage preservation options for all programs and projects.

4. Future Demand and Growth

4.1. Wastewater Flow Projection

The Agency conducts wastewater flow forecasts annually, deriving the forecast from three components: (1) historical wastewater flow trends; (2) per capita or per dwelling-unit wastewater-generation factors; and (3) expected future growth numbers provided by contracting agencies. Using these projections, the Agency determines future demands on their facilities and anticipates needed modifications to Regional Water Recycling Plants (RWRP).

Based on analyses of the three components, the Agency has made ten-year flow projections for each of their RWRPs and for the service area as a whole. The Agency then compares the projected flows to current and future-planned plant capacities, presenting alternative scenarios that reflect possible diversions, bypasses, and recycle streams. For these forecasts, the "tributary area flow" is defined as raw wastewater flow from the service area that is a natural tributary to a particular RWRP without pumps, diversion, or bypasses. In contrast, the "treated influent flow" is the actual flow that is received and treated at the RWRP. The treated influent flow is different from the tributary area flow because the RWRPs are interconnected, allowing some of the tributary flow to be re-routed between plants. In addition, treated influent flow includes the recycle streams generated during solids processing that are sent back to the plant's headworks for additional treatment.

4.2. Wastewater Flow Trends

Over the past decade the IEUA service area has experienced an increase in indoor water use efficiency as a direct result of drought, shifting public policy, more efficient building and plumbing codes, and effective conservation program campaigns. This increased efficiency has decreased the volume of wastewater flows received by IEUA treatment plants by approximately 10% since 2010. While the flows have continued to decrease, the regional population has continued to grow. The combination of an increased population but reduced wastewater flow has resulted in an increase in the strength of the wastewater coming into IEUA's treatment facilities. This trend of increased wastewater strength is expected to continue as both the population and regional water efficiency continue to increase. Current and future wastewater treatment plant expansions are driven by the increased strength of wastewater flows to the facilities, rather than the volume of flows to the facilities.

While wastewater flows have decreased from FY 09/10, recycled water use has increased. This increase in recycled water utilization can be attributed to the San Bernardino Avenue Lift Station and the Montclair Lift Station. The Montclair Lift Station pumps wastewater from portions of Montclair, Upland, and Chino to IEUA's RP-1 and CCWRF treatment plants. The San Bernardino Ave Pump Station pumps a portion of the flow from the City of Fontana to IEUA's RP-4 treatment plant. Together, these lift stations help shift flows that would naturally flow from one portion of the service area to a different treatment plant to balance flows and keep water in the northern portion of the service area. This shift in flows allows IEUA to maximize the potential for recycled water use. These lift stations also increase regional system flexibility and allow the treatment plants to operate as an interconnected system.

Equivalent Dwelling Unit (EDU) activity has increased from FY 19/20 to FY 20/21 with the addition of 5,281 EDUs to the region compared to the addition of only 3,435 EDUs the previous fiscal year. The additional EDUs added in FY 20/21 are 3,732 EDUs lower than the RCAs projections of 9,013 EDUs and 1,281 EDUs more than the IEUA Budgeted Projections of 4,000 EDUs. Two sets of projections exist to allow for conservative estimates on both the flow and financial aspects of EDUs. The RCAs projections are required under the Regional Sewage Service Contract and serve as a planning tool for plant treatment capacity. Under the Regional Sewage Service Contract, RCAs who report EDU projections that are lower than what the regional experiences may have building moratoriums imposed. For this reason, the RCAs may make projections conservatively high. Budgeted projections on the other hand are used by IEUA to project future needs. To ensure fund availability, budgeted projections are conservatively low. The result of both sets of projections is the assumption that projections are conservative, ensuring IEUA treatment plants can handle the added load while also ensuring the agency does not over project fund availability.

Figure 4-1: Regional Plant Wastewater Flow History

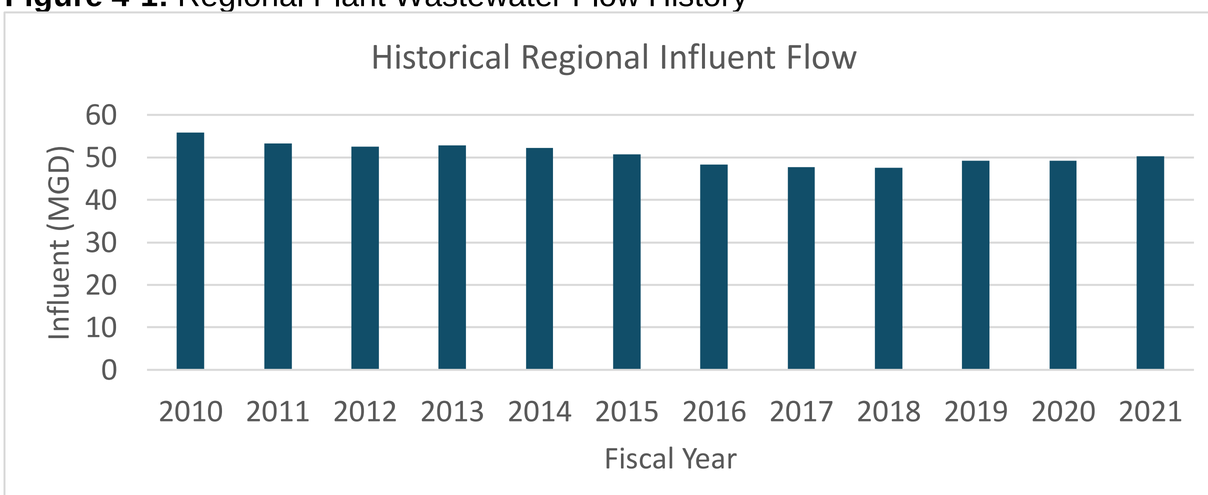

Figure 4-2: Regional Plant Wastewater Flow History

5. State of the Assets Summary

5.1. Asset Valuation

The replacement and depreciated values for Agency assets are summarized in Table 5-1, as of June 30, 2021.

Table 5-1: Agency Replacement and Depreciated Values

Asset Group	Acquisition Value		Book Value (Depreciated Value)		Book Value / Replacement Value
Land	$	14,652,323.84	$	14,652,323.84	100%
Land Improvements	$	31,250,379.54	$	13,643,262.87	44%
Wells/Basins	$	132,723,273.51	$	47,997,296.83	36%
Collection, Outfalls & Transfer Lines	$	36,721,245.30	$	21,654,042.13	59%
Interceptors, Tie-Ins	$	163,665,559.56	$	124,314,460.20	76%
Recycled Water System	$	6,756,916.35	$	5,236,258.76	77%
Reservoirs, Basins, Ponds	$	123,305,562.11	$	79,136,242.56	64%
Treatment Plants, Pump Stations	$	257,704,039.76	$	121,782,876.50	47%
Plant Office Buildings	$	48,362,434.99	$	32,589,159.92	67%
Office Facilities	$	14,883,694.28	$	10,439,833.47	70%
Equipment	$	275,057,681.17	$	79,895,585.91	29%
Office Furniture & Fixtures	$	4,467,644.46	$	1,500,853.45	34%
Autos & Trucks	$	4,162,657.16	$	685,275.99	16%
Computer Software	$	15,645,690.67	$	3,898,489.40	25%
CSDLAC Capacity Rights	$	12,467,002.13	$	4,286,747.13	34%
SAWPA Capacity Rights	$	1,266,638.00	$	1,266,638.00	100%
MWD Connections	$	48,075.86	$	20,031.60	42%
Corps of Engineers Connections	$	198,891.13	$	-	0%
Contributions - LAND	$	43,489.41	$	11,823.11	27%
Organizational Costs	$	1,939,804.67	$	1,073,945.21	55%
Total	**$**	**1,145,323,003.90**	**$**	**564,085,146.88**	**49%**

6. Long-Term Asset Management

6.1. Long-Range Plan of Finance (LRPF) Model

The Long-Range Plan of Finance (LRPF) aligns the Agency's financial capacity with long-term service objectives. The LRPF uses forecasts to provide insight into the Agency's future financial capacity so that Agency strategies can achieve long-term sustainability of financial and service objectives. Actions taken in the short-term can have implications over multiple years. By projecting financial trends over a long period, the Agency can better anticipate and prepare for necessary adjustments and reduce any sudden impact to its stakeholders and operations. This projection allows for the most cost-effective funding strategy for supporting operations and capital requirements that are in line with established policies and goals of the Agency. As outlined in the Agency's financial policies are to

- Maintain programs that are self-supported through user fees and charges;
- Levy moderate rate increases to support program requirements;
- Employ cost containment measures that will ensure achievement of debt-coverage ratio targets recommended by the Board of Directors;
- Maintain adequate fund balances consistent with bond covenant requirements; and
- Minimize the Agency's borrowing costs.

Development of the LRPF is ongoing, the basis for the capital projection requirements was the Agency's Ten-Year Capital Improvement Plan (TYCIP) which was extended to cover an additional 20-year period.

This chapter will be developed further in subsequent Asset Management Plans to present results of modeling work.

7. Asset Management System Summaries

7.1. Introduction

To assemble a comprehensive description of assets, the Agency developed summaries of each asset management system. These summaries provide the Agency with a useful tool to determine those assets that are most critical to focus on. The Agency assets are organized according to the following twelve systems.

1. Agency-wide Projects
2. Regional Water Recycling Plant No. 1 (RP-1)
3. Regional Water Recycling Plant No. 2 (RP-2)
4. Carbon Canyon Water Recycling Facility (CCWRF)
5. Regional Water Recycling Plant No. 4 (RP-4)
6. Regional Water Recycling Plant No. 5 (RP-5)
7. Recycled Water Distribution (RW) & Ground Water Recharge (GWR) Systems
8. Inland Empire Regional Composting Facility (IERCF)
9. Agency Lift Stations (LS)
10. Regional Sewer System (RS)
11. Non-Reclaimable Wastewater System (NRW)
12. Agency Laboratory (Lab)
13. Agency Headquarters (HQ)
14. Business (BIZ) & Process Automation Control (PAC) Networks

When appropriate, systems have been divided into subsystems to aid in the logical presentation of information. For example, the regional water recycling plants have been divided into the following treatment process subsystems.

- Preliminary Treatment
- Primary Treatment
- Secondary Treatment
- Tertiary Treatment
- Solids Treatment
- Dewatering Treatment
- Auxiliary Systems

The Recycled Water & Ground Water Recharge Systems have been divided into the following pressure zone subsystems.

- 800-foot pressure zone
- 930-foot pressure zone
- 1050-foot pressure zone
- 1158-foot pressure zone
- 1299-foot pressure zone
- 1630-foot pressure zone (east and west)

Each summary has been developed by engineers with extensive operations experience to ensure that the systems have been thoroughly evaluated and the critical assets identified.

7.2. Structure of Asset Management System Summaries

The Asset Management System Summaries have been developed with a common base structure, providing a foundation for their continued use and development. The summaries are updated to reflect the current condition of each system. Each system summary follows the structure described below, beginning with a schematic, followed by a project summary table, and culminating in a summary sheet or sheets.

- **System Schematic** – Displays a schematic representation of the system.
- **Project Summary Table for System** – Lists the existing projects relating to the system along with yearly budget allocations over a ten-year period. Please note that Agency departments will individually budget for routine replacement and rehab of system assets, and most of these budgets items will not be summarized in the project summary tables.
- **Subsystem Summaries** – Describes the subsystem of a given system on a single 11 x 17-inch sheet divided into the following six sections:
  - Asset Profile – Describes the assets and their primary functions.
  - Capacity Profile – Describes the key capacity-design values for assets in terms of average flow requirements.
  - Asset Ratings – Presents a summary score on a 1 (best) to 5 (worst) scale, based on the current performance of the asset. The standards for the scoring scale are defined in Appendix A.
  - Key Issues – Lists treatment process and equipment issues (deficiencies) based on performance data and Operations and Maintenance Department Staff knowledge and will indicate which existing project will address the issue. If an issue is not being addressed by an existing project, then the need for a potential project will be noted within the key issue description.
  - History of Select Assets – Provides dates of past capital improvement project activity and of planned or completed condition-assessment reports.
  - Potential Projects – Lists potential projects to consider for addressing deficiencies not being addressed by existing projects.

7.3. Future Development of Asset Management System Summaries

The Agency will continue to maintain, update, and expand Asset Management System Summaries for future Asset Management Plans. The Asset Management System Summary for the Regional Sewer System could only be partially developed for this Asset Management Plan and will be developed further in the future.

7.4. Asset Management System Summaries

This section starts with Table 7-1 that summarizes Agency-wide projects relating to multiple systems—that is, those not included in project tables for individual systems—followed by the Asset Management System Summaries.

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Asset Management System Summary – Agency-wide

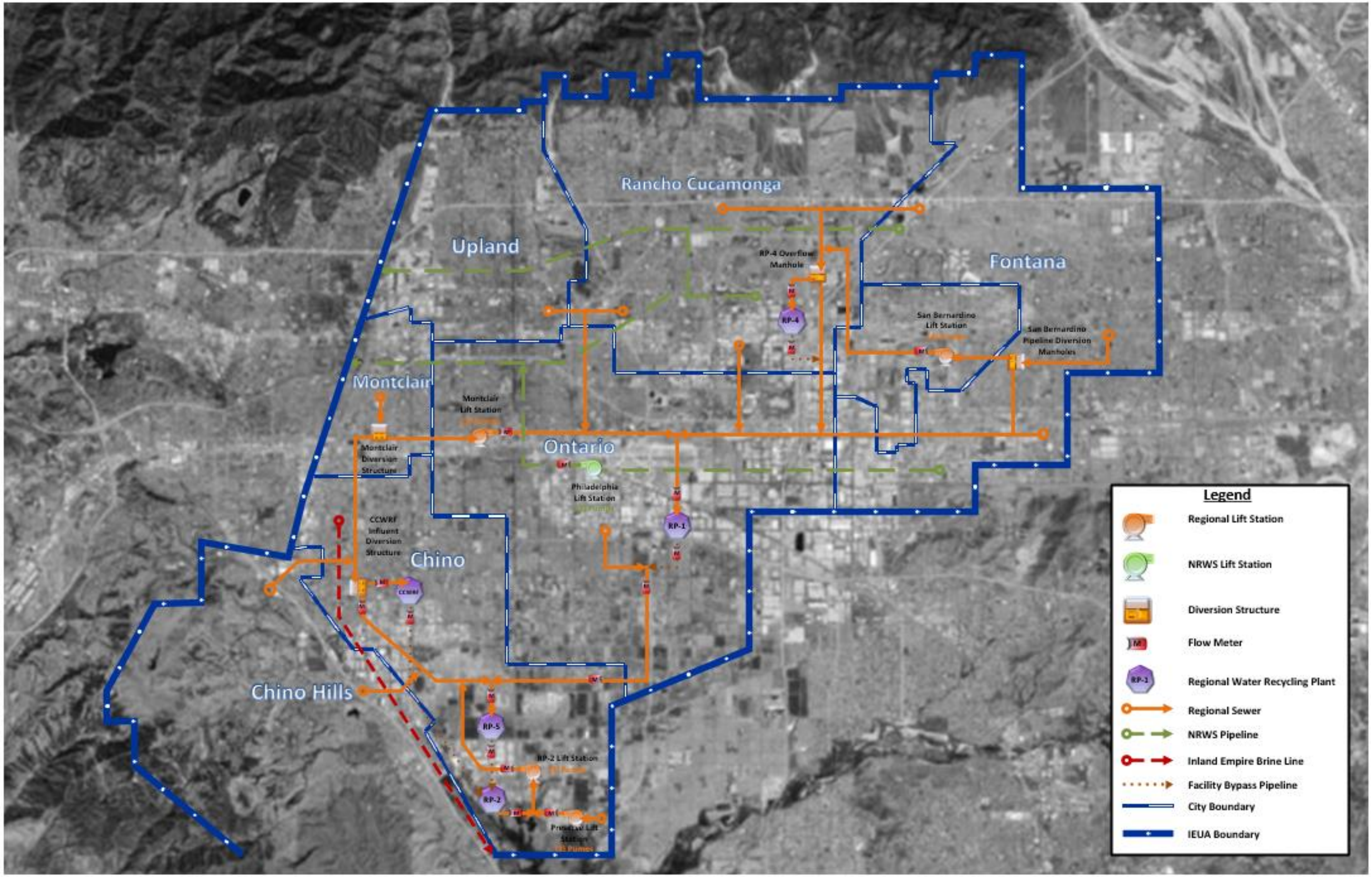

Figure 7-1: Agency-wide – Schematic

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Table 7-1: Agency-wide Project Summary

#	Project Number[1]	Project Name	Project Description	Fund[2]	Project Type[3]	Fiscal Year Budget (Dollars)										
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Ten-Year Total
1	PA21002	Agency Wide Coatings (Lucia Diaz)		RO	OM	50,000	150,000	388,810	445,975	353,354	260,955	-	-	-	-	1,649,094
2	EN23034	Agency Wide EV Charging Stations (James Simpson)		GG	CC	500,000	600,000	-	-	-	-	-	-	-	-	1,100,000
3	FM21003	Agency Wide Facilities Rehab & Repairs (Lucia Diaz)		GG	OM	54,636	56,275	57,964	59,703	61,494	63,339	65,239	67,197	69,213	71,290	626,350
4	FM20005	Agency Wide HVAC Replacements (Lucia Diaz)		GG	RP	100,000	100,000	-	-	-	-	-	-	-	-	200,000
5	EN23021	Agency Wide Infiltration and Inflow Study (Ryan Ward)	Pipeline Analysis, an engineering firm specializing in wastewater collection systems, will conduct field tests and monitoring.	RO	OM	300,000	300,000	-	-	-	-	-	-	-	-	600,000
6	PA22003	Agency Wide Paving (Julianne Frabizio)	Most of the Agency's paved areas are aging and require periodic rehab or repairs. This project will ensure paving for each facility is properly maintained. Asphalt pavement repairs are evaluated for repair and replacement needs. Agency-wide annual maintenance for paving.	RO	OM	602,500	400,000	400,000	400,000	400,000	400,000	400,000	400,000	400,000	400,000	4,202,500
7	FM21005	Agency Wide Roofing (Julianne Frabizio)	Most of the Agency's Regional Plants have buildings that are over 25 years old. The building's roof systems are aging and require periodic rehab or repairs. This project will ensure roof replacements and rehab for each facility are completed. A roofing assessment for the Regional Plants is currently being evaluated for repair and replacement needs. Agency wide annual maintenance for roofing	GG	CC	1,733,500	250,000	1,050,000	250,000	1,050,000	0	0	0	0	0	4,333,500
8	EP21004	Agency Wide Vehicle Replacement (Lucia Diaz)		GG	RP	60,000	60,000	60,000	160,000	179,108	184,481	190,015	195,715	201,587	207,634	1,498,540
9	PA17006	Agency-Wide Aeration		RO	OM	181,000	-	-	-	-	-	-	-	-	-	181,000

#	Project Number[1]	Project Name	Project Description	Fund[2]	Project Type[3]	Fiscal Year Budget (Dollars)										
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Ten-Year Total
		(James Spears)														
10	EN24033	Annular Seals (Ryan Ward)		RO	CC	-	380,000	-	-	1,000,000	-	-	-	-	-	1,380,000
11	EN19023	Asset Management Planning Document (Francis Concemino)	Solicit for qualified firms to provide the consulting service to meet the goals of the AMP and seek specialized consultants/contractors to implement recommended improvements to the AMP.	RO	OM	400,000	-	-	-	-	-	-	-	-	-	*400,000*
12	WR23001	6 TAFY AWPF & Injection Facilities (Liza Munoz)		WC	CC	7,000,000	7,000,000	53,000,000	61,000,000	52,000,000	8,000,000	0	0	0	0	188,000,000
13	PL26001	Advanced Water Purification Facility (Liza Munoz)		RO	CC	4,500,000	4,500,000	31,000,000	37,000,000	31,000,000	5,000,000	0	0	0	0	113,000,000
14	PL18001	Calif. Data Collab. WUE Data Analytics (Elizabeth Hurst)		WW	OM	5,000	2,500									7,500
15	WU23002	CBWCD LEAP (Lisa Morgan-Perales)		WW	OM	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	300,000
16	WU23006	CII Device Rebates (Lisa Morgan-Perales)		WW	OM	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	1,800,000
17	WU23019	CII Turf Replacement Rebates (Lisa Morgan-Perales)		WW	OM	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	1,800,000
18	WR23004	Discover the Environment and Water (DEW): An Education Program and Facility (Andrea Carruthers)		WW	RE	250,000	115,356	115,356	115,356	115,356	0	0	0	0	0	711,425
19	PL21001	Flow & Loading Supplemental Study (Kenneth Tam)		OM	RO	150,000	150,000									300,000
20	FM23002	GapVax Replacement (Frank Sotomayor)		RP	RO	750,000										750,000

#	Project Number[1]	Project Name	Project Description	Fund[2]	Project Type[3]	Fiscal Year Budget (Dollars)										
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Ten-Year Total
21	EN23079	GG Assessment Projects (Ken Monfore)	GG condition assessments.	OM	GG	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	500,000
22	EN22010	GG Asset Management Project (Ken Monfore)	Solicit for qualified firms to provide the consulting services to meet the goal of the AM program and seek contractors to implement condition assessment activities or needed repairs or rehab. The activities will be specific to the Recycled Water Pumps Station and Reservoir Systems	CC	GG	50,000	50,000	50,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	7,150,000
23	FM23001	Heavy Equipment Replacement (Frank Sotomayor)		RP	RO	670,000	670,000									1,340,000
24	WR21029	Implement. of Upper SAR HCP - Recy Water (Joshua Aguilar)		OM	WC	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	2,500,000
25	WR21028	Implement. of Upper SAR HCP - Wtr Benefit (Joshua Aguilar)		OM	WW	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	2,500,000
26	WU23015	Landscape Design Services (Lisa Morgan-Perales)		OM	WW	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	30,000	300,000
27	WU23018	Landscape Irrigation Tune-Ups (Lisa Morgan-Perales)		OM	WW	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	5,000,000
28	WU23009	Landscape Training Classes (Lisa Morgan-Perales)		OM	WW	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	200,000
29	WU23004	Large Landscape Retrofit Program (Lisa Morgan-Perales)		OM	WW	400,000	400,000	400,000	400,000	400,000	400,000	400,000	400,000	400,000	400,000	4,000,000
30	WU23011	Member Agency Administered Project (Lisa Morgan-Perales)		OM	WW	139,379	139,379	139,379	139,379	139,379	139,379	139,379	139,379	139,379	139,379	1,393,788
31	EN23085	New Regional Project PDR's FY22/23 (Jason Marseilles)	Create preliminary design reports for new project requests from Operations and Maintenance.	CC	RC	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	5,000,000
32	EN22040	NFPA 70E required labels (James Simpson)	Apply required additional NFPA 70E Arc Flash Labels that are missing at RP-1, RP-4, and Remote Lift Stations. Update existing ETAP power system model files for RP-1 & RP-4. Perform Arc Flash Studies for Remote Lift Stations.	RC	CC	75,000										75,000

#	Project Number[1]	Project Name	Project Description	Fund[2]	Project Type[3]	Fiscal Year Budget (Dollars)										
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Ten-Year Total
33	EP23002	North Major Facilities Repair/Replacement (Jon Florio)		RO	RP	600,000	600,000	600,000	600,000	600,000	600,000	600,000	600,000	600,000	600,000	6,000,000
34	EN20064	NSNT Odor Complaints Mitigation (Josh Biesiada)	The project will design and install a complete 21 inch VCP sewer bypass to the double siphon at the Cucamonga channel and 8th Street. Coordination with the San Bernardino County Flood Control and Two property owners will be required as the bypass will be installed within their Right-of-Way. In addition, the siphon will be plugged and abandoned in place. At this point, it is not expected to fill the annular space of the siphon	NC	CC	1,500,000	700,000	0	0	0	0	0	0	0	0	2,200,000
35	AM23002	Old VFD Replacement Recycled Water (Brian Noh)		WC	CC	250,000	250,000	250,000	600,000							1,350,000
36	AM23001	Old VFD Replacement Wastewater (Brian Noh)		RO	CC	250,000	250,000	250,000	600,000							1,350,000
37	PL23001	PFAS Investigation (Pietro Cambiaso)		RO	OM	250,000										250,000
38	PL19001	Purchase Existing Solar Installation (Pietro Cambiaso)		RC	CC						3,500,000					3,500,000
39	EN22006	RC Asset Management (Ken Monfore)	Solicit for qualified firms to provide the consulting services to meet the goal of the AM program and seek contractors to implement condition assessment activities or needed repairs or rehab. The activities will be specific to the Regional Lift Stations.	RC	CC	250,000	250,000	2,400,000	8,000,000	8,000,000	8,000,000	8,000,000	8,000,000	8,000,000	8,000,000	58,900,000
40	PL23003	Regional Water Resiliency Planning (Joshua Aguilar)		WW	OM	120,000	150,000	30,000								300,000
41	WU23005	Residential Device Rebates (Lisa Morgan-Perales)		WW	OM	178,884	178,884	178,884	178,884	178,884	178,884	178,884	178,884	178,884	178,884	1,788,838

#	Project Number[1]	Project Name	Project Description	Fund[2]	Project Type[3]	Fiscal Year Budget (Dollars)										
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Ten-Year Total
42	WU23010	Residential Pressure Regulation Program (Lisa Morgan-Perales)		WW	OM	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	1,000,000
43	WU23012	Residential Small Site Controller Upgrade Program (Lisa Morgan-Perales)		WW	OM	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	5,000,000
44	WU23020	Residential Turf Replacement Rebates (Lisa Morgan-Perales)		WW	OM	160,000	160,000	160,000	160,000	160,000	160,000	160,000	160,000	160,000	160,000	1,600,000
45	EN23000	RO Assessment Projects Facilities/Collections	Evaluate the age and quality of MCC's with E3 overloads installed to determine if the MCC needs to be replaced or just the E3 overloads. Overloads that need to be replaced need to be replaced with E300 overloads. Use of the E300's needs to include necessary wire modification and Ethernet/IP network connectivity to the RPI PRP network architecture. Upgrade of all DeviceNet devices and supported hardware to Ethernet/IP network protocol or possibly Modbus TCP/IP if Ethernet/IP is not possible.	RO	OM	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	1,500,000
45	EN22005	RO Asset Management (Facilities/Collections)	Solicit for qualified firms to provide the consulting services to meet the goal of the AM program and seek contractors to implement condition assessment activities or needed repairs or rehab. The activities will be specific to the Plant System.	RO	OM	250,000	250,000	300,000	600,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	7,400,000
46	EN23019	RO Emergency O&M Projects FY 22/23		RO	CC	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	5,000,000
47	EN20034	RO On-Call/Small Projects FY 19/20 (SHF)	The RP-1 gravity thickener cover and gear box was removed as part of an emergency project. The gearbox has a 10 week lead time and will need to be re-installed once it is received. In addition a corrosion assessment will need to be completed to verify the condition of the GT and provide recommendations for recoating.	RO	OM	500,000										**500,000**
48	EN23088	RO On-Call/Small Projects FY 22/23	Review of the design and construction administration responsibilities and submission requirements identified in	RO	OM	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	5,000,000

#	Project Number[1]	Project Name	Project Description	Fund[2]	Project Type[3]	Fiscal Year Budget (Dollars)										
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Ten-Year Total
			the Scope of Work with the Project Team members. Items such as: contract deliverables, special sequencing or phased construction requirements, special hours for construction based on Agency programs or needs, delivery dates of critical and long lead items, utility interruptions or shut down constraints for tie-ins, weather restrictions, and coordination with other project construction activities at the site shall be addressed.													
49	PL23007	RO Planning Documents		RO	OM	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	1,500,000
50	EN23089	RO Safety On-Call/Small Projects FY 22/23 (Rachael Solis)	Review of the design and construction administration responsibilities and submission requirements identified in the scope of work with the project team members. Items such as: contract deliverables, special sequencing or phased construction requirements, special hours for construction based on Agency programs or needs, delivery dates of critical and long lead items, utility interruptions or shut down constraints for tie-ins, weather restrictions, and coordination with other project construction activities at the site shall be addressed.	RO	OM	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	5,000,000
51	EN20056	RSS Haven Ave Repair/Replace from Airport (Josh Biesiada)	The scope of work includes investigating pipeline rehabilitation methods, developing an Agency standard rehabilitation specification, and rehabilitate approx. 7,400 LF of sewer pipeline on Haven Avenue in the City of Chino	RO	RP	9,000	0	0	0	0	0	0	0	0	0	9,000
52	EP23003	South Major Facilities Repair/Replacement (Joshua Oelrich)		RO	EQ	400,000	400,000	500,000	500,000	500,000	600,000	600,000	600,000	600,000	600,000	5,300,000
53	WU23008	Sponsorships & Public Outreach Activities (Lisa Morgan-Perales)		WW	OM	43,000	43,000	43,000	43,000	43,000	43,000	43,000	43,000	43,000	43,000	430,000
54	EN16021	TCE Plume Cleanup (Joel Ignacio)	The project scope will include three new groundwater monitoring wells, one new groundwater production well and approximately 30,000 feet of raw water pipeline to distribute up to	RO	OM	1,950,000	0	0	0	0	0	0	0	0	0	1,950,000

#	Project Number[1]	Project Name	Project Description	Fund[2]	Project Type[3]	Fiscal Year Budget (Dollars)										
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Ten-Year Total
			6,000 acre-feet per year of groundwater supply to the Chino II Desalter. In addition, the project will modify the existing decarbonator systems at Desalter II to treat TCE in the influent water.													
55	PL23004	Wastewater Flow & Loading Study (Pietro Cambiaso)		RO	OM	500,000	100,000									600,000
56	WR16001	Water Softener Removal Rebate Program (Kenneth Tam)		NC	OM	75,000	75,000	75,000	75,000	75,000	50,000	25,000	25,000	25,000	25,000	525,000
57	PL23005	WW Planning Documents (Pietro Cambiaso)		WW	OM	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	2,500,000

(1) Project Number – from Ten-Year Capital Improvement Project; Final Capital Project List 03-17-2014
(2) Project Fund – Administrative Services (GG), Non-Reclaimed Water (NC), Regional Composting Authority (RM), Ground Water Recharge (RW), Recycled Water (WC), Regional Capital (RC), Regional O&M (RO), or Water Fund (WW)
(3) Project Type – Capital Construction Project (CC), Capital Major Equipment Project (EQ), Operations & Maintenance Project (OM), Reimbursable Project (RE), or Capital Replacement Project (RP)

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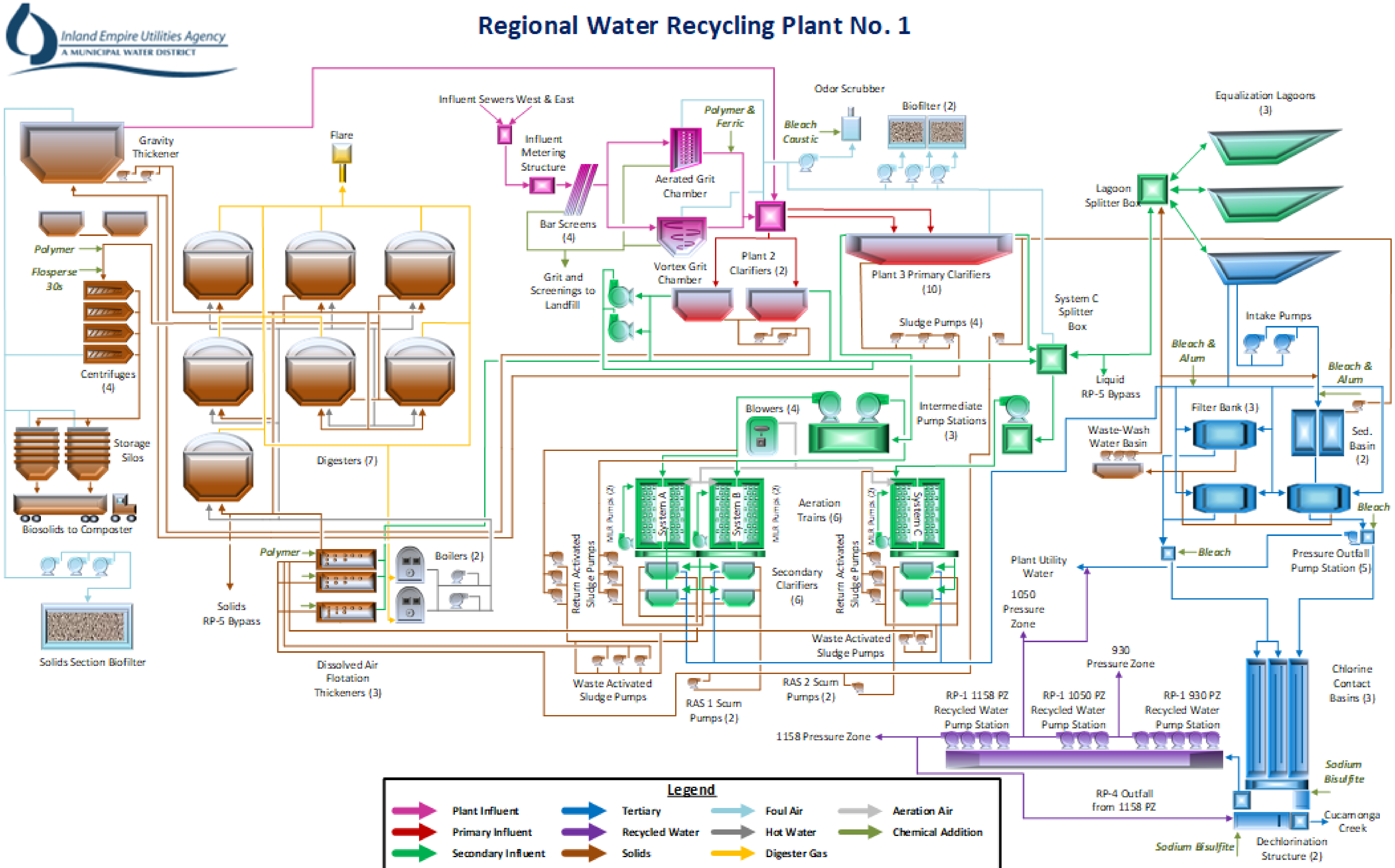

Figure 7-2: Regional Water Recycling Plant No. 1 (RP-1) – Schematic

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Table 7-2: Regional Water Recycling Plant No.1 – Project Summary

#	Project Number[1]	Project Name	Project Description	Fund[2]	Project Type[3]	Fiscal Year Budget (Dollars)										
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Ten-Year Total
1	EN26027	RP-1 & RP-4 Bird Deterrent Systems (Jason Marseilles)	Design and install deterrent devices similar to the spinners and sound machines at RP-5.	RO	OM	0	0	0	100,000	0	0	0	0	0	0	100,000
2	EN22041	RP-1 Aeration Basins UW System Improvements (James Spears)	The project shall replace the existing PVC utility water loop with stainless steel piping for service life longevity (consistent with other facilities at RP-4, RP-5). New water supply connections and hose bibs shall be added at strategic locations of the aeration basins to provide convenient water supply for instrument cleaning and housekeeping purposes	RC	RP	1,500,000	500,000	0	0	0	0	0	0	0	0	2,000,000
3	EN22022	RP-1 Air Compressor Upgrades (Pierre Cayatte)	Operations is requesting engineering to design and construct a centralized/consolidated air compressor system to provide process air for plant use. (Justin Tao has the study for RP-1).	RC	RP	390,000	3,600,000	0	0	0	0	0	0	0	0	3,990,000
4	ENxxxx8	RP-1 Boiler System Digester Gas Capacity Improvement (Jamal Zughbi)		RO	OM	0	0	0	0	0	0	0	0	0	0	0
5	EN23076	RP-1 Centrate Line Improvements (Joel Ignacio)	The scope of this project is to perform a pipeline condition/capacity assessment on the entire RP-1 centrate pipeline system. This includes the 8-inch pipeline and 6-inch pipeline alignments from the RP-1 Dewatering building to the NRW gravity pipeline on Philadelphia St. This assessment should take into account the centrate pumps	RO	OM	160,000	0	0	0	0	0	0	0	0	0	160,000

			as well for the system. At the conclusion of this project, Operations is envisioning that the recommendations from the pipeline assessment will be turned into another project to recover pipeline capacity. Defer the above and instead replace the pump impellers to match the design that was implemented during construction of the facility. During construction the impellers were redesigned from the initial plans to address updated pipeline head losses. It is possible the recently replace pumps may be using the initial plans. The new impeller design is critical to meet the expected flow rates. This does not include removal and replace of the impellers only the cost for the new material													
6	EN23000	RP-1 DeviceNet Replacement (Pierre Cayatte)		RO	OM	1,000,000	2,100,000	1,000,000								4,100,000
7	EN24020	RP-1 Dewatering Centrate Pumps (Joel Ignacio)	Project is expected to perform the following: 1. Remove existing ESSCO pumps due to poor reliability and low performance 2. Install newer and more available pumps. Xylem submersible pumps are an option, but others are available. 3. Remove and replace existing railing system to accommodate new pumps	RO	OM	0	200,000	500,000	120,000							820,000
8	EN25020	RP-1 Digester Cleaning Lagoon (DCL) Line (James Simpson)	Place a liner material at the base and sidewalls of the DCL to prevent groundwater intrusion when the DCL is used to decant solids. The lining should be constructed to support heavy equipment	RO	OM			0	100,000	600,000	0	0	0	0	0	700,000

			entry into the basin. Equipment is used to remove solids from the basin as necessary. Depending on the RP-1 Capacity Recovery project, this project may or may not be necessary													
9	EN22024	RP-1 Digester Cleaning Service Contract (Ken Monfore)	Digester cleaning.	RO	OM	0	1,000,000	1,000,000	1,000,000	2,000,000	1,000,000	2,000,000	3,000,000	3,000,000	3,000,000	17,000,000
10	EN11039	RP-1 Disinfection Improvements (James Spears)	Automate the gates leading to the aeration and emergency storage basin as well as upgrade them to modulating for better flow control.	RC	RP	8,270,000	1,190,000	0	0	0	0	0	0	0	0	9,460,000
11	EN22025	RP-1 Dump Station (Jason Marseilles)	The project would rehabilitate the headworks gate; place key FOB for waste-haulers to gain entrance to headworks through the gate; place new concrete with wash station and related collection drains to the plant; and place removable, chain-link fence with through gate to plant. The project will isolate headworks and allow entrance by waste-haulers through Key FOB at all times. Camera, perimeter alarm, and other safety and security upgrades would also be made to make station usable 7-days a week and after 3:30 PM	RO	OM	0			64,000	95,400	1,855,600	106,100	0	0	0	2,121,100
12	EN21042	RP-1 East Influent Gate Replacement (Pierre Cayatte)	The project shall replace the existing gate with a new manual gate. The installation will require a bypass of the channel and the new gate does not need to be connected to SCADA	RO	OM	520,000										520,000
13	EN19009	RP-1 Energy Recovery (James Simpson)	The project scope will be executed in phases where a consulting engineering firm will be retained by the	RO	OM	105,000										105,000

			Agency in Phase I to prepare a study and alternative analysis to maximize the beneficial use of the DG as an4energy source for long-term planning projections. Alternatives may include DG treatment to meet Southern California Gas Company requirements for direct injection into their distribution system, Power Purchase Agreements, new cogeneration system, power generation from small to mid-range turbines or similar microgrid clean energy technology, etc. The scope also includes financial analysis of viable alternatives and evaluation of applicable regulatory compliance and permitting requirements. Selected alternative will go through design-build or design-bid-build process in the following phases as part of the implementation process													
14	EN27001	RP-1 Equalization Basin #1 Access Ramp (Jason Marseilles)	Design and construct an access ramp for lagoon access.	RO	OM	0	0	0	0	35,000	106,500	300,000	0	0	0	441,500
15	EN21056	RP-1 Evaporative Cooling for Aeration Blower (Pierre Cayatte)	Add an evaporative cooling or AC system to prevent the equipment inside the blowers building from failing due to overheating	RO	OM	220,000	795,000									1,015,000
16	EN18006	RP-1 Flare Improvements (Jamal Zughbi)	Install two new 100% redundant flares and one small flare to control digester gas pressure within the RP-1 treatment plant during normal and emergency operations. This project will provide the needed flexibility and reliability to comply with the SCAQMD regulatory requirements. Along with the	RC	RP	240,000										240,000

			new flares installation, the digester gas piping system in the flare area will be upgraded to accommodate the new flare system and associated auxiliaries.													
17	EN22034	RP-1 and RP-4 Generator Control Panel Retrofit/Modernization (James Simpson)	New state of the art digital control panels and CAT digital voltage regulators shall be installed for RP-1 Generator. Please see attached project scope and quotation for detailed job scope	RO	OM	180,000										180,000
18	EN23111	RP-1 Headworks Bar Screens Improvements (James Spears)		RO	OM	300,000	3,600,000									**3,900,000**
19	EN22031	RP-1 Influent Pump Station Electrical Im (James Simpson)	The following are Operations and Maintenance's expectations and corresponding recommendations: Replace MCC 6M and 8M with new Allen Bradley IntelCenter. Look at the feasibility of just 1 MCC instead of the two separate MCCs. The new MCC could have a main tie main configuration and supply power to all 10 IPS pump VFDs. Or if the new VFDs would be free-standing like the existing IPS pump VFD # 1, 6, and 7, most of the loads could be fed out of a 480-volt distribution panel rather than an MCC. Permanently eliminate the ATSs that feed MCC 6M and 8M. Permanently eliminate all the eddy clutch drives. Install new 18 pulse VFDs for IPS pump motors # 2, 3, 4, 5, 8, 9, and 10. Replace the existing IPS VFDs # 1,6, and 7 because they are already over 13 years old, and it would make the overall project better to have all	RO	OM	750,000	750,000	7,500,000	0	0						9,000,000

			new. Evaluate each motor and make sure all are inverter duty rated with shaft ground rings. Replace as needed. Replace lighting panel LP15 and its associated transformer. Possibly replace all 10 of the IPS pumps. Pumps 1-6 are over 40 years old, and pump 7-10 are over 30 years old.													
20	EN23114	RP-1 Instrumentation and Control Enhancement (Pierre Cayatte)		RO	OM	100,000										100,000
21	EN20045	RP-1 Level Sensor Replacement (James Simpson)	Replace existing bubbler level sensor system with new ultrasonic level sensors on 18 filters.	RO	OM				485,000							485,000
22	EN24001	RP-1 Liquid Treatment Capacity Recovery (Jason Marseilles)	Based on the major recommendations resulting from the RP-1 Capacity Recovery Project PDR, the Project will consist of the following major components: · Rehabilitate preliminary and primary treatment ·Expand the Intermediate Pump Station ·Convert the existing conventional activated sludge secondary system to a membrane bio-reactor (MBR) system including fine screening consistent with RP-5 Liquid Treatment Expansion ·Modify Lagoon No. 3 piping system to allow for secondary effluent equalization eliminating the requirement to expand the tertiary treatment process ·Replace the existing odor control with a new two-stage Bio scrubber with carbon polishing	RC	RP	0	0	0	0	0	0	2,000,000	13,000,000	13,000,000	13,000,000	41,000,000
23	EN20051	RP-1 MCB and Old Lab Building Rehab (Matthew Poeske)	Scope includes detailed design and documents related to demolition and construction of the building	RO	OM	800,000	1,400,000	0	0	0	0	0	0	0	0	2,200,000

			rehab project. The project scope also includes cost for project management and construction administrative and inspection supports													
24	EN23117	RP-1 Motor Control Center 9M Upgrades (Pierre Cayatte)		RC	RP	150,000	900,000									1,050,000
25	EN23102	RP-1 New Parking Lot (Matthew Poeske)		GG	RP	100,000			500,000	600,000						1,200,000
26	EN21053	RP-1 Old Effluent Structure Rehabilitation (Jamal Zughbi)	Gate and stems are already severely corroded. Cost includes complete rehabilitation of structure and valves.	RO	OM	500,000	1,800,000									2,300,000
27	EN20044	RP-1 Plant 3 Primary Cover Replacement (James Spears)	Design a new services of primary clarifier covers which can be secured so they don't fly away in the wind but are user friendly to Operations staff who must have the ability to open and move covers as needed for inspection and housekeeping. Operations requests hinged covers to match existing hinged FRP covers with 316 SS hardware. Examples of existing FRP covers can be in drawing set D6539.	RO	OM			200,000	400,000	0	0	0	0	0	0	600,000
28	EN22027	RP-1 Repurpose Lab (Matthew Poeske)	Design, bid, and construction will be performed to allow the building to be used for a new use. It is anticipated this will include the relocation of source control from the Main HDQ to free up space and centralize this activity and provide additional office space for Operations personnel	RO	OM	755,000	1,800,000	0	0	0	0	0				2,555,000
29	EN18025	RP-1 Secondary System Rehabilitation (James Spears)	Rehabilitate the concrete surfaces and recoat the metal components of the secondary clarifiers. Replace the above ground PVC	RO	OM	0	0	0	500,000	6,700,000	1,000,000	0	0	0	0	8,200,000

			sprayer piping and provide protection from UV rays.													
30	EN23116	RP-1 Solids Electrical Panel Upgrades (James Simpson)		RO	OM	275,000	1,200,000	400,000								1,875,000
31	EN24002	RP-1 Solids Treatment Expansion (Jason Marseilles)	Based on the major recommendations resulting from the RP-1 Capacity Recovery Project PDR, the Project will consist of the following major components. Replace the existing solids thickening systems with new rotary drum thickeners to improve solids thickening. Construct three new smaller acid phase digesters to improve operational performance. Add recuperative thickening to the digestion process to increase performance and eliminate the need to construct one additional digester. Replace the existing odor control with a new two-stage Bio scrubber with carbon polishing	RC	RP	0	0	4,000,000	8,000,000	8,000,000	0	0	0	0	0	20,000,000
32	EN22044	RP-1 Thickening Building & Acid Phase Digester (James Simpson)	- Construct the RP-1 Solids Thickening Building to contain rotary drum thickeners - Construct (3) Acid Phase Digesters and all ancillary equipment for this system - Expand the RP-1 12kV electrical system - Other misc. system improvements (odor control, primary sludge VFD's, cleanouts, interm RDT, and site demolition)	RC	RP	4,500,000	27,100,000	47,340,000	42,140,000	0						121,080,000
33	EN23024	RP-1 TP-1 Stormwater Drainage Upgrades (Juilanne Frazbizio)	Repair the old discharge line and tie in a permanent pump or if unable to repair line will need to be replaced. A permanent pump and pipeline installation needs to be constructed to minimize	RO	OM	250,000	1,000,000	50,000	0	0	0	0	0	0	0	1,300,000

			potential flooding and potential permit violation of spillover into the creek.													
34	EN17042	Digester 6 and 7 Roof Repairs (Jamal Zughbi)	Repair cracks to the roof of digesters 6 and 7. This work should include the development of a performance standard and/or metric for "gas tightness" of tanks, pipes, and other components of digester gas systems. Digesters will be completely cleaned and inspected from the inside. Heavily corroded gas piping on top of the digesters will also be replaced and other piping will be coated.	RO	CC	2,300,000	1,150,000									**3,450,000**

(1) Project Number – from Ten-Year Capital Improvement Project; Final Capital Project List 03-17-2014
(2) Project Fund – Administrative Services (GG), Non-Reclaimed Water (NC), Regional Composting Authority (RM), Ground Water Recharge (RW), Recycled Water (WC), Regional Capital (RC), Regional O&M (RO), or Water Fund (WW)
(3) Project Type – Capital Construction Project (CC), Capital Major Equipment Project (EQ), Operations & Maintenance Project (O&M), Reimbursable Project (RE), or Capital Replacement Project (RP)

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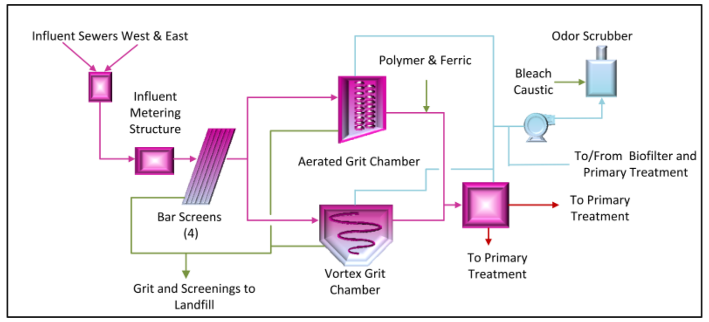
Asset Management System Summary – RP-1
Preliminary Treatment Process
1. Asset Profile



Influent Channel and Metering Station
Two main trunk lines (east and west) bring influent sewer flows into RP-1 through the influent structure with gates to divert flow to either of two Parshall flume flow meters. Flow from the influent metering station enters a common channel before the bar screening structure. A septage dump station for private haulers is located upstream of the screening equipment.

Screening Equipment
Gates divert flow to six channels, four mechanical bar screens, one manual bar screen, and one bypass channel. The 5/8-inch spaced bar screens capture large debris, protecting downstream processes. A mechanical climber rake collects debris and drops the screenings on the screening conveyance/disposal system. Liquid flow passes through the bar screen into a common channel that feeds the grit removal systems.

Aerated Grit System
Flow enters a series of three square aerated grit chambers (AGC) through five gates. Three air-lift pumps, supplied by two air blowers, pump collected grit up to the grit washing/disposal system. Air from the blowers also provides air for agitation. Liquid flows pass through gates to a common channel and then to the headworks splitter box.

Vortex Grit System
Flow from the bar screens are directed to the influent of the circular vortex grit chamber. A paddle mixer pushes flow in a circular path; grit collects at the bottom, where it is pumped to the grit washing/disposal system.

Grit Washing/Disposal System
Grit pumped from the AGC and vortex grit chamber enter the Headworks Building where it flows to two grit classifiers. The grit sinks to a submerged screw that pulls the grit out of the water and drops grit into two screw conveyors. The conveyors lift and transport the grit to a roll-off bin. The excess liquid spills out of the grit classifiers and is directed back to the bar screen structure effluent channel.

Screenings Conveyance/Disposal System
Screenings collected by the bar screens are transported by a conveyor and dropped into a hydraulic compactor. The compactor compresses the collected screenings, squeezes out excess water, and pushes the screenings to the roll-off bin.

Ferric Chloride System
Ferric chloride is added to the liquid flow after grit removal to enhance primary treatment and to control sulfide emissions. Ferric chloride can also be valved to the digesters. The ferric station consists of a truck filling station, storage tank, three chemical metering pumps, and associated piping.

Polymer System
Polymer is added the liquid flow after grit removal to enhance primary treatment. The polymer system includes a tote stand, chemical metering pump, mixing chamber, and associated piping.

Headworks Splitter Box
The headworks splitter box receives flow from both grit systems, the bar screens structure bypass, and the overflow from the solids section gravity thickener. Flow can be diverted to the Plant 3 rectangular clarifiers or to the Plant 2 circular clarifiers for primary treatment.

Odor Scrubber
Foul air collected in the preliminary and primary treatment processes is forced through the odor scrubber tower with plastic porous media, where a solution of bleach and caustic soda trickles against the air flow to oxidize hydrogen sulfide and other compounds. The odor scrubber is used to supplement the foul air treatment provided by the biofilter.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Preliminary Treatment Process	44 MGD	
Influent Channel and Metering Station		
East Sewer	42-inch	
West Sewer	42-inch	
Parshall Flumes	2 @ 55 MGD	Per Unit
Gates	2 units	
Septage Station	1 unit	
Screening Equipment		
Mechanical Screen	4 @ 27.5 MGD	Per Unit
Manual Screen	2 @ 27.5 MGD	
Gates	15 units	
Aerated Grit System		
Chambers	1 @ 44 MGD	
Pumps	3 @ 150 gpm	Per Unit
Blowers	2 @ 360 scfm	Per Unit
Gates	10 units	
Vortex Grit System		
Chamber	1 @ 20.4 MGD	
Pump	1 @ 300 gpm	
Gates	4 units	
Grit Washing/Disposal System		
Classifiers	2 @ 300 gpm	Per Unit
Conveyors	2 @ 3 wet tons per hr	Per Unit
Screening Conveyance/ Disposal System		
Conveyor	5.0 hp	
Compactor	5.0 hp	
Ferric Chloride System		
Tank	13,000 gallons	
Pumps	3 @ 37.4 gph	Per Unit
Polymer System		
Pump	1 @ 4.5 gph	
Headworks Splitter Box		
Gates	3 units	
Odor Scrubber		
Blowers	2 @ 8,000 scfm	Per Unit
Valves	2 units	> 18-inch

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Influent Channel and Metering Station	2	3	4	2
Screening Equipment	3	2	5	3
Aerated Grit System	2	4	1	2
Vortex Grit System	4	1	5	5
Grit Washing/Disposal System	3	3	3	3
Screening Conveyance/Disposal System	3	5	3	3
Ferric Chloride System	3	2	3	3
Polymer System	3	3	3	3
Headworks Splitter Box	3	N/A	N/A	N/A
Odor Scrubber	4	3	3	5

* Ratings as defined in Appendix A; General System Assets

4. Key Issues

Influent Channel and Metering Station
The east isolation gate leaks. In addition, there is currently no odor control directly tied into the influent channel.

The septage dump station is out of date and requires manual sampling of the septic flow prior to dumping. A potential project should evaluate a modern septage dump system at the most appropriate location within the Agency. The next major capital project within the preliminary treatment process may address this issue.

Screening Equipment
The bar spacing allows a significant amount of debris to reach downstream processes. A substantial number of the gates are broken and inoperable. In addition, the foul air containment leaks, as evident by internal smoke tests.

Aerated Grit System
The AGC allows large amounts of grit to pass through to downstream processes. Many of the gates are broken and inoperable. A structural condition assessment identified significant concrete degradation in the vapor space of the AGC. Project EN14019 will replace the broken gates and upgrade or replace the AGC.

Vortex Grit System
The vortex grit chamber is not operated because the grit piping modifications have not been proven effective in eliminating the difficulty establishing or maintaining the prime on the new above ground pump. Pump system is difficult to evaluate during use, priming system and bladder style discharge valve are cumbersome to use and troubleshoot.

Grit Washing/Disposal
Recent failures of the classifier and the conveyors screws have indicated excessive wear from heavy use. The availability of spare parts results in parts from both systems being pieced together to have one working system.

Screenings Conveyance/Disposal System
Most main pieces of equipment were replaced in 2015 through a Maintenance Project.

Ferric Chloride System
The ferric chloride system operates effectively, but the equipment is approaching the end of its useful life.

Headworks Splitter Box
Concrete in the vapor space is showing significant deterioration.

Odor Scrubber
The odor scrubber is a viable alternative if the primary section biofilter needs to be taken offline.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Influent Channel and Metering Station	1977 1987	Planned 2023
Screening Equipment	1977 1987	Planned 2024
Aerated Grit System	1987	Planned 2024
Vortex Grit System	1987	Planned 2024
Grit Washing/Disposal System	1977 1987 2009	Planned 2024
Screening Conveyance/Disposal System	1977 1987 2015	
Ferric Chloride System	1987 1992	
Polymer System	2015	
Headworks Splitter Box	1977	Planned 2024
Odor Scrubber	1996	

* Appendix B – Condition Assessment Reports

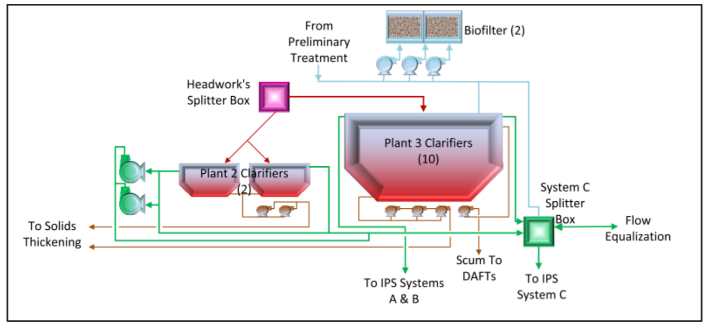
Table 4 Potential Projects

System	Project Name	Project Description
Preliminary Treatment	RP-1 Headworks Rehab	Project to comprehensively rehab and upgrade the Preliminary Treatment Process. Bar Screens and Grit/Sand Removal System.
Grit Washing Rehabilitation	RP-1 Grit Washing and Disposal Upgrades	Upgrade and repair the existing grit washer and conveyor
Influent Channel and Metering Station	Septage Dump System	Provide a modernized septage dump system at the most appropriate location within the Agency.

Asset Management System Summary – RP-1

Primary Treatment Process

1. Asset Profile



<u>Plant 3</u>
Influent Channel
Two pipes from the headwork's splitter box divert flow to the Plant 3 influent channel. Each clarifier has three gates from the influent channel to allow flow to enter each clarifier. The channel is aerated with air from blowers to keep solids in suspension.

Primary Clarifiers
The rectangular clarifiers consist of chain-driven flights, which push settled solids and collected floatable to a sludge hopper for pumping or to scum troughs for solids processing. Each clarifier consists of three or four effluent troughs with V-notch weirs. The clarifiers are covered for odor control.

Effluent Channel
Each effluent trough discharges into a common channel. Two legs with valves direct flow from the effluent channel to the intermediate pump system A&B wet well or the system C splitter box. The effluent channel is covered and has odor control ducting to the biofilter.

Sludge Pumping System
A series of valves opens and closes to direct solids collected in each clarifier to three pumps, sending flow to solids thickening processes.

Scum System
Scum collected by the primary clarifiers is directed to a common wet well. Periodically a pump will pull from the wet well and pump to solids thickening processes.

<u>Plant 2</u>
Primary Clarifiers
Flow from the headworks splitter box is directed through a flow meter and a series of valves/gates to two circular clarifiers. The clarifiers are center feed with a rotating arm to push solids to a sludge hopper and floatable to the scum removal trough. Effluent from the clarifiers is piped to the Intermediate pump station wet wells. These clarifiers are put in service when flow needs to be diverted from Plant 3, but are not used during normal operation.

Solids Pumping System
Solids collected from the Plant 2 clarifiers are directed to two pumps. The pumps send flow to solids thickening processes in the solids section.

Trickling Filter Pumps
Effluent from the west Plant 2 clarifier can be pumped via the trickling filter pumps to the system C splitter box. The effluent collects in an old trickling filter wet well and is pumped through a series of splitter boxes until it reaches the system C splitter box.

Odor Control System
Three blowers pull foul air from the Plant 3 primary clarifiers, system C splitter box, and the preliminary treatment section, forcing the air through two beds of carbon rich media to allow for the biological consumption of hydrogen sulfide and other compounds.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
<u>Plant 3</u>	33.6 MGD	
Influent Channel Blowers	 3 @ 25 hp	 Per Unit
Primary Clarifiers Flight Drives Gates	10 @ 2,400 gpd/ft^2 3,500 ft^2 5 @ 0.5 hp 34 units	Per Unit Per Unit
Effluent Channel Bladder Valves	 2 units	
Sludge Pumping System Pumps	 3 @ 412 gpm 30/20/20 hp	 Per Unit
Scum Pumping System Pump	 1 @ 130 gpm 7.5 hp	 Per Unit
<u>Plant 2</u>	15.1 MGD	
Primary Clarifiers Gates Valve	2 @ 2,400 gpd/ft^2 7,854 ft^2 4 units 1 unit	Per unit
Sludge Pumping System Pumps	 2 @ 175 gpm 15 hp	
Trickling Filter Pumps	2 @ 9,000 gpm 100 hp	
Odor Control System Media Blowers Valves	 9,293 ft^2 4.5 ft depth 2 @ 11,700 scfm 40 hp 1 @ 12,205 scfm 50 hp 15 units	 Per Unit > 18-inch

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
<u>Plant 3</u>				
Influent Channel	1	4	3	3
Primary Clarifiers	4	1	3	4
Effluent Channel	2	4	3	3
Sludge Pumping System	3	1	4	3
Scum Pumping System	3	3	4	3
<u>Plant 2</u>				
Primary Clarifiers	3	3	3	3
Sludge Pumping System	3	3	3	3
Trickling Filter Pumps	N/A	N/A	N/A	N/A
Odor Control System	4	3	4	4

* Ratings as defined in Appendix A; General System Assets

4. Key Issues

<u>Plant 3</u>
Influent Channel
The influent channel operates effectively; however, floatable solids have a tendency to collect in the channel, requiring collections crew to make semi-regular cleanings of the channel.

Primary Clarifiers
Small pieces of the chain/flight system break requiring significant maintenance activities to repair. The chain and flight of all the Primary Clarifier are experiencing extensive failures. The scum collector trough actuators are prone to failure over time/seizing. Scum collectors in primary clarifier no. 9 & 10 have been repaired by contractor. EN23088.02 will be addressing the other scum collectors.

Effluent Channel
Recent evaluations of underground piping to the intermediate pump stations have indicated extensive corrosion.

Sludge Pumping System
Lack of pumping capacity to meet needs. New project request submitted and will be addressed in EN22044.

Scum System
The floatable materials form a raft in the wet well, and are required to be vactored regularly. Mixer installed with most current upgrade project never worked, mixer plugged nearly immediately with heavy plastic and grease-bound material, unit has been abandoned. Recommend alternative style pump discharge based mixing system. EN23088.02 will be addressing the scum pumping issues.

<u>Plant 2</u>
Primary Clarifiers
The clarifiers are not covered to control odors. East clarifier drive has a leak in the seal. Condition assessment to be conducted in 2023 for the east clarifier.

Solids Pumping System
No issues require special attention.

Trickling Filter Pumps
The equipment is left over from an abandoned trickling filter system. Although it's not the original intent, the equipment is used occasionally to increase capacity of the Plant 2 system.

Odor Control System
The biofilter was constructed on top of the old trickling filter infrastructure and has experienced leaks in the past. .Issues with plugging of the perforated holes feeding to the biofilter media. To address this coating of the concrete surface is being added and enlargement of the holes are being evaluated by a consultant.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
<u>Plant 3</u>		
Influent Channel	1977 1982	Planned 2024
Primary Clarifiers	1977 1982 2007 2013-2015	No. 9 & 10 inspected in 2022. Remaining will be inspected 2024
Effluent Channel	1977 1982 2014	Planned 2024
Sludge Pumping System	1977 1982	
Scum System	1977 1982 2013	Planned 2029
<u>Plant 2</u>		
Primary Clarifiers	1966 1987 1997	Planned 2023
Solids Pumping System	1966 1985 1987	
Trickling Filter Pumps	1966	Planned 2027
Odor Control System	2008 2013	

* Appendix B – Condition Assessment Reports

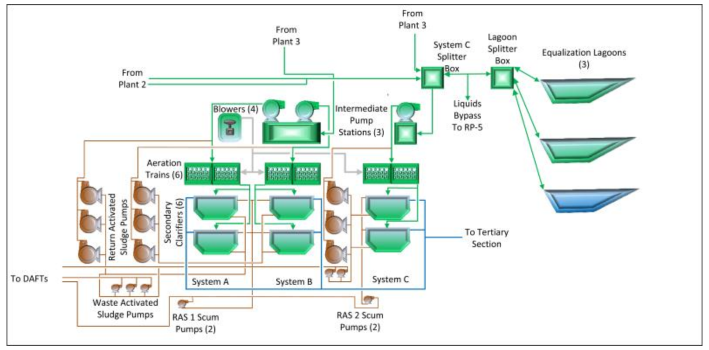
Table 4 Potential Projects

System	Project Name	Project Description
Sludge Pumping System	EN22044	Upsize the electrical feed and pumps.

Asset Management System Summary – RP-1

Secondary Treatment Process

1. Asset Profile



Intermediate Pumps Stations
Primary effluent flows to the intermediate pump station wet wells. The wet wells can divert high flows to the flow equalization system. Three sets of pumps (System A – 3 pumps, System B – 3 pumps, System C – 4 Pumps) pump to each designated aeration system.

Flow Equalization System
Primary effluent can flow to three flow equalization lagoons to hold flows and introduce them back to the intermediate pump station at a later time. Flow is diverted to the three lagoons via motorized gates. Two lagoons have floating aerators to slow the rate at which the stored flows become septic.

Activated Sludge System
The three activated sludge systems consist of two aeration trains each (six total). Influent gates divert a combined flow of primary effluent and return activated sludge to each train. Each train consists of four basins. The first basin mixes flows with a paddle mixer. The next three basins can add air via the fine bubble diffusion system supplied by four large blowers with automated valves to control the dissolved oxygen concentrations such that biochemical oxygen demand and total inorganic nitrogen removals are optimized.

Secondary Clarifiers
Effluent from two aeration trains flows in a common channel to two circular clarifiers per system (six in total). Eac
h peripheral feel clarifier has a rotating sludge and skimmer arm. Solids settle out of the liquid flow and are pushed to a center sludge hopper for pumping. Liquid overflows the V-notched weirs.

Return Activated Sludge (RAS) Pumping System
The settled sludge in the secondary clarifiers is pumped back to the influent of the aeration system as return activated sludge (RAS) to mix with primary effluent from the intermediate pump station. The organisms in the RAS must be returned to sustain the biological process. Also, the RAS flow returns nitrate for further removal. Each system has three dedicated pumps (nine in total). The return activated sludge and wasted activated sludge pumps are located inside two separate buildings: RAS 1 (Systems A and B) and RAS 2 (System C).

Waste Activated Sludge (WAS) Pumping System
The waste activated sludge (WAS) pumping system controls the activated sludge (biomass) concentrations in the aeration system. A portion of the settled solids from the secondary clarifiers is pumped out of the secondary system to solids processing as WAS.

Scum Pumping System
Scum collected by the skimmer arm of the secondary clarifiers is routed to two scum wells, where it is pumped out of the system to solids processing.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Secondary Treatment Process	50 MGD	
Intermediate Pump Station		
System A Pumps	3 @ 4,200 gpm 60 hp	Per Unit
Valves	4 units	> 18-inch
System B Pumps	3 @ 5,600 gpm 75/60/60 hp	Per Unit
Valves	5 units	> 18-inch
System C Pumps	4 @ 5,600 gpm 75 hp	Per Unit
Valves	5 units	> 18-inch
Gates	5 units	
Flow Equalization System		
Lagoon 1	1 @ 5.8 MG	
Lagoon 2	1 @ 6.2 MG	
Lagoon 3	1 @ 10.3 MG	
Gates	3 units	
Activated Sludge System	2 @ 14.1 MGD 1 @ 15.9 MGD	
Blowers	4 @ 13,426 scfm 700 hp 9.25 psig	Per Unit
System A & B		
Trains	4 @ 1.91 MG	Per Unit
Depth	17.8 ft	
Mixers	4 @ 15 hp	Per Unit
System C		
Trains	2 @ 1.96 MG	Per Unit
Depth	17.8 ft	
Mixers	2 @ 15 hp	Per Unit
Air Panels	142 per train	
Gates	22 per train	
Valve	1 per system	> 18-inch
Valves (air)	6 units	> 18-inch
Secondary Clarifiers		
System A & B	4 @ 700 gpd/ft² 11,310 ft²	Per Unit
System C	2 @ 700 gpd/ft² 13,273 ft²	Per Unit
RAS Pumping System		
RAS 1: Pumps	6 @ 5,600 gpm 60 hp	Per Unit
RAS 2: Pumps	3 @ 5,600 gpm 60 hp	Per Unit
Valves	40 units	> 14-inch
WAS Pumping System		
RAS 1: Pumps	3 @ 450 gpm 7.5 hp	Per Unit
RAS 2: Pumps	2 @ 600 gpm 7.5 hp	Per Unit
Scum Pumping System		
RAS 1	2 @ 400 gpm	Per Unit
RAS 2	2 @ 200 gpm	Per Unit

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Intermediate Pump Stations	4	2	2	3
Flow Equalization System	4	3	3	3
Activated Sludge System	2	4	2	3
Secondary Clarifiers	4	4	3	3
RAS Pumping System	2	3	3	3
WAS Pumping System	2	3	3	3
Scum Pumping System	2	3	3	3

* Ratings as defined in Appendix A; General System Assets

4. Key Issues

Intermediate Pump Stations
EN22031 will install new variable frequency drive technology to replace older clutch drives.

Flow Equalization System
Condition assessments have identified cracks in the bottom and sidewalls of all of the storage lagoons, structures may be sinking due to observation of level changes at top asphalt areas. Operations and Maintenance staff monitor the status of cracks in the lagoons. Project EN19007 will provide odor control for the flow equalization system or will provide the ability to equalize secondary effluent (former comment, unconfirmed if project still exists).

Activated Sludge System
Replacing current Parkson panels to SSI diffuser disks as part of the new project No. EN18025.

Secondary Clarifiers
Units currently under condition assessment. Appears that general rehab may be necessary. Collector drives, torque switches, concrete rehab, etc. Influent gates on Clarifiers 1-4 leak, Clarifier 5 and 6 influent gates need to be upgraded from slide gates to hand wheel gates, Ops currently needs assistance from MM with crane to removed slide gates once installed. Project EN18025 will rehab Clarifiers 2 and 4.

Return Activated Sludge (RAS) Pumping System
No issues require special attention. EN17082 addressed past issues.

Waste Activated Sludge (WAS) Pumping System
No issues require special attention. EN17082 addressed past issues.

Scum Pumping System
No issues require special attention. EN17082 addressed past issues.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Intermediate Pump Stations	1977 1987	Planned 2024
Flow Equalization System	1977 1987 1995 2013	
Activated Sludge System	1977 1987 1997	Planned 2023 and 2024
Secondary Clarifiers	1977 1987	1: Planned 2024 2: Completed 2022 3: Planned 2024 4: Completed 2022 5: Completed 2018 6: Completed 2018
RAS Pumping System	1977 1987 2022	
WAS Pumping System	1977 1987 2022	
Scum Pumping System	1977 1987 2022	

* Appendix B – Condition Assessment Reports

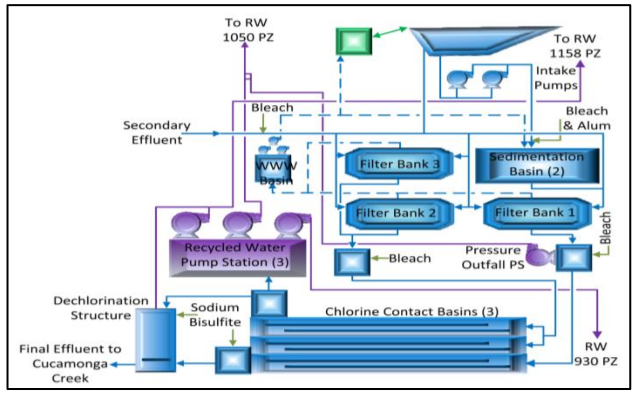
Table 4 Potential Projects

System	Project Name	Project Description
Secondary Clarifiers	RP1 Secondary Clarifier Rehab	Project EN18025 will rehab Clarifiers 2 and 4.
Activated Sludge System	RP-1 Secondary System Rehabilitation No. EN18025	Replacing current Parkson panels to SSI diffuser disks.
Plant Expansion	RP-1 Capacity Expansion EN24001 (liquid) EN24002 (solids)	Expand existing RP-1 liquid and solids treatment capacity starting in 2028.

Asset Management System Summary – RP-1

Tertiary Treatment Process

1. Asset Profile



Intake Pump Station
Secondary effluent is conveyed across the Cucamonga Creek through a 60-inch pipeline, which feeds the tertiary section or can be diverted to Lagoon 3. The intake pumps convey flow from Lagoon 3 to the sedimentation basin.

Aluminum Sulfate (Alum) System
The aluminum sulfate system consists of two large storage tanks, four pumps, piping, and appurtenances. Alum is added to the process at two locations: (1) flash mixer (FM) 1 and (2) flash mixer 2. FM-1 injects chemical into the main feed to the tertiary section. Alum is a coagulant that helps with the removal of suspended materials in the flow path. FM-2 injects alum to into the sedimentation basin influent flow, acting as a coagulant for the suspended material from the waste-wash water basin

Sedimentation Basin
The sedimentation basin can receive tertiary section drainage and filter backwash water from the waste-wash water basin. The flow is mixed with aluminum sulfate at FM-2 and introduced to the mixing tank. The solids in the flow coagulate and settle to the bottom of the tank. The collected solids are pumped to solids processing, while the overflowing liquid is sent to the filters.

Chlorination System
Three chemical tanks hold 12.5 percent bleach. Two pumps draw from the tanks to feed an injection point ahead of the filters at FM-1. Two additional pumps supply chlorine to a looped pipe system from the tanks to the filter effluent structures (OES and NES). The effluent structures each have a duty and standby peristaltic dosing pump. The duty pumps inject bleach through a mixer into the process streams. Chlorine residual is measured throughout the tertiary process to control the chlorine dose.

Filters
There are three filter banks, consisting of a total of 26 down-flow filters. The flow travels through layers of anthracite, sand, and gravel. The filters are regularly backwashed to remove the solids that have been filtered from the secondary effluent. Backwash water is sent to the waste-wash water basin and pumped back into the lagoons or sedimentation basin.

Waste-Wash Water (WWW) Basin
The waste-wash water (WWW) basin collects drainage from the entire tertiary section of RP-1 and also collects filter backwash and leakage from the three filter banks. The collected water is pumped by three pumps to: (1) equalization lagoons or (2) the sedimentation basin.

Filter Effluent Structures
Flow from the filters enters OES or NES. The structures are equipped with chlorine analyzers and peristaltic bleach pumps to maintain the chlorine residual set point at the end of each effluent structure. Chlorinated flow is conveyed to the chlorine contact basins.

Chlorine Contact Basin (CCB)
The chlorine contact basins (CCB) have a serpentine flow path that allows for the injected chlorine to gain contact time with the treated water to meet permit requirements. The contact basins are covered and have continuous monitoring of chlorine residual. Flow from all three contact basins merge into a common effluent channel and flow to the CCB splitter box.

Effluent Splitter Box
Flow entering the CCB splitter box is directed to the dechlorination structure, recycled water wet well, or the pressure outfall pipeline. Flow is controlled by gates.

Dechlorination System
Flow entering the dechlorination structures is dosed with sodium bisulfite (SBS) and travels through a serpentine flow path to allow for the SBS to neutralize any chlorine residual before flowing into Cucamonga Creek. SBS is stored in two large chemical tanks and is metered into the system via six chemical metering pumps.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Tertiary Treatment Process	44 MGD	
Intake Pump Station	2 @ 14,000 gpm 60 hp	Per Unit
Alum System Tanks Pumps	 2 @ 20,000 gallons 2 @ 20.25 gph 1 @ 32.20 gph 1 @ 58.50 gph	
Sedimentation Basin Total Weir Length Total Settling Tube Area Chemical Mixer Traveling Bridge Pump	 800 ft 7,600 ft^2 8 @ 3 hp 1 @ 1.5 hp 2 @ 130 gpm	
Filters Bank No.1 Bank No.2 & 3 Filter Loading Rate Valves	 8 @ 299 ft^2 18 @ 299 ft^2 5 gpm/ft^2 118 units	 Per Unit Per Unit 12 - 42-inch
Waste-Wash-Water Basin Pumps Valve	 3 @ 2,100 gpm 2 units	 Per Unit > 18-inch
Filter Effluent Structures Gate Valves	 4 units 2 unit	 > 18-inch
Chlorination System Tanks ME-18 Pumps OES Pumps NES Pumps Mixers	 3 @ 10,300 gal 2 @ 317 gph 2 @ 205 gph 2 @ 205 gph 3 water champs	 Per Unit Per Unit Per Unit Per Unit
Chlorine Contact Basins Gates Valves	3 @ 1.3 MG 6 units 1 unit	Per Unit >18-inch
Effluent Splitter Box		
Gates	3 units	
Dechlorination System Tanks Pumps	 2 @ 12,500 gal 4 @ 9-90 gph 2 @ 2-20 gph	 Per Unit Per Unit Per Unit

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Intake Pump Station	4	3	3	3
Alum System	2	2	3	3
Sedimentation Basin	4	4	3	4
Chlorination System	4	3	4	4
Filters	4	3	3	3
Waste-Wash Water Basin	1	2	2	3
Filter Effluent Structures	4	4	3	4
Chlorine Contact Basins	3	3	3	3
Effluent Splitter Box	4	5	3	3
Dechlorination System	4	3	3	4

* Ratings as defined in Appendix A; General System Assets

4. Key Issues

Intake Pump Station
Exterior deterioration to both pumps. Seal water lines broken. One pump is O/S will not run. One pump will run if needed to pull from Tp1 influent line only. Available pump has not ran in years.

Aluminum Sulfate (Alum) System
Four new Blue White M4 pumps installed approx. three years ago. Have found ourselves with two of the four O/S due to pump tubing replacement or leaks.

Sedimentation Basin
Basin has received new parts over the past year. New drive and sweep motors, new shaft bearings, new flocculator gear box bearings, and new cable/counterweight for bridge reel. Could still use control through SCADA, new flocculator motor and gear boxes, new bridge sludge pumps, new scum well level transmitter, and new scum transfer pumps.

Chlorination System
Main CL2 pumps are old and receive constant leaks at diaphragms requiring rebuild. Recurring belt adjustment during monthly service. Bleach recirculation pumps continuously leaking causing damage to pump and/or motor. Bleach tanks themselves last 1-2 years before leaks begin to occur. Main bleach tank discharge header in need of replacement due to old, bridle, and bowed CPVC piping. New FM-1 bleach injection system has seen problems when RW carrier water pressure increases above pump discharge pressure. Also, Fm1 bleach injection line check vales not operating properly allowing carrier water to back feed into CL2 lines.

Filters
All 26 filter drain valves and filters #1-8 surface wash valves replaced approx. 4 years ago. All filter inlet valves leak and need replacement. Filter surface wash valves for remainder filter's function but could use replacement. Not all current surface wash valves are the same. Replacement would provide uniformity for both inlet and surface wash valves. Change filter level indicators from bubbler system to level transmitters. Approx. 11 filters are currently on level transmitter. Remainder 15 are on bubbler system. Perform condition assessment of Filter piping within galleries due to recent leaks at filter #4 inlet line.

Waste-Wash Water (WWW) Basin
Received new MCC, pumps, piping configuration, sump pump, and discharge valves within last 3 years. No issues to report with new equipment. Level transmitters replaced by E&I within last 4 years.

Effluent Structures
OES structurally can use repairs, replace damaged or deteriorated gates. Install influent isolation gate at front of structure. Replace deformed red wood boards with new covers. NES- Complete condition assessment. Will probably find structural repairs needed. Replace current structure covers.

Chlorine Contact Basins (CCB)
Condition assessment and cleaning performed approx. 7 years ago. Could use new flow meters with controllers and installation equipment and brackets. This will provide uniform equipment and secure installation. Current installation in poor condition and differs on each CCB. Also, each flow meter is different from each other.

Effluent Splitter Box
Complete condition assessment for structural repairs. New discharge gates needed due to deterioration. New analyzer sample piping needed. Coliform sample cabinet installation would assist with keeping sample point clean.

Dechlorination System
Complete condition assessment for structural repairs. Current paddle mixer is old and could use replacement. Two out of six new SBS pumps installed. Replace remainder SBS pumps. Two new Blue white M4 peristaltic pumps installed. Newer analyzer and equipment, new bleach cleaning cycle pumps and equipment.

Table 3 History of Select Assets

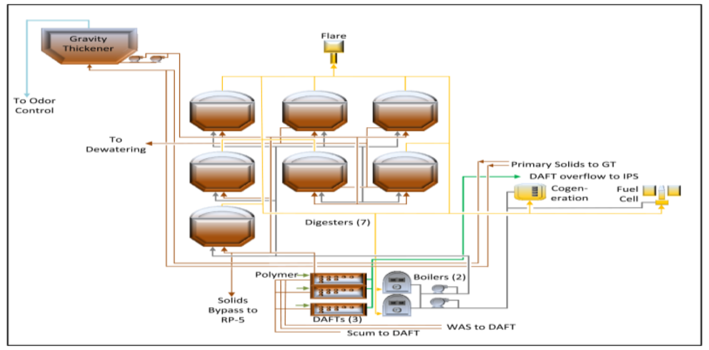
System	Capital Improvement Project Activity	Condition Assessment Report
Intake Pump Station	1977	
Alum System	1977 1998	
Sedimentation Basin	1977 1998	
Chlorination System	1977 2004	
Filters	1977 1982 1987	Planned 2029
Waste-Wash Water Basin	1977 1987	
Filter Effluent Structures	1977 1987	Planned 2025
Chlorine Contact Basins	1997	Planned 2027
Effluent Splitter Box	2002	
Dechlorination System	1992 2011	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
Filters	RP-1 Tertiary Bypass Valve Automation	RP-1 Tertiary Bypass valve Upgrade/automation. The project may include: 1. Install new communication wires 2. May require new conduit 3. Incorporate into SCADA migration PCNs or write a stand alone PCN (simple manual control setpoint between 0-100 percent open)
Sedimentation Basin	RP-1 Tertiary Asset Management Phase 1 No. ENxy43	<u>RP-1 Sedimentation Basin Sludge Pump Project</u> scope will include obtaining a consultant to evaluate existing system and provide recommendations on pumps to handle the longer run time of the traveling bridge while still providing redundancy, install a flowmeter on the discharge line, evaluate the check valves and evaluate the electrical system. <u>RP-1 Tertiary Filter effluent valve #21 Tee</u> Scope of work includes: 1. Confirm size and bolt pattern 2. Procure replacement valve <u>RP-1 Tertiary Filter Influent #4 Tee</u> Scope of work includes: 1. Confirm size and bolt pattern on all three sides of the Tee 2. Procure replacement 3. Replace the Tee and test the system <u>RP-1 SBS</u> Deficient items that need replacement include: 1. Replace MCC- existing MCC has met life expectancy. Original installation with no known enhancements since installation. 2. Replace lighting panel 3. Remove existing blue and white pumps on north side of the wall and associated electrical/piping- return to maintenance. 4. Replace and relocate existing four diaphragm chemical dosing pumps with four peristaltic pumps. 5. Replace suction/discharge piping inside the pump station. 6. Demo Diaphragm pump pedestals. 7. Recoat the pump station flooring. 8. Replace discharge piping from the pump station to the discharge locations at the Dechlorination Basin. 9. Replace heat tape and insulation on exterior discharge piping 10. Replace backpressure regulators on the discharge piping outside the structure to the dechlorination basin. 11. Replace/relocate existing eye wash station with eyewash and shower combination. 12. Replace lighting to enhance efficiency. 13. Replace building exhaust fan. 14. Replace Scada Cabinet

Asset Management System Summary – RP-1
Solids Treatment Process
1. Asset Profile



Gravity Thickener System
Solids collected from the primary clarifiers are pumped to the gravity thickener (GT) and mixed with sweetener water supplied by the utility water system. Solids are allowed to settle to the bottom of the GT. Solids are increased from 1 percent total solids to 2 to 4 percent total solids. The thickened solids are pumped to the digestion system. The liquid overflow is conveyed back to the RP-1 headworks splitter box.

Dissolved Air Flotation Thickener (DAFT) System
The three DAFTs receive solids from the scum collection systems of the primary and secondary clarifiers and also receive waste activated sludge from the secondary system. Solids entering the DAFTs are mixed with recycled flow that has been pressurized with compressed air from two large compressors and dosed with polymer. Solids float to the top, where they are skimmed off and pumped to the digestion system. Solids are thickened from ~1 percent to 4 percent total solids through this process. The liquid underflow of the DAFT flows to the system C splitter box. A solids bypass allows for the diversion of solids to the regional collection system, which flows to RP-5.

Digestion System
Seven digesters receive thickened sludge. Digesters 1 and 2 have floating domes, while Digesters 3, 4, 5, 6, and 7 have fixed covers. The hot water system provides heat, and the sludge recirculation system transfers heat to maintain temperatures from 97 to 128 degrees Fahrenheit. Each recirculation system is equipped with a grinder. Gas-mixing systems mix the contents of the digesters. Gas piping connected to the top of each digester allows the produced gas to enter the gas conveyance system. Several pressure/vacuum relief valves and J-tube safety blow-offs are on each digester to prevent over and under pressurization.

Sludge Transfer System
To allow for phased digestion, RP-1 is equipped with several pump stations and automated valves to transfer sludge throughout the digestion system. The transfer system is designed to offer the greatest flexibility of transferring sludge to each of the seven digesters. Valves are operated from a centralized compressed air system.

Hot Water System
The hot water system consists of two loops: (1) primary (heating) and (2) secondary (delivery). The primary loop collects heat from heat exchangers at the boilers and the fuel cell (note: fuel cell owned by private firm). The secondary loop pulls heated water from the primary loop and sends it to the heat exchangers at each digester. Two boilers are fueled by digester or natural gas, or both. The cogeneration heat exchangers collect heat from the water jacket and the exhaust of the cogeneration engines when the engines are in service. The fuel cell has a heat exchanger on the exhaust stack that collects waste heat.

Gas Conveyance and Waste Gas System
Gas collected from the digestion system enters the gas loop, which can deliver low-pressure gas to the compressors for use in the boiler or fuel cell or to the flare. The gas loop has several J-tubes to prevent over-pressurization. Iron sponges are used to remove hydrogen sulfide from the digester gas. Digesters 1 and 2 have a waste gas line that can deliver low-methane content gas directly to the flare.

2. Capacity Profile
Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Solids Treatment Process	60 MGD	
GT System		
Tank	1 @ 299 gal/ft^2/day 3,848 ft^2	Per Unit
Drive Pumps	1 @ 1.0 hp 2 @ 150 gpm 15 hp	Per Unit
DAFT System		
Tanks	3 @ 85 gal/ft^2/day 2,100 ft^2	Per Unit
Recirculation Pumps	3 @ 1,260 gpm	Per Unit
Sludge Pumps	6 @ 200 gpm	Per Unit
Polymer Blending Units	4 @ 8.0 gph	Per Unit
Pressurization Tanks	3 @ 2,000 gal.	Per Unit
Compressors	2 @ 40 hp	Per Unit
Digester System		
Digester No.1 & 2	2 @ 112,122 ft^3	Per Unit
Digester No.3 & 4	2 @ 99,500 ft^3	Per Unit
Digester No.5	1 @ 172,995 ft^3	
Digester No.6 & 7	2 @ 224,332 ft^3	Per Unit
Recirc. Pumps	5 @ 600 gpm 30 hp 2 @ 500 gpm 30 hp	Per Unit Per Unit
Heat Exchangers		
Tube in Tube	1 @ 6.0 MMBTU/hr	
Spiral	6 @ 1.5 MMBTU/hr	Per Unit
Gas Mixers	4 @ 504 SCFM 30 hp 3 @ 3,839 SCFM 70 hp	Per Unit Per Unit
Sludge Transfer System		
Transfer A Pumps	2 @ 400 gpm	Per Unit
Transfer B Pumps	6 @ 400 gpm	Per Unit
Hot Water System		
Boiler	2 @ 10.5 MMBTU/hr	Per Unit
Fuel Cell	1 @ 4.4 MMBTU/hr	
Primary Loop Pumps	2 @ 25 hp 900 gpm	Per Unit
Secondary Loop Pumps	3 @ 15 hp 550 gpm	Per Unit
Gas Conveyance System		
Flare	1 @ 40,000 SCFH	
Iron Sponges	2 @ 210 ft^3 1 @ 546 ft^3 1 @ 350 ft^3	Per Unit

3. Asset Ratings
Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Gravity Thickener System	3	5	5	5
DAFT System	4	4	2	3
Digester System	4	4	3	3
Sludge Transfer System	2	3	5	3
Hot Water System	3	4	4	3
Gas Conveyance System	4	3	3	3

* Ratings as defined in Appendix A; General System Assets

4. Key Issues
Gravity Thickeners System
Currently, the gravity thickener is heavily loaded, and regular upsets require the diversion of primary solids to the DAFT system or the bypass system. Project EN22044 will provide a Skid-mounted RDT System that will optimize the current thickening system. Ultimately, Project EN22044 will construct a new sludge thickening building with nine (9) Rotary Drum Thickeners (RDT's) to thicken primary and secondary sludge and eliminate the gravity thickener system.

Dissolved Air Flotation Thickeners (DAFT) System
Project EN22044 will construct a new sludge thickening building with nine (9) RDT's and eliminate DAFT 3. DAFT's 1 & 2 will be rehabilitated and operate duty/standby to thicken primary and secondary scum.

Digester System
Maintenance has an established regimen to clean and rehab one digester a year to remove collected inorganics. Digesters 6 and 7 are currently being cleaned and rehabilitated under project EN17042. Project EN22044 will construct three (3) acid phase digesters with 45 ft diameter and 32 ft max side water depth. A potential engineering project will upgrade the mixing systems within 5-10 years.

Sludge Transfer System
The sludge transfer system was designed to be robust. However, during phased digester with an acid phase digester online, there is a single point of failure on the main transfer pump from the first/acid phase to the second phase digesters. Project EN17082 installed two grinders to mitigate transfer pump failure issues during phased digestion.

Hot Water System
Project EN20065 replaced approx. 700 L.F. of the hot water supply and return pipelines due to heavy corrosion. To meet the additional heating demand from the three (3) future acid phase digesters, Project EN22044 will install a third boiler. A potential engineering project will upgrade the digester gas boosters with VFDs, replace the primary and secondary hot water pumps, and upgrade the digester heat exchangers in 5-10 years.

Gas Conveyance System
Project EN18006 is replacing the existing flare system and piping system with three new flares and digester gas holding tank to ensure adequate control of the digester gas pressures and to meet the strict emission requirements of the South Coast Air Quality Management District. A potential project is needed for a condition assessment on the gas conveyance piping and valves.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Gravity Thickener System	1987	
DAFT System	1977 1987	Planned 2025 and 2029
Digester System	1975 1977 1985 1982 1992 1999 2008	1: Planned 2024 2: Complete 2022 3: Planned 2020 4: Planned 2026 5: Planned 2025 6: Planned 2026 7: Planned 2017
Sludge Transfer System	2008	
Hot Water System	1977 1985 2012	
Gas Conveyance System	1975 1985 2008	

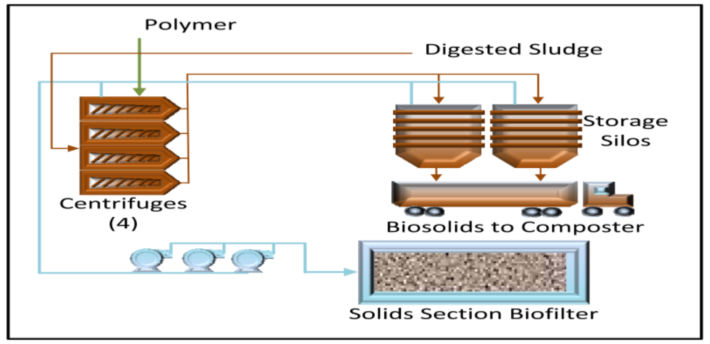
* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
Gravity Thickener System and DAFT System	RP-1 Thickening Building and Acid Phase Digester No. EN22044	Project to upgrade the sludge thickening processes for primary and secondary sludge.
Digester System	Digester Cleaning and Rehab	The Agency has established an Agency-wide digester annual cleaning and rehabilitation regimen to remove solids and inorganics collected at the bottom of the digesters, replace valves, install new seals, and maintain critical pieces of equipment. Include in Agency-wide TYCIP.
Digester System	Flame Arrestor Bypass	Install bypass piping around the existing flame arrestors to allow for proper maintenance.
Gas Conveyance System	RP-1 Flare Improvements	RP-1 Flare improvements and gas system upgrades.
Sludge Transfer System	RP-1 Solids Grinders	Install grinders in the digester area to reduce the frequency of pump clogging and amount of inorganic material settling in the digesters.
Hot Water Loop	RP-1 Thickening Building and Acid Phase Digester No. EN22044	RP-1 Hot Water Loop Pumps and Gas Booster Replacement. The project may include: 1. Modification to existing piping. 2. Modification to electrical equipment. 3. Modifications to footings. 4. Replacement of five (5) pumps

		5. Replacement of two (2) gas boosters and add VFD motors.
Digester UW Line	RP-1 Utility Water Piping Asset Management Phase 1 ENXY42	This project will replace all UW piping in the digester area as generally highlighted in the "Project Request Information" tab ranging from one-inch pipe to 8-inch piping. Sections of UW piping around Digester 6 and upcoming Digester 7 project do not need to be replaced. Abandon below ground piping if possible and utilize above grade racks. Replace piping with pipe material able to handle UW with a chlorine residual of ~ 4mg/L. Operations recommend 316 SS or comparable material. The exact quantity of the pipe replacement is undetermined as this project will need to research and plan for replacement. In addition, asset management will conduct a corrosion condition assessment to help identify the most suitable piping for the Utility Water and estimate the quantity of piping that will require replacement. The condition assessment will take place along with the EN22021 project so that consultants can access the pipeline and perform testing. Recommendations and findings will be debriefed with engineering, operations, maintenance, and asset management.
Storm Drain Piping	RP-1 Thickening Building and Acid Phase Digester No. EN22044	RP-1 Storm Drain Piping Condition Assessment and Replacement. The project may include: 1. Perform condition assessment of the entire storm water system. 2. Repair and/or replace any section of pipe that is damaged.

Asset Management System Summary – RP-1
Dewatering Treatment Process
1. Asset Profile



Sludge Grinding System
Two inline grinders ensure that large solid objects in the sludge flow are broken up into small pieces to limit the possibility of large objects causing obstructions in downstream piping or equipment.

Sludge Feed Pump System
Four rotary lobe pumps pull sludge from the grinders and pumps flow to the influent of the centrifuges. The sludge pumps are variable speed with flow meters, instrumentation, and controls. A series of cross-connects in the pump discharge piping allows for sludge pumps to feed different centrifuges.

Polymer Blending System
Totes of polymer are transferred to a large day tank via two rotary lobe transfer pumps. Four polymer blending units meter polymer and dilution water to a mixing chamber. The discharge of the polymer blending unit is conveyed through a network of pipes and cross connection valves to three separate dosing points in the sludge piping.

Centrifuge System
The sludge flow mixed with polymer enters the feed tube of the centrifuge and discharges into a spinning bowl. The centrifugal force of the spinning bowl forces the heavier solids to the edge of the bowl and the centrate to rest on top of the solids. A scroll, spinning slightly faster than the bowl, scrapes the solids around the edge of the bowl to one end of the centrifuge, up a beach, and into the discharge shoot to the conveyor. The bowl has dam plates to maintain a depth of centrate until it overflows at the other end to the centrate wet well.

Conveyor System
Two separate screw conveyor systems, configured in parallel, collect dewatered solids (cake) from each centrifuge. Solids are diverted to each system via a diverter gate and then through a series of shaftless screws until solids are discharged into the storage silos.

Storage Silo System
Solids from the conveyor system are dropped into two separate storage silos. The silos hold collected cake until a loading sequence is initiated, and solids are dropped through a series of gates and discharge screws into a truck trailer for hauling to an offsite facility.

Centrate and Drainage Pump System
Centrate collected from the centrifuge operation is conveyed to the centrate pump station where it is pumped to the Non-Reclaimable Wastewater System. The centrate pumps are variable speed to maintain a wet well level. Process flows generated during centrifuge startup and shutdown are conveyed to the drainage pump station, where they are pumped back into the RP-1 process by constant speed drainage pumps.

Anti-Struvite System
Five pumps pull chemical from a storage tote and inject into the centrate pipes of each centrifuge and the centrate wet well. The chemical inhibits Struvite formation that forms naturally in centrate and adheres to walls of downstream piping.

Odor Control System
Three blowers pull foul air from the gravity thickener, miscellaneous sumps, and either the belt press or centrifuge buildings, forcing the air through a bed of carbon-rich media to allow for the biological consumption of hydrogen sulfide and other compounds.

2. Capacity Profile
Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Dewatering Treatment Process	60 MGD	
Sludge Grinding System	2 @ 10 hp	Per Unit
Sludge Feed System Pump	4 @ 360 gpm	Per Unit
Polymer System Blending System	4 @ 5 to 30 gph	Per Unit
Centrifuge System Centrifuge	4 @ 360 gpm	Per Unit
Conveyor System	2 trains w/ 5 conveyors ea. from 7.5 to 30 hp	
Storage Silo System	2 @ 5,636 ft^3	Per Unit
Centrate Pump System Drainage Pump System	3 @ 450 gpm 2 @ 450 gpm	Per Unit Per Unit
Anti-Struvite System Pump	4 @ 4.0 gpm 1 @ 8 gpm	Per Unit
Odor Control System Blower Media Depth Valves	1 @ 4,600 scfm 2 @ 13,700 scfm 5 ft 10 units	Per Unit > 18-inch

3. Asset Ratings
Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Sludge Grinding System	1	2	2	2
Sludge Feed Pump System	3	3	2	3
Polymer Blending System	4	3	3	4
Centrifuge System	3	3	3	3
Conveyor System	3	3	4	3
Storage Silo System	1	3	3	3
Centrate and Drainage Pump System	5	3	4	4
Anti-Struvite System	2	3	4	3
Odor Control System	3	3	3	4

* Ratings as defined in Appendix A; General System Assets

4. Key Issues

Sludge Grinding System
No issues require special attention.

Sludge Feed Pump System
No issues require special attention.

Polymer Blending System
The current polymer blending units have thermal flow sensors that frequently need calibration causing disruptions in production. The polymer units also have issues with the solenoid valves for carrier water affecting the dilution factor on the polymer.

Centrifuge System
A current maintenance project is rehabilitating each centrifuge. Centrifuge 4 was recently rehabilitated and centrifuge 1 is out for rehabilitation now.

Conveyor System
No issues require special attention.

Storage Silo System
Level sensing equipment does not operate reliability. A potential project should replace level sensing equipment in the storage silos.

Centrate Drainage Pump System
Project EN21044 replaced the drainage and centrate valves with motor-operated valves (MOVs) and integrated in the plant SCADA system.

Anti-Struvite System
No issues require special attention.

Odor Control System
Condensate drains on the blower suction lines plug with grit and sludge accumulation. The drains are inaccessible and a potential project should consider alternatives to clearing clogged blower suction drain lines

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Sludge Grinding System	2013	
Sludge Feed Pump System	2013	
Polymer Blending System	2013	
Centrifuge System	2013	
Conveyor System	2013	
Storage Silo System	2013	
Centrate and Drainage Pump System	2013	
Anti-Struvite System	2013	
Odor Control System	2003	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
Centrate Treatment	RP-1 Centrate Treatment No. EnXY35	RP-1 Centrate Treatment. The project may include: 1. Design and construction of a brand new centrate treatment structure and equipment. Type of side stream treatment to be determined by design engineer. 2. Modifications to centrate conveyance system. .
Dewatering Silos Levelers Relocation	RP-1 Dewatering Silos Levelers Relocation No. EnXY30	RP-1 Dewatering Silos Levelers Relocation. The project may include: 1. Consult with engineering firm for extent of modification or alternative technology for leveling biosolids in silos. 2. Conduct condition assessment of silos and pertinent equipment. 3. Take each silo offline for an extended period to perform modifications. 4. Schedule biosolids hauling during the weekend to IERCF as needed. Refer to drawing Number D6610 for silos.
Centrate Treatment	RP-1 Centrate Line Improvements	Centrate Line Improvements
Centrate Treatment	RP-1 Dewatering Centrate Pumps	Dewatering Centrate Pump Improvement

Asset Management System Summary – RP-1
Auxiliary Systems
1. Asset Profile

RP-1 Plant Drain
The RP-1 plant drain collects and pumps surface runoff from storm events, wash-down water, and drains some of the treatment plants tanks and processes in the preliminary, primary, secondary, solids, and dewatering sections. The drain system receives gravity flows to a wet well, where it is pumped to the System C splitter box.

TP-1 Plant Drain
The TP-1 plant drain collects and pumps surface runoff from storm events, wash-down water, and drains TP-1 tanks and processes in the tertiary section. The drain system receives gravity flows to a wet well, where it is pumped to the waste-wash water basin. A second pump station (West Wind Storm Water Pump Station) collects surface runoff and pumps water to the main TP-1 Plant Drain wet well.

Electrical System
The electrical energy to power the treatment facility is obtained from the local electrical grid (SCE) and onsite energy generation (solar, fuel cell, and emergency generators). The solar and fuel cell assets are owned and operated by private firms as part of power purchase agreements. The electrical feed from the grid is composed of a 12 kV feeder to the RP-1 Power Reliability Building, where transformers and switchgear are located to distribute electrical energy throughout the facility. A single line diagram of the RP-1 electrical system is shown in Appendix B.

Diesel emergency generators are used in the event of a power failure. Three generators are located in the Energy Recovery Building and supply power to the preliminary, primary, secondary, solids and dewatering sections. One generator supplies power to the tertiary section. A final generator supplies power to the Dechlorination System.

An extensive lighting system is needed to illuminate the facility during dark hours. Most lighting fixtures are equipped with light sensors to turn off when sufficient lighting is provided from the sun. Lighting units are inside each of the process buildings, on equipment walls, and along the roadways for safety.

Utility Water System
Utility water is used for cleaning, supplying pump seal water, cooling, dilution, flushing of clogged pipes, irrigation, and other inner plant uses. The system can be supplied by the 1050-foot pressure zone pump station or the pressure outfall (PO) pump station. The PO pump station is operated on occasion during shutdowns and other activities to supply process water to the treatment plant. The utility water system piping consists of several isolation valves and point-of-use connections.

Potable Water System
Potable water is used throughout the plant for restrooms, cooling, odor scrubber dilution water, fire suppression, and more. The system is supplied from a service on Philadelphia Street and another service on Walnut Avenue from the city of Ontario. The system has several backflow devices to protect the drinking water system.

Instrumentation and Control System
An extensive array of instruments is used to monitor and control the processes at RP-1. Nearly all of the processes at the plant are observed and controlled from a centralized control system known as the Supervisory Control and Data Acquisition or SCADA system. Control wiring and local panels are provided at individual pieces of equipment, and control wiring transmits data to three main control terminals at (1) Main Control Building, (2) Dewatering Building, and (3) the Tertiary Control Building.

Yard Piping
A substantial network of pipes is used to convey flows between unit processes. The material, sizes, and service conditions of these pipes vary widely.

2. Capacity Profile
Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
RP-1 Plant Drain	2 @ 1,585 gpm 40 hp	
TP-1 Plant Drain	2 @ 1,000 gpm 15 hp	
Electrical System Utility Voltage Transformers Switchgear Distribution RP-1 Generator TP-1 Generator Dechlorination Generator Mounted Lighting	 12 kV 12 kV to 480 V 2 @ 12 kV to 4,160 V 1 @ 12 kV 22 @ 480 V 1 @ 4160 V 3 @ 1,250 kW 1,801 Bhp 1 @ 670 kW 896 Bhp 1 @ 30 kW > 145 units	 MCCs MCCs
Utility Water System Pipelines Pressure Outfall Pump Station	 Various sizes 3 @ 800 gpm 2 @ 1500 gpm	
Potable Water System Backflow Devices	 31 units	
Instrumentation and Control System HMI Workstations PLC I/O Hub Radio Transmitter	 6 Units 16 Units 1 unit	

3. Asset Ratings
Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
RP-1 Plant Drain	3	3	3	3
TP-1 Plant Drain	4	4	4	4
Electrical System	3	3	3	3
Utility Water System	4	3	4	3
Potable Water System	3	4	4	3
Instrumentation and Control System	4	3	3	3
Yard Piping	4	3	3	3

* Ratings as defined in Appendix A; General System Assets

4. Key Issues
RP-1 Plant Drain
Standing water within the plant does result in vector issues.

TP-1 Plant Drain
The West Wind Storm Water pumps Station has experienced pump failures. Intense rainfall events have overwhelmed the low capacity pumps station. Several factors can be attributed to the low capacity; inadequate pump sizing, small pump discharge piping and obstructions that clog pumps/piping limiting flow.

Electrical System
Project EN13048 will address the installation of a second 12 kV feeder from the power reliability building to TP-1. Additional information for this project can be found in the asset summary section for recycled water.

The System C main control computer (MCC) panel is located outdoors. Maintenance is planning a project to rehab and provide protection for the MCC.

The Plant 3 primary MCC is aging and no longer supported by the manufacturer. Project EN14019 will rehab and replace the MCC.

Lighting rehab and improvements are being evaluated and implemented by the Engineering Department.

Recent investigation into the backup generator switchgear has indicated the controls are near the end of their useful life. A potential project is needed to replace 20 year old PLC.

Utility Water System
A potential maintenance project will rehab deteriorated portions of this system. Recent condition assessments of the main utility water feed have indicated active corrosion occurring in piping supplying most of the treatment plant. Several of the valves meant for isolation of the utility water system do not hold.

The pressure outfall pump station is minimally maintained since the 1050 RW pumps are used to supply utility water throughout RP-1.

Potable Water System
A potential maintenance project will rehab deteriorated portions of this system. Several leaks have been observed and fixed in the potable water system.

Instrumentation and Control System
The control system will be updated in 2017 as part of Project EN13016.

Yard Piping
A 2011 condition assessment of the secondary effluent piping showed it to be in good condition. Observations suggest that piping around preliminary, primary, and solids processes that do not run full may have significant deterioration. Condition assessment planned for 2014 will determine the scope of a potential maintenance project to rehab this system.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
RP-1 Plant Drain	1999	
TP-1 Plant Drain	2001	
Electrical System	1994	
Lighting	1977	
Utility Water System	1977	
Potable Water System	1977	
Instrumentation and Controls	1977	
Yard Piping	1977	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
HVAC	RP-1 Operations Bldg HVAC System Upgrades No. FMXXX2	The RP-1 Operations Building chiller has been in service for nearly 15 and engineered life cycle of commercial HVAC equipment is 15 years depending on run hours. It has been broken-down several times and getting expensive to maintain. The refrigerant that the current chiller uses is being phased out due to environmental standards and will not be available for repairs within 1-2 years. The current controls for the HVAC system in the Operations building are obsolete and parts are no longer available to repair system. HVAC control system needs to be update to Distech N4 Eclipse. Replacing the obsolete equipment will insure reliability and efficiency among the HVAC system. .
Plant Air	RP-1 Plant Air Expansion Tank Replacement No. ENXY25	RP-1 Plant Air Expansion Tank Replacement. This project may include: 1. Condition assessment of existing air expansion tanks. 2. Remove, dispose, and replace existing tanks; or,

		3. Recondition existing tanks to extend life of use

End of System Summary

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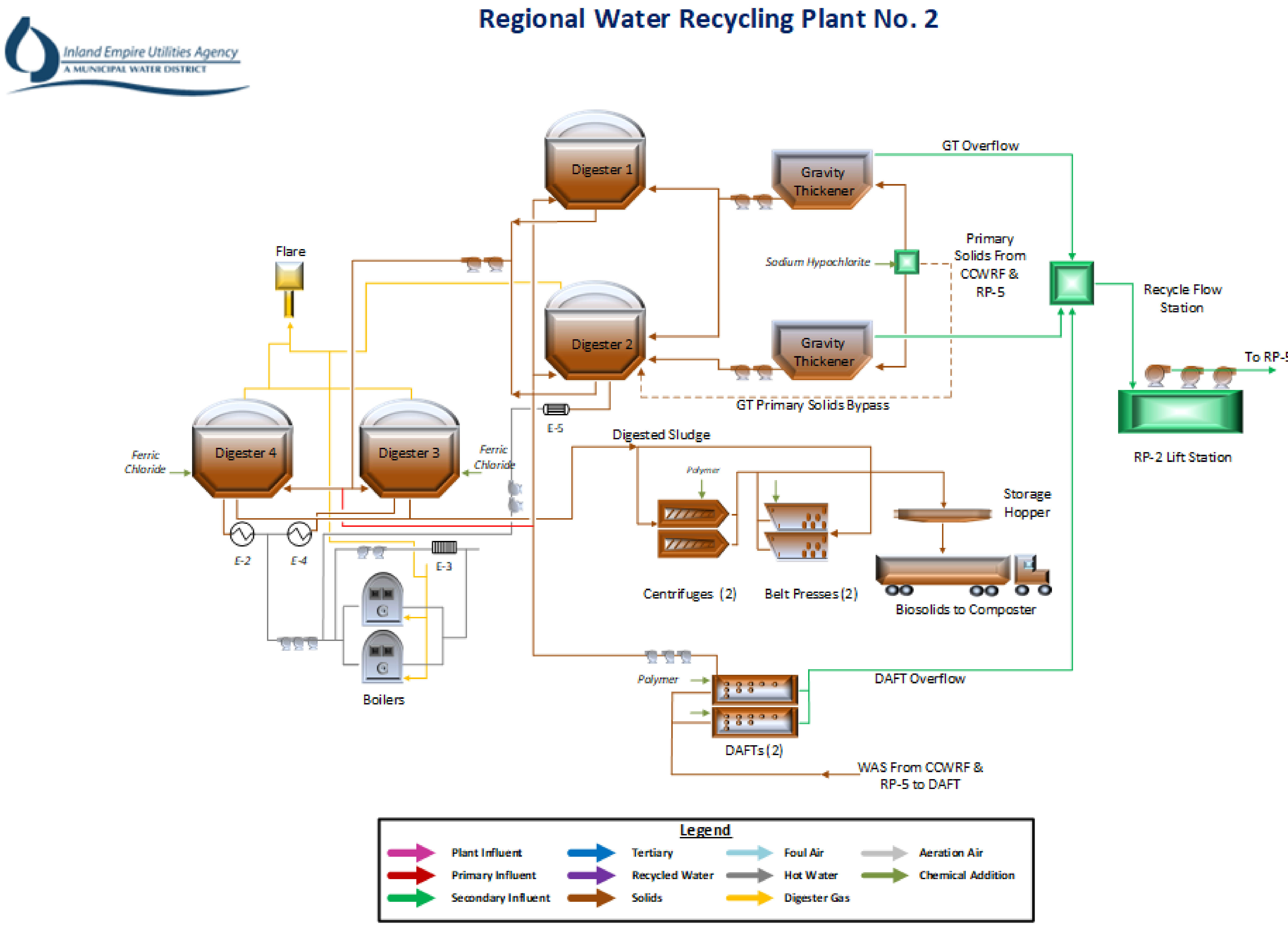

Figure 7-3: Regional Water Recycling Plant No. 2 (RP-2) – Schematic

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Table 7-3: Regional Water Recycling Plant No.2 – Project Summary

#	Project Number[1]	Project Name	Project Description	Fund[2]	Project Type[3]	Fiscal Year Budget (Dollars)										
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Ten-Year Total
1	EN26025	RP-2 Preliminary Design Report for Decommissioning (Brian Wilson)	The Agency will retain a consultant to provide a preliminary design report for the decommissioning the RP2 facility safely and without disruption to the two facilities currently supplying solids to the RP2 plane. These facilities are the RP5 and Carbon Canyon Water Recycling Facilities	RO	OM	0	0	0	0	0	600,000	1,100,000	1,500,000	1,500,000	1,500,000	6,200,000
2						-	-	-	-	-	-	-	-	-	-	-

(1) Project Number – from Ten-Year Capital Improvement Project; Final Capital Project List 10-17-2014

(2) Project Fund – Administrative Services (GG), Non-Reclaimed Water (NC), Regional Composting Authority (RM), Ground Water Recharge (RW), Recycled Water (WC), Regional Capital (RC), Regional O&M (RO), or Water Fund (WW)

(3) Project Type – Capital Construction Project (CC), Capital Major Equipment Project (EQ), Operations & Maintenance Project (OM), Reimbursable Project (RE), or Capital Replacement Project (RP)

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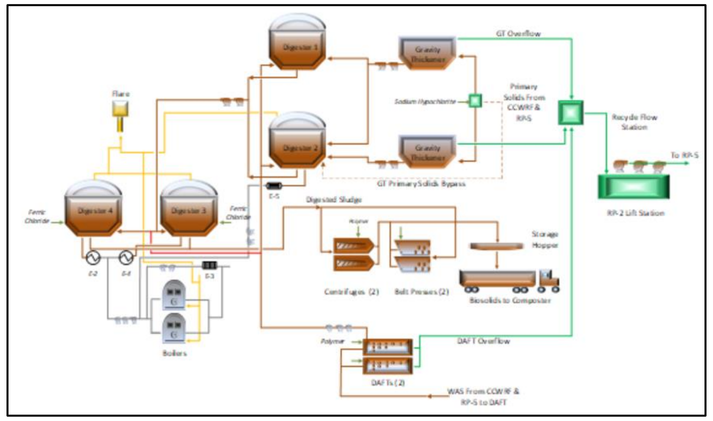
Asset Management System Summary – RP-2

Solids Treatment Process

1. Asset Profile



Gravity Thickener (GT) System START HERE
The gravity thickener (GT) distribution box receives primary clarifier sludge and scum from Carbon Canyon Water Recycling Facility (CCWRF) and RP-5 and distributes flow to GT #1 or #2 or both. Sodium hypochlorite may be introduced to the GT if needed from a 1600-gallon storage tank onsite. Solids are allowed to settle at the bottom of the GT. Solids are increased from ~1 percent total solids (TS) to ~4 percent TS. The thickened solids are then pumped to the digestion system.

Dissolved Air Flotation Thickener (DAFT) System
The DAFT system consists of two circular tanks. Waste activated sludge from the secondary system from CCWRF and RP-5 enters the DAFT and is mixed with recycled flow that has been pressurized with compressed air and dosed with polymer. Solids float to the top, where they are skimmed off and pumped to the digestion system. Solids are thickened from 1 percent TS to 4 percent TS. The overflow of the DAFT flows to the recycle flow station. Flow from the recycle flow station flows to the RP-2 lift station, where it is returned to the RP-5 headworks.

Digestion System
The digestion system consists of three anaerobic digesters and one aerobic digester. Digester 1 is operated only when capacity is limited. Digester 2 is a fixed-dome acid anaerobic digester and receives thickened sludge from the GT and DAFT systems. Digested sludge from Digester 2 is transferred to Digesters 3 and 4. Digesters 3 and 4 are floating-dome digesters and may be fed in series or parallel depending on the mode of operation. Plate and frame heat exchangers from the hot water system and recirculation pumps maintain temperatures from 97 to 128 degrees Fahrenheit. Gas mixers recirculate digester gas and use it to mix the digesters' sludge content with gas cannon mixers. Gas piping connected to the top of each digester allows the digester gas produced to enter the gas conveyance system. Several pressure vacuum regulated valves and J-tube safety blow-offs are installed on each digester to prevent over-pressurization.

Sludge Transfer System
RP-2 is equipped with several pumps and automated valves to transfer sludge through the digestion system.

Hot Water System
The hot water system generates heat in the boilers and cogeneration engines. Two boilers are fueled by digester or natural gas or both. Two tubes in tube heat exchangers are dedicated to heat Digester 2 and two spiral heat exchangers are dedicated to Digesters 3 and 4.The hot water is pumped into a hot water loop, where heat exchangers are used to heat the digestion system.

Gas Conveyance and Waste System
Digester gas collected from the digestion system enters the gas loop and is used for sludge mixing, fuel for boiler, and engine co-generation, or could be wasted to a waste gas burner (flare) when excess gas is in the system. The digester gas may be stored in either a low- or high-pressure tank. Gas compressors are used to compress digester gas into the high-pressure tank. The gas loop has several J-tubes and pressure-vacuum relief valves to prevent over-pressurization. An iron sponge using ferric oxide-impregnated media is used to reduce the hydrogen sulfide content in the gas of Digester 2 before entering the gas loop.

RP-2 Lift Station
The RP-2 lift station collects raw sewage from the Mountain Avenue interceptor, Chino Institute for Women (CIW) sewer, Butterfield force main, and recycle flows from the solids treatment facilities at RP-2, and discharges through a 24-inch pipeline to the RP-5 headworks.

Gas Conveyance and Waste Gas System
Gas collected from the digestion system enters the gas loop, which can deliver low-pressure gas to the compressors for use in the boiler or fuel cell or to the flare. The gas loop has several J-tubes to prevent over-pressurization. Iron sponges are used to remove hydrogen sulfide from the digester gas. Digester 2 has a waste gas line that can deliver low-methane-content gas directly to the flare.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Solids Treatment Process	26.4 MGD	
GT System Tank Drive Pumps	 2 @ 760 gpd/ft^2 1,590 ft^2 2 @ 10 hp 210 gpm 15 hp	 Per Unit Per Unit
DAFT System Tanks Recirculation Pumps Sludge Pumps Polymer Blending Units Compressors	 2 @ 25 gpd/ft^2 707 ft^2 5 @ 40 hp 3 @ 210 gpm 10 hp 2 @ 8.0 gph 4.5 hp	 Per Unit Per Unit Per Unit Per Unit
Digester System Digester No.1 & 2 Digester No.3 & 4 Recirc. Pumps Heat Exchangers Tube in Tube Spiral Plate Gas Mixers	 2 @ 489,565 gallon 2 @ 1.79 MG 3 @ 530 gpm 10 hp 3 @ 412 gpm 15 hp 2 @ 2.5 MMBTU/hr 2 @ 2.0 MMBTU/hr 2 @ 2.6 MMBTU/hr 3 @ 200 SCFM 25 hp	 Per Unit Per Unit Per Unit Per Unit Per Unit Per Unit Per Unit Per Unit
Sludge Transfer System Digester No.2 Pumps Digester 3 & 4 Pumps	 2 @ 300 gpm 15 hp 2 @ 500 gpm 25 hp	 Per Unit Per Unit
Hot Water System Boiler Hot Water Pumps	 1 @ 3.1 MMBTU 1 @ 3.7 MMBTU 2 @ 400 gpm	
Engine Recovery	3 @ 500 gpm 2 @ 640 gpm 2.15 MMBTU/hr 2.68 MMBTU/hr	
Gas Conveyance System Waste Gas Burner Iron Sponges Gas Compressors	 1 @ 350 ACFM 12.6 MMBTU/hr 1 @ 224 ft^3 2 @ 60 hp 1 @ 50 hp	
RP-2 Lift Station Pumps	 3 @ 3,300 gpm 100 hp	

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
GT System	3	3	4	3
DAFT System	4	3	4	3
Digester System	4	3	3	3
Sludge Transfer System	3	3	3	3
Hot Water System	3	3	3	3
Gas Conveyance System	3	3	3	3
RP-2 Lift Station	4	3	3	4

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

Gravity Thickeners System
Rags and large debris pass through the influent distribution box and into the GT influent center-feed columns, where frequent clogging occurs. A project is not needed

DAFT System
No issues require special attention.

Digester System
Digester 2 is has recently been rehabbed, but the T-lock lining system inside the digester needs to be repaired/replaced per the condition assessment. Cracks and stains on digester walls are noted.

Sludge Transfer System
No issues require special attention.

Hot Water System
No issues require special attention.

Gas Conveyance System
No issues require special attention.

RP-2 Lift Station
Lift station emergency generator not keeping pumps running during power outages. E&I to place filter on power source to LIT.

Table 3 History of Select Assets

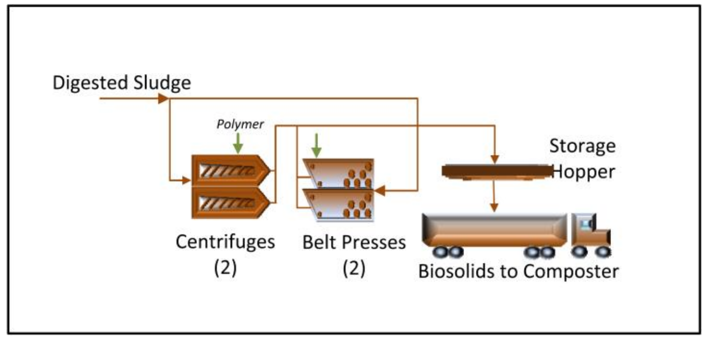
System	Capital Improvement Project Activity	Condition Assessment Report
GT System	1971 1988 2009	
DAFT System	1988	
Digester System	1960 1971 1979 1988 2003 2009 2011 2014	Dig. 2 – Completed 2022 Dig. 3 – Completed 2022 Dig. 4 – Completed 2022
Sludge Transfer System	1979 1988 2003	
Hot Water System	1988 2003 2013	
Gas Conveyance System	1988 2003	
RP-2 Lift Station	2004	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
Lift Station	RP-2 Lift Station Generator	The project will involve making the generator a more reliable source of temporary power.

Asset Management System Summary – RP-2
Dewatering Treatment Process
1. Asset Profile



Sludge Grinding System
Digested sludge from Digesters 3 and 4 pass through dedicated sludge grinders before the sludge enters the dewatering feed pumps. Three inline grinders ensure that large solid objects are broken up into small pieces to limit the possibility of plugging downstream piping or equipment.

Sludge Feed Pump System
Three sludge feed pumps pump sludge to the belt press system or the Centrifuge System, or both. The sludge pumps are variable speed with flow meters, instrumentation, and controls.

Polymer Blending System
The dewatering polymer system consists of three chemical metering pumps, three polymer blending units, and static mixers to mix the polymer with the sludge. Polymer is delivered in totes and pumped by the chemical metering pumps, mixed with dilution water, and dosed to the sludge flow.

Belt Press System
The RP-2 belt press system consists of two belt filter presses. A feed box receives sludge flow mixed with polymer and spreads flow across the width of a rotating porous belt. The sludge flow on the belt passes through a series of wedges that separate the sludge and allow collected filtrate to pass through the belt to a drip pan that is piped to the filtrate and centrate pumping system. The sludge flow then passes through the pressured zone, where sludge is pressed between two belts and allowed to drain. The compressed sludge then passes over a series of rollers that squeeze out remaining filtrate to drip pans. The belts then separate, and two scraper blades scrape the dewatered solids (cake) off of each belt, dropping the processed cake on to the conveyor system. Wash-water pumps supply water to spray each belt with high-pressure water to prevent the porous belts from clogging.

Centrifuge System
The sludge flow mixed with polymer enters the feed tube of the centrifuge and discharges into a spinning bowl. The centrifugal force of the spinning bowl forces the heavier solids to the edge of bowl and centrate to rest on top of the solids. A scroll spinning, slightly faster than the bowl, scraps the solids around the edge of the bowl to one end of the centrifuge, up a beach and into the discharge shoot to the conveyor. Dam plates near the center of the spinning bowl hold a depth of centrate until it overflows the opposite end of the centrifuge where it is piped to the centrate wet well.

Conveyor System
Two belt press conveyors transfer cake from the discharge of each belt press and then transfer the collected solids up to the top of the cake hopper. Six shaftless screw conveyors transfer cake from the discharge of each centrifuge to a common belt conveyor. The dewatered cake then travels up to the cake hopper, where it is distributed evenly on the trailer of a sludge hauling truck.

Cake Hopper
The cake hopper receives cake from the conveyor system and holds the cake until a loading sequence has been initiated to discharge the solid cake to a truck trailer for hauling to an offsite facility.

Filtrate and Centrate Pump System
Filtrate and centrate collected from the belt press and centrifuge processes are conveyed to a common wet well where they are pumped into the RP-2 lift station wet well and discharged to RP-5.

2. Capacity Profile
Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Dewatering Treatment Process	30 MGD 211K wet tons per year	
Sludge Grinding System	3 @ 210 gpm	
Sludge Feed System Pump	3 @ 210 gpm 10 hp	
Polymer Blending System Polymer Pump Dilution	3 @ 8.0 gph 3 @ 1200 gph	
Belt Press System Belt Press Wash-water pump	2 @ 150 gpm 1,700 dry lbs/hr 3 @ 100 gpm 7.5 hp	
Centrifuge System Centrifuge Main Drive Back Drive	2 @ 325 gpm 1,200 hp 40 hp	
Conveyor System Belt Conveyor Screw Conveyors	2 @ 44,000 lbs/hr 1 @ 350 ft^3/hr 3 hp 3 @ 700 ft^3/hr 3 hp 2 @ 700 ft^3/hr 7.5 hp 1 @ 1600 ft^3/hr 15 hp	
Cake Hopper	1 @ 1,956 ft^3	
Filtrate and Centrate Pump Station Pumps	2 @ 480 gpm, 7.5 hp	

3. Asset Ratings
Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Sludge Grinding System	3	3	3	3
Sludge Feed Pump System	3	4	3	3
Polymer Blending System	3	3	3	3
Belt Press System	4	4	4	4
Centrifuge System	3	3	3	3
Conveyor System	3	3	3	3
Cake Hopper	3	3	3	3
Filtrate and Drainage Pump Station	3	3	3	3

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation
Sludge Grinding System
No issues require special attention.

Sludge Feed Pump System
Sludge feed pump no. 1 has been down for several months.

Polymer Blending System
No issues require special attention.

Belt Press System
Overhauling of both belt press units going to be performed over the next couple of months.

Centrifuge System
No issues require special attention.

Conveyor System
No issues require special attention.

Cake Hopper
No issues require special attention.

Filtrate and Centrate Pump System
No issues require special attention.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Sludge Grinding System	1988	
Dewatering Sludge Feed Pump System	1988	
Polymer Blending System	1979 1988 2011	
Belt Press System	1979 1988 2013	
Centrifuge System	2001	
Conveyor System	1979 1988 2008	
Cake Hopper	1988 2008	
Filtrate and Centrate Pump Station	1979 1988	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
Solar Pad	RP-2 Biosolids Solar Pad Repair	The project will involve removal of debris, setting edges for repair, and placement of new asphalt.

Asset Management System Summary – RP-2

Auxiliary Systems

1. Asset Profile

Plant Drain
The plant drain collects surface storm runoff, excess irrigation, and wash-down water collected in submersible drains located throughout the facility. The drain system receives gravity flows throughout the facility and is pumped to the RP-2 lagoon, the RP-2 lift station and finally to RP-5 headworks.

Electrical System
The electrical energy to power the treatment facility is obtained from the local electrical grid (SCE and Direct Access) and onsite co-generation. The electrical feed from the grid is composed of two 12 kV feeders to the power panel switchgear, where transformers and switchgear are located to distribute electrical energy throughout the facility. A single line diagram of the RP-2 electrical system is shown in Appendix B.

A 300 kW diesel emergency generator is used in the event of a power failure to power the RP-2 lift station.

Utility Water System
Utility water is used throughout the facility to clean, supply pump seal water, cool, dilute, flush clogged pipes, irrigate, and more. The system is supplied by the pump station. The piping consists of several isolation valves and point-of-use connections.

Potable Water System
Potable water is used throughout the plant for restrooms, cooling, odor scrubber dilution water, fire suppression, and more. The system is supplied from a service on a potable line off El Prado Rd. from the City of Chino. The system has several backflow devices to protect the drinking water system.

Instrumentation and Control System
An extensive array of instruments is used to monitor and control the processes at RP-2. Nearly all the processes at the plant are observed and controlled from a centralized SCADA system. Control wiring and local panels are provided at individual pieces of equipment, and control wiring transmits data to three main control terminals at RP-2.

Yard Piping
A substantial network of pipes is used to convey flows between unit processes. The material, sizes, and service conditions of these pipes vary widely.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Plant Drain	2 @ 200 gpm	
Electrical System Utility Voltage Transformers Switchgear Distribution Generator	 2 @12 kV 2 @ 12 kV to 480 V 2 @12 kV 5 @ 480 V 1 @ 600 kW 1 @ 300 kW	
Utility Water System Pipelines Pump Station Valves	 Various sizes Fed from RP-5 PS >10 units	
Potable Water System Backflow Devices	 >10 units	
Instrumentation and Control System HMI Workstation RTU PLC I/O Hub Radio Transmitter		

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Plant Drain	3	3	3	3
Electrical System	3	3	3	3
Utility Water System	4	4	3	4
Potable Water System	3	3	3	3
Instrumentation and Control System	3	3	3	3
Yard Piping	3	3	3	3

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

Plant Drain
No issues require special attention.

Electrical System
No issues require special attention.

Utility Water (UW) System
Isolation valves are not working.

Potable Water System
No issues require special attention.

Instrumentation and Control System
No issues require special attention.

Yard Piping
No issues require special attention.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Plant Drain	1979	
Electrical System	1979 1988 2008	
Utility Water System	2004	
Potable Water System	1979	
Instrumentation and Control System	1979 1988 2008	
Yard Piping	1979 1988	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
Lagoon	RP-2 Lagoon Vegetation Removal	The project would involve major contractor activity to remove vegetation and haul away debris. It would involve the use of a crane, bucket and roll off dumpsters. Also, if the lagoons are to be retained as overflow protection they should be lined with concrete or some other impervious material to prevent the re-establishment of vegetation on the slopes and floor of lagoons.
Utility Water Valve	RP-2 UW Valve Installation	The project will involve installation of 2 valves in locations indicated, and replacement of one butterfly valve. These valves will allow complete isolation of area in question. The dewatering and digester areas already have valves in place that allow isolation of those areas if needed.

End of System Summary

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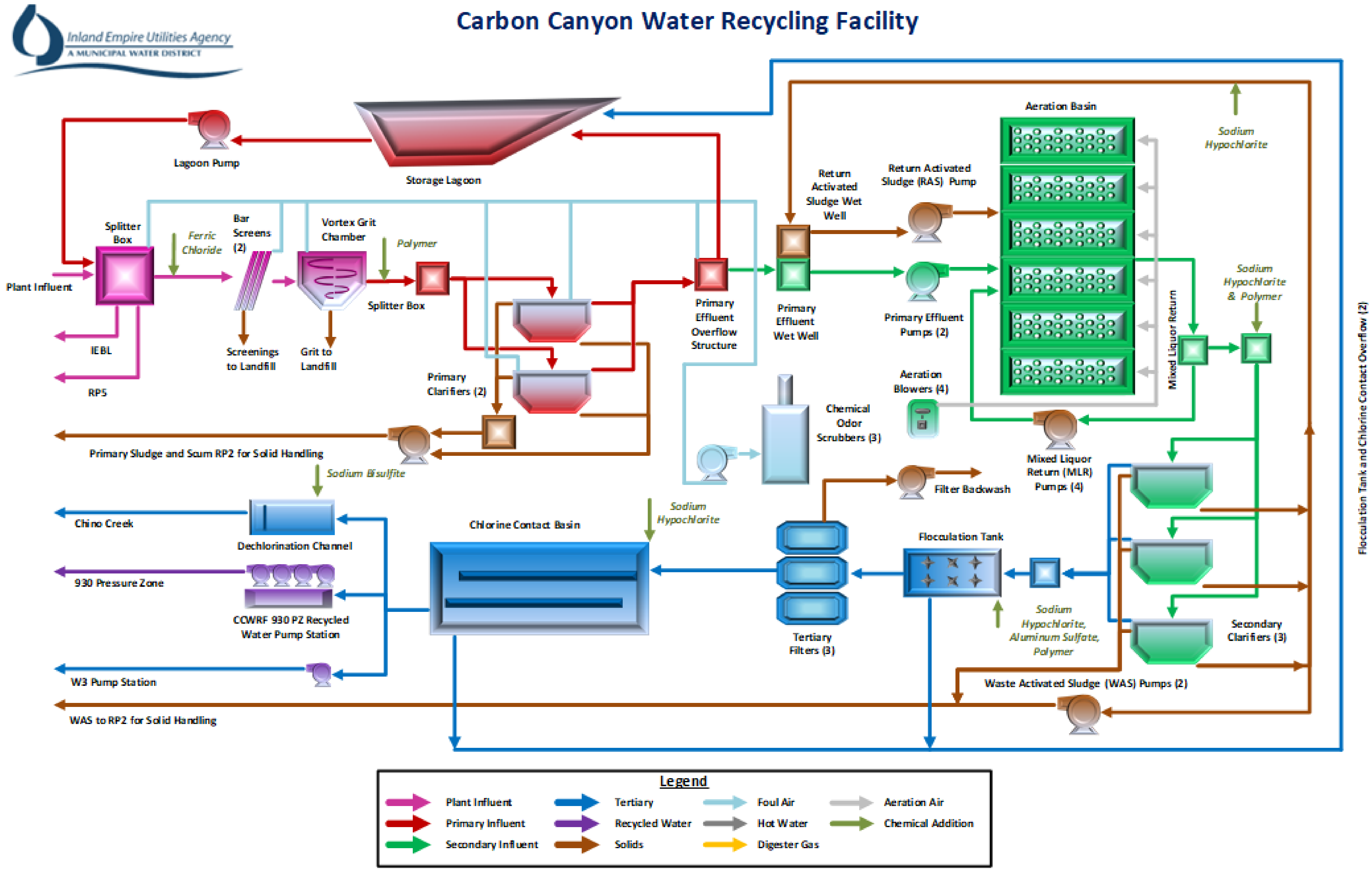

Figure 7-4: Carbon Canyon Water Recycling Facility (CCWRF) – Schematic

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Table 7-4: Carbon Canyon Water Recycling Facility – Project Summary

#	Project Number[1]	Project Name	Project Description	Fund[2]	Project Type[3]	Fiscal Year Budget (Dollars)										
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Ten-Year Total
1	EN23004	CCWRF Aeration Basins 1-6 Drain Valve Replacements (Joel Ignacio)	The project scope consists of evaluating the drain sumps to verify the type of plug used to keep from potential backflow due to the drain valves not holding. Replace the existing 6' drain valves for aeration basins 1-6.	RO	CC	0	250,000	950,000	0	0	0	0	0	0	0	1,200,000
2	EN17006	CCWRF Asset Management and Improvements (Joel Ignacio)	The project will provide process improvements to the preliminary, primary and secondary treatments including the replacement of the existing headworks, the odor control system and the aeration blowers	RC	CC	0	9,000,000	16,000,000	699,853	0	0	0	0	0	0	25,699,853
3	EN18036	CCWRF Asset Mgmt and Improvement Pkg. III (Adham Almasri)	Improvement of the tertiary treatment, lining of the emergency storage lagoon and making grading and drainage improvements. 1. Replace the leaky tertiary filters' weirs.2. Demolish the old chlorine disinfection system, its associated pumps and pipelines at the tertiary filters.3. Replace the existing filter panel (for controls) with a new PLC and tie-to SCADA.4. Sand, recoat and paint the monorails at the tertiary filter and all other applicable metal surfaces .5. Recondition the thirteen (13) cast iron gates at the filters. Install actuators and tie-to SCADA for automation.6. Evaluate the traveling bridge system for each filter. 7. Evaluate adding a cover to the CCB. 8. Provide concrete lining to the lagoon as reinforcement to prevent side slope erosion and mitigate rodent holes. 9. Automate the existing lagoon discharge pump and integrate into the SCADA system. 10. Replace the area velocity meter at the CCB to the Chino Creek with Parshall Flume. 11. Replace the existing prop flowmeter from CCB to Recycled Water Pump Station wet well with a magnetic flowmeter or approved technology. 12. Remove the existing W3 system and add a cross connection with backflow prevention between the existing potable water line and the utility water well for redundancy and reliability. 13. Rehabilitate the eight (8) drain valves at the center of the CCB. 14. Perform coordination study, arc flash study, adjust settings and test for the new	RC	CC	0	0	0	0	200,000	500,000	300,000	0	0	0	1,000,000

#	Project Number[1]	Project Name	Project Description	Fund[2]	Project Type[3]	Fiscal Year Budget (Dollars)										
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Ten-Year Total
			transformer added. 15. Evaluate the walkways, drive aisles, and pavements throughout the facility and provide recommendation and engineering design to mitigate the issue of differential settlements and surface cracks. Scope to address all concrete and pavement works.													
4	EN23005	CCWRF Filter Effluent Sodium Hypochlorite Modification (Joel Ignacio)	This project is to replace existing manual valves with automatic valves.	RC	CC	0	50,000	55,000	0	0	0	0	0	0	0	105,000
5	EN23074	CCWRF Influent Box Rehab at the Primary Clarifiers (Joel Ignacio)		RO	CC	0	600,000	0	0	0	0	0	0	0	0	600,000
6	EN23035	CCWRF RAS Header Replacement (Ryan Ward)	The systems that needs to be replaced are the (3) 16" connections points to the RAS main header, coming from the secondary clarifiers, along with approximately 22 ft of 36" coated steel pipe. There is a potential need for a bypass system since there is not one currently at CCWRF. Shut down hours at CCWRF are from 2300-0700 hours and piecing together a main header during those shut down hours is undesirable because of the mass amount of welding that would take place. Prefabricating the piping and connections and connecting it during one shut down might be a possibility. On-call consultants will also be used to discuss 90 degree vs 45 degree connections as well as pipe material suited for this type of liquid.	RO	RP	0	100,000	185,000	0	0	0	0	0	0	0	285,000
7	EN23038	CCWRF HVAC System Upgrade (Joel Ignacio)	The systems that needs to be replaced are the Operations building chilled water air handlers, boilers, zoning, and controls. These are original and many of the components are obsolete. This makes repairs difficult and sometimes impossible causing the need to create alternatives to maintain operation. Such alternatives are components not originally designed for the existing system but used to make it work. The blower building evaporative coolers are in disarray. They are literally rusted	RO	RP	50,000										50,000

#	Project Number[1]	Project Name	Project Description	Fund[2]	Project Type[3]	Fiscal Year Budget (Dollars)										
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Ten-Year Total
			through as well as a portion of the ducting, which is a near-miss safety issue for anyone working in the area. This project has already been discussed in a asset management meetings.													

(1) Project Number – from Ten-Year Capital Improvement Project; Final Capital Project List 03-17-2014
(2) Project Fund – Administrative Services (GG), Non-Reclaimed Water (NC), Regional Composting Authority (RM), Ground Water Recharge (RW), Recycled Water (WC), Regional Capital (RC), Regional O&M (RO), or Water Fund (WW)
(3) Project Type – Capital Construction Project (CC), Capital Major Equipment Project (EQ), Operations & Maintenance Project (OM), Reimbursable Project (RE), or Capital Replacement Project (RP)

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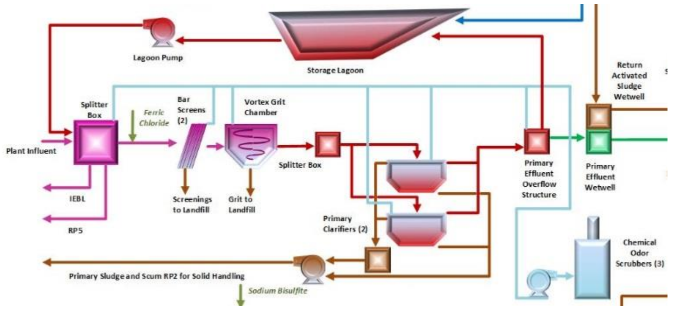
Asset Management System Summary – CCWRF

Preliminary Treatment Process

1. Asset Profile



Influent Channel
Raw wastewater enters Carbon Canyon Water Recycling Facility (CCWRF) through the influent diversion structure. The influent diversion structure enables CCWRF to operate as a skimming plant, taking the majority of raw wastewater and sending the remainder to RP-5. The amount of flow to RP5 is measured at the Parshall flume downstream of the diversion structure, and CCWRF influent is measured at the Parshall flume downstream of the vortex grit chamber.

Screening Equipment
Gates divert flow to three channels: two mechanical bar screens and one manual bar screen. The 5/8-inch bar screens remove rags and large debris that could damage the downstream process equipment or reduce the overall reliability and effectiveness of the treatment process. A manual bar screen provides standby capacity for the mechanical units.

Vortex Grit System
Flow from the bar screens structure is tangentially directed to a 16-foot-diameter circular vortex grit chamber. A paddle mixer pushes flow in a circular path; grit collects at the bottom, where it is pumped to the grit washing/disposal system.

Grit Washing/Disposal System
Grit pumped from the vortex grit chamber is routed to two grit classifiers, where organic matters are removed from the grit. The grit sinks to a submerged inclined screw and moves up the ramp while being washed. The organic rich liquid from the grit classifiers is directed back to the liquid handling stream.

Screening Conveyance/Disposal System
Screening collected by the bar screens is transported by a conveyor and dropped into a hydraulic washer/compactor. The collected rag is washed and organic rich rinsate is routed to liquid treatment. The hydraulic compact or squeezes out the excess water, reducing the moisture content. The compacted rags are pushed out to the roll-off bin for disposal.

Ferric Chloride System
Ferric chloride is added to the raw wastewater flow immediately after the influent diversion structure to enhance the solids capture during primary treatment and to control odors caused by hydrogen sulfides. The ferric station consists of a truck filling station, 7,000-gallon storage tank, two chemical metering pumps, and associated piping.

Headworks Splitter Box
The headworks splitter box receives flow from the vortex grit chamber. The flow is normally routed to primary clarifiers; however, it can also be routed to the primary effluent structure, bypassing the primary treatment.

Odor Control Chemical Scrubber
Foul air collected in the preliminary and primary treatment processes are forced through three chemical odor control scrubbers where bleach solution is atomized to chemically remove and oxidize hydrogen sulfide and odor causing gases. The system consists of co-current scrubbing vessel, bleach metering pumps, foul air blowers, air blowers and the associated conveyance pipes.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Preliminary Treatment Process	20.3 MGD	
Influent Channel Sewer Parshall Flume Gates	 54-inch 1 @ 43.9 MGD 2 units	
Screening Equipment Mechanical Screen Manual Screen Gates	 2 @ 20 mgd 1 @ 40 mgd 3 units	 Per Unit
Vortex Grit System Chamber Grit Pump Gates	 1 @ 20.3 mgd 2 @ 220 gpm 15 hp 2 units	 Per Unit
Grit Washing & Disposal System Classifiers	 2 @ 200 gpm	 Per Unit
Screening Conveyance & Disposal System Conveyor Compactor Grinder Auger	 1 hp 10 hp 3 hp	
Ferric Chloride System Tank Pumps	 7,000 gallons 2 @ 92 gph	 Per Unit
Headworks Splitter Box Gates	 3 units	
Odor Control Chemical Scrubbers Blower(1A) Blower(1B1,1B2) Valves	 1 @ 6,500 scfm 2 @ 4,400 scfm 3 units	 Per Unit > 18-inch

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Influent Channel	3	3	3	3
Screening Equipment	5	4	5	4
Vortex Grit System	4	4	3	4
Grit Washing & Disposal System	3	3	3	4
Screening Conveyance/Disposal System	4	4	4	4
Ferric Chloride System	4	3	4	3
Polymer System	N/A	N/A	N/A	N/A
Headworks Splitter Box	4	3	3	3
Odor Control Chemical Scrubber	4	4	4	4

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

Influent Channel
CCWRF lagoon pump discharges to upstream of RP5 and CCWRF control gates in the influent diversion structure. The flow may go to RP5, CCWRF or both. There is no flow meter to quantify the amount of flow into the lagoon. Because of this efficiency, the lagoon flow may be double counted as CCWRF influent.

Screening Equipment
The bar spacing allows a large volume of rags to reach downstream processes.

The clearance between the bar screens and the enclosure of the structure is tight, making it difficult for maintenance or housekeeping.

Downstream gates seizing up and bypass channel unusable

Vortex Grit System
The influent gates to grit system are seizing up. Grit System bypass has never been used. No running status on SCADA due to input/output on electrical issues.

Grit Washing/Disposal System
No issues require special attention.

Screening Conveyance/Disposal
Rag builds up on scraper and water builds up on the front end of conveyor near the drive motor.

A new rag washer and compaction unit was installed in 2014, reducing the moisture content of screening material

Ferric Chloride System
Ferric chloride system operates effectively and recoated of chemical containment area was recently performed.

Headworks Splitter Box
Fiberglass covers and concrete around structure.

Odor Control Chemical Scrubbers
The existing concurrent odor control system is in poor condition. The pH, H_2S, pressure transmitters, pumps, and control equipment are broken and inoperable. Sections of bleach conveyance system are frequently clogged with deposits, restricting the flow chemical and requiring additional manpower for upkeep. Bleach and caustic storage tanks are more than 20 years old, and there is evidence of leakages at the flanges. A viable alternative is immediately needed for compliance and reliability.

An in-house maintenance project was completed in 2015 to improve short to midterm reliability. The project installed a mist elimination at System A to prevent bleach emission and repaired System B and C fiberglass vessels to stop the leak.

Project EN17006 will address these issues.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Influent Channel	1993 2006	Planned 2027
Screening Equipment	1993	Completed 2022
Vortex Grit System	1993	Planned 2027
Grit Washing/Disposal System	1993	
Screening Conveyance/Disposal System	1993 2014	
Ferric Chloride System	1993	
Polymer System	1993	
Headworks Splitter Box	1993	
Odor Control Chemical Scrubber	1993 2011 2012	

* Appendix B – Condition Assessment Reports

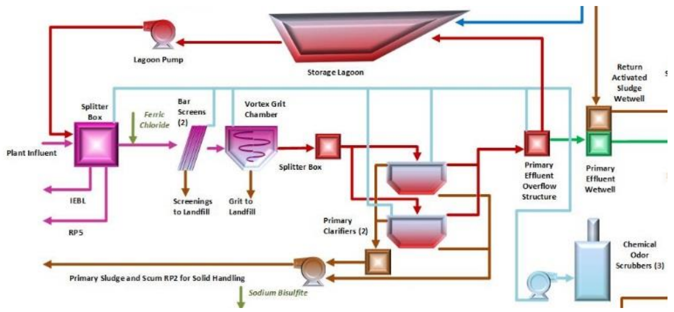
Table 4 Potential Projects

System	Project Name	Project Description
Headworks	CCWRF Headworks Structure Concrete Repair	Removal and replacement of compromised deteriorating concrete sections.

Asset Management System Summary – CCWRF

Primary Treatment Process

1. Asset Profile



Primary Splitter Box
The splitter box receives flow from the vortex grit chamber. By using a system of gates, the flow is routed to one or two clarifiers or is bypassed to Primary Effluent Overflow Structure. The splitter box has provisions for future expansions and points of connections are established. The splitter box shares a common wall with the primary effluent structure.

Primary Clarifiers
Two 95-foot diameter, center-feed, circular primary clarifiers provide sedimentation. Gear-driven flights direct settled solids to the center, and floatable scum to a system of pumps that discharge to an intermediate wet well for temporary storage. The primary effluent is routed by gravity to the primary effluent splitter box, where it is combined with the effluent from other primary clarifiers, and then flows by gravity to the primary effluent pump station.

Sludge Pumping System
Primary sludge is pumped out of the primary clarifiers continuously to RP2 for solid handling. A system of valves automatically alternates between the two clarifiers on operator selected timer.

Scum Pumping System
Scum collected in the primary clarifiers is directed to an intermediate wet well and is combined with spent bleach from System B and C. Depending on the level, a transfer pump will pull from the wet well and pump to RP2 for solids thickening. The scum collection system and intermediate wet well are covered, and the vapor space is connected to the odor control chemical scrubbers.

Primary Effluent Overflow Structure
Primary treated water is routed to the primary effluent overflow structure by gravity before it reaches the primary effluent pump station. By a system of pipes established at pre-set elevations, the primary treated water is routed to (1) the primary effluent pump station for secondary treatment or (2) the storage lagoon if there is a power failure or mechanical problem or if the system is hydraulically overloaded.

Storage Lagoon System
Storage lagoon features an onsite, short-term storage capacity of primary effluent, secondary effluent, or tertiary effluent. The primary effluent passively overflows into the storage lagoon in the event of primary effluent pump failure or power outage. Secondary effluent can overflow into the storage lagoon if the filter influent gate closes. In addition, if a noncompliant condition is reached at the tertiary section, tertiary effluent can be overflown into the storage lagoon. The floor of the lagoon is covered with concrete, and the side slope has vegetation to counter the effect of erosion. Stored water is pumped back into the influent diversion structure on an operator selected time and is retreated in the liquid treatment process.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Primary Treatment Process	13.2 MGD	
Primary Splitter Box Gates	 3 units	
Primary Clarifiers Drives Gates	2 @ 1,760 gpd/ft^2 7,088 ft^2 1 @ 0.5 hp 4 units	Per Unit Per Unit
Sludge Pumping System Pumps	 2 @ 220 gpm 30 hp	 Per Unit
Scum Pumping System Pump	 2 @ 220 gpm 10.5 hp	 Per Unit
Intermediate Wet Well Gates	 N/A units	
Storage Lagoon System Gates Pump	1 @ 9.0 MG N/A units 1 @ 1,500 gpm 30 hp	
Primary Effluent Overflow Structure Gates	 N/A Units	

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Primary Splitter Box	4	3	4	4
Primary Clarifier	5	3	3	3
Sludge Pumping System	4	4	4	4
Scum Pumping System	3	3	3	3
Intermediate Wet Well	4	4	4	4
Storage Lagoon System	4	3	4	4
Primary Effluent Overflow Structure	3	3	3	3

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

Primary Splitter Box
Three gates are utilized to either route flow to or bypass primary clarifiers. Two gates that route flow to primary clarifier are normally opened but are typically not exercised. Conversely, the bypass gate is normally closed and is not typically exercised. The functionality of these gates are very hard to move.

Primary Clarifiers
Concrete surfaces need to be recoated. Concrete is noted as eroding.

Sludge Pumping System
80 gpm max output. Lack of redundancy due to scum wetwell availability.

Scum Pump System
The scum wet well has limited controls and instrumentation. The floatables form a raft in the wet well, and the scum pump suction pulls from the bottom of the scum box. The floatables must be cleaned regularly.

Intermediate Wet Well
Scum wet well #1 influent valve seized up. Condition inside is unknown and needs to be inspected.

Storage Lagoon System
Some erosion is noted. Only one pump is available.

Primary Effluent Overflow Structure
No issues require special attention.

Table 3 History of Select Assets

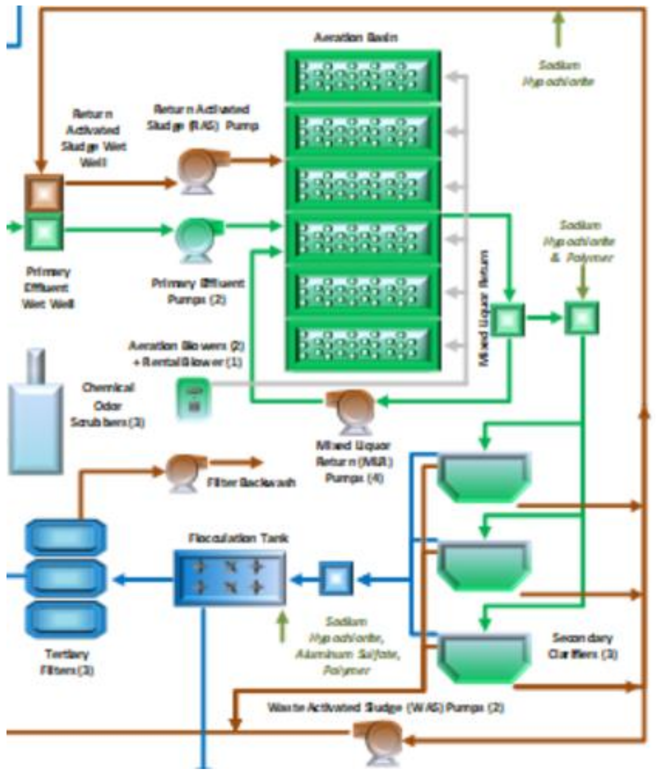
System	Capital Improvement Project Activity	Condition Assessment Report
Primary Splitter Box	1993	
Primary Clarifiers	1993 2006	No.1 – Planned 2024 No.2 – Planned 2024
Sludge Pumping System	1993	
Scum Pumping System	1993 2006	
Intermediate Wet Well	1993	
Storage Lagoon System	1993	
Primary Effluent Overflow Structure	1993	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
Primary Clarifier	CCWRF Primary Clarifier Coating No. ENXY14	Evaluate the coating and concrete and repair/re-coat as needed.
Primary Clarifier	CCWRF Primary Dewatering Wetwell Inlet Valves No. ENXy15	The project scope consists of evaluating the drain valves and replacing as needed.
Primary Clarifier	CCWRF Primary Scum Wetwell Inlet Valves No. ENXY17	Replace inlet valves for both Scum Wetwells as needed.

Asset Management System Summary – CCWRF
Secondary Treatment Process
1. Asset Profile



Primary Effluent Pump System
Primary effluent flows by gravity into the primary effluent pump station wet well. The wet well can be interconnected with return activated sludge (RAS) wet well and serve as a common wet well by opening a gate. The normal mode of operation is to operate the primary effluent wet well and RAS wet well independently. One of two vertical-turbine pumps lifts water to the aeration basin.

Activated Sludge System
There are two distribution channels for the aeration basins. By manipulating a system of gates, various combinations of primary effluent, RAS, and MLR can be introduced to the aeration basin. Normal mode of operation is to combine primary effluent, RAS, and MLR flows as one stream and distribute the stream equally to six different aeration basins. Propeller mixers are located at the distribution channel and aeration basin to promote mixing and prevent stratification of the mixed liquor.

The trains, with the exception of Train1, have baffled partitions. Each train operates in modified Ludzak-Ettinger configuration with an anoxic zone followed by three oxic zones to achieve the nitrate removal. A system of aeration sheaths, aeration control valves, and dissolved oxygen probes is used to limit or increase the volume of air introduction. The effluent from each aeration basin is combined in a common channel, a percentage of this mixed liquor is rerouted to the front of the aeration basin and the balance is routed to the secondary clarifiers.

Secondary Clarifiers
Mixed liquor from the aeration trains flows into the mixed liquor return pump station, and any unpumped mixed liquor passively flows into the secondary influent diversion structure. From the diversion structure, the flow is distributed evenly to three 120-feet-diameter, center-feed, circular secondary clarifiers. Each clarifier has a rotating sludge and skimmer arm. Solids settle to the bottom and are recycled to the aeration basin. The overflow of the secondary clarification is combined in the secondary effluent splitter box and is routed to the flocculation basin for further treatment.

Return Activated Sludge (RAS) Pumping System
The settled sludge in the secondary clarifiers is combined in the common header and routed by gravity into the RAS wet well located upstream of the aeration basin. The desired RAS flow rate at each clarifier is controlled by modulating a 16-inch flow-control valve on the RAS line. From the RAS wet well, RAS is pumped to the aeration basin distribution channel, and is mixed with primary effluent and mixed liquor return.

Waste Activated Sludge (WAS) Pumping System
To control the microorganism concentrations in the aeration system, a portion of the settled solids from the secondary clarifiers is wasted. The known volume of WAS is pumped out of the secondary system to RP2 for solid handling.

Scum Pumping System
Scum collected from the skimmer arm of the secondary clarifiers is routed to RP2 for solid handling in a common line along with WAS.

2. Capacity Profile
Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Secondary Treatment Process	12.0 MGD	
Primary Effluent Pump System	2 @ 17.6 MGD 125 hp	
Activated Sludge System Blowers Trains Depth Mixers Gates Valve Valves (air) MLR Pumps	6 @ 2.02 MGD 3 @ 6000 scfm 400 hp 10.3 psig 1 @ 6400 scfm 400 hp 12.1 psig 6 @ 1.49 MG 21 ft 22_ @ 12 hp 5 per train 4 per system 1 (FCV), 3 (manual) per unit 4 @ 7,425 gpm 50 hp	Per Unit Per Unit > 12-inch > 12-inch
Secondary Clarifiers Gates	3 @ 360 gpd/ft^2 120 ft^2 6 units	
RAS Pumping System Valves Gates	1 @ 17.6 MGD 125 hp 2 units 13 units	 > 18-inch
WAS Pumping System	2 @ 350 gpm 7.5 hp	
Scum Pumping System	3 @ 450 gpm 5 hp	

3. Asset Ratings
Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Primary Effluent Pump System	3	2	3	2
Activated Sludge System	4	5	4	4
Secondary Clarifiers	3	3	3	3
RAS Pumping System	4	3	3	4
WAS Pumping System	3	2	3	3
Scum Pumping System	3	3	3	3

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation
Primary Effluent Pump System
The primary effluent and RAS pump are reconditioned at a scheduled interval. Collectively, the pump system provides adequate pumping capacity and reliability. Two primary effluent pumps and the RAS pump were reconditioned in 2013 and 2015.

The concrete structure (primary effluent distribution channel) is showing some evidences of leakage on top, near the output side of the primary effluent pumps.

Activated Sludge System
An evidence of concrete deterioration exists on the distribution channel leading into Basin #1. The primary effluent gate to Basin #1 is reinforced externally to the concrete structure. The extent of the deterioration is appears to be superficial. However, this area shall be inspected thoroughly during the upcoming condition assessment in 2016.

The aeration flexible sheaths need to be replaced at regular (every five year) intervals because of solid build up or tears in the flexible sheath that reduce oxygen transfer efficiency . An in-house project is in progress to address this issue.

Blower #1 has high vibration issues and is out of service. Blower #3 has bad bearings and does not run. In addition, all four blowers at CCWRF are more than 22 years old and nearing the end of their service life. In addition, Blower #1, #2 and #3 do not have sufficient turn-down ratio. During the low flow condition, the activated sludge system is over-aerated, resulting in excessively high dissolved oxygen concentration. The over-aeration results in waste of energy and operational challenges. Project EN18018 will address these issues.

All the gates in the RAS distribution channel leading to the aeration basins are severely corroded and do not travel up and down. This area shall be inspected thoroughly during the upcoming condition assessment in 2016.

An 18 inch Solids Processing Recycle Pump and its associated piping is abandoned in place at Basin #1 and #2. The equipment shall be removed by the Maintenance Department.

Mixed Liquor Return Pump #1 is out of service due to defective bushing. The pump shall be refurbished by the Maintenance Department.

Secondary Clarifiers
Clarifier #1 erosion and coating deterioration. Clarifier #3 rake arm sagging and needs to be inspected.

RAS Pumping System
No issues require special attention.

WAS Pumping System
Scum pumps create back pressure when running. WAS flow meter is not consistently reading correctly.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Primary Effluent Pump System	1993 1998 2013	
Activated Sludge System	1993	Planned 2027
Secondary Clarifiers	1993 2012 2013 2015	
RAS Pumping System	1993 2013	
WAS Pumping System	1993	
Scum Pumping System	1993 2012 2013	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

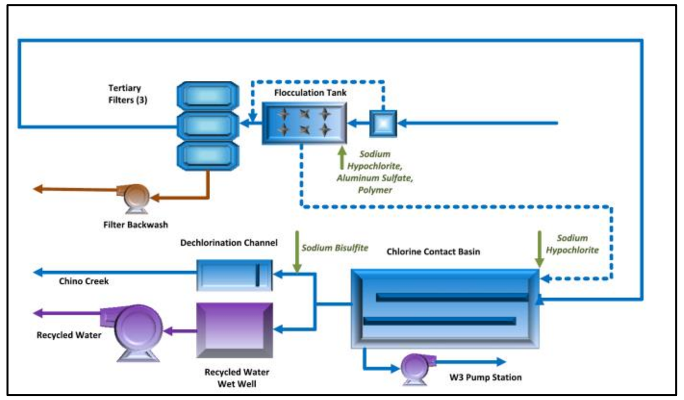
System	Project Name	Project Description
Aeration Basin	CCWRF Aeration Basin Effluent Gates	The project scope consists of evaluating aeration basin effluent gates to determine the cause of the leaks. Repair or replace the gates as needed.
Secondary Clarifier	CCWRF Secondary Clarifier Weir Covers No. ENXY18	Install secondary weir covers (similar to RP4) blocking the sunlight and preventing the algal growth
Aeration Basin	MLR Pump Station Condition Assessment and Repair No. ENXY12	Assess the severity and extent of concrete deterioration. After the findings, make appropriate repair
Aeration Basin	Paint CCWRF Blower Air and MLR Pipes at Aeration Basins No. FMXXX6	Abrasive clean the exterior of pipe (shot blast, CO2 blast and etc.) and coat with appropriate paint. Please note IEUA has standard color for each process stream - blower output and MLR.
Aeration Basin	PE/RAS/MLR Concrete Structure	Assess the severity and extent of concrete deterioration.

	Condition Assessment and Repair No. ENXY16	After the findings, make appropriate repair
Aeration Basin	Replace Aeration Basin Influent / RAS, Step feed Gates No. XXX8	Replace Aeration Basin Influent, RAS and Step Feed Gates Adham brought up V&A's condition assessment report Operation is open to re-purposing the RAS channel

Asset Management System Summary – CCWRF

Tertiary Treatment Process

1. Asset Profile



Aluminum Sulfate (Alum) System
Secondary effluents from three secondary clarifiers are combined and travel to the rapid mix system, where aluminum sulfate, sodium hypochlorite, or polymer are introduced. The chemicals neutralize and destabilize the colloidal particles and enhance the solid/liquid separation. After the chemical addition and rapid mix, the water travels through a hydraulic flocculation basin in a baffled serpentine and ends up at three sand filters that are running in parallel.

Filters
The water passes through three automatic backwashing sand filters. The backwashes are initiated by either timer or the head loss across the sand filter. Backwash water is sent to the filter backwash pump station and pumped back into the aeration basin for treatment. The effluent from the filters flows by gravity to the chlorine contact basin for disinfection.

Filter Backwash Pump Station
The scum, backwash water, and drainage from the filter are collected by gravity in the filter backwash pump station. Upon reaching the pre-set level, the filter backwash water is pumped back into the aeration basin for treatment.

Chlorination System
Two 10,000-gallon bleach tanks housed indoor receive and hold 12.5 percent sodium hypochlorite (bleach) solution. Two chemical metering pumps inject bleach into the water champ located at the chlorine contact basin and provide disinfection. Two other pumps inject bleach into either filter influent or RAS for process control.

Chlorine Contact Basins
The chlorine contact basin is a dual-cell concrete structure that uses a serpentine flow path to achieve required contact time and disinfection of treated water. The bleach is introduced at the beginning of the serpentine, and free chlorine remains in the water while undergoing a plug flow. The influent flow rate is measured by a Parshall flume, and chlorine residual is measured at three different locations: influent, mid, and final.

Dechlorination System
The final 5137 cubic feet of last pass of the chlorine contact basin is used as a dechlorination structure, where sodium bisulfite solution (SBS) is introduced. The excess effluent that is not used in the recycled water system is discharged into Chino Creek. Before the discharge, chlorine residual present in the flow is neutralized with SBS by a chemical reaction. Two units of propeller mixers and under-flow baffle promote the mixing. SBS is stored in two 5,500-gallon chemical tanks and is metered into the system via five chemical metering pumps.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Tertiary Treatment Process	15.4 MGD	
Alum System Tank Pump Mechanical Mixer	 1 @ 5000 gallons 2 @ 3.7 gph 1 @ 15 hp	
Filters Travelling bridge Backwash pump Skimmer pump Filter Loading Gates Valves	3 @ 1,600 ft^2 3 @ 0.5 hp 3 @ 400 gpm 7.5 hp 6 @ 40 gpm 0.5 hp 4 gpm/ft^2 7 units 6 units	Per Unit Per Unit Per Unit Per Unit > 18-inch
Filter Backwash Pump Station	3 @ 950 gpm 14.8 hp	Per Unit
Chlorination System Tanks Pumps Mixers	 2 @ 10,000 gallons 4 @ 77 gph 1 water champ 2 propeller mixers	 Per Unit Per Unit
Chlorine Contact Basins Gates Valves	1 @ 1.0 MG 11 units N/A units	 > 18-inch
Effluent Splitter Box Gates	 2 units	
Dechlorination System Tanks Pumps Gates	 2 @ 5500 gallon 2 @ 2.5 gph; 2 @ 20 gph; 1 @ 50 gph 2 units	 Per Unit Per Unit

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Alum System	4	3	3	3
Filters	3	3	3	3
Filter Backwash System	3	3	3	3
Chlorination System	2	2	2	2
Chlorine Contact Basins	3	3	3	3
Effluent Splitter Box	1	3	3	3
Dechlorination System	3	3	3	3

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

Alum System
The equipment is 20 years old and is approaching the end of its useful life. Two alum pumps should be replaced. This potential project should be manageable by IEUA Maintenance.

Filters
The performance of three shallow bed filters is adequate. CCWRF tertiary filter media was replaced and rehabilitated in 2012. However, most of the ancillary equipment, such as the influent gates, weir plates, and drain valves, has never been serviced since the original installation in 1993. As the service life of the ancillary equipment is nearing the end of its useful life, a provision to, at minimum, inspect the condition should be made. A condition assessment shall be performed to access the state of the assets.

Filter Backwash System
No issues require special attention, but the equipment is 20 years old and is approaching the end of its useful life.

Chlorination System
The chlorination system for the chlorine contact basin disinfection is adequate.

Chlorine Contact Basins
No issues require special attention.

Effluent Splitter Box
No issues require special attention.

Dechlorination System
No issues require special attention.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Alum System	1993	
Filters	1993 2012	
Filter Backwash System	1993	
Chlorination System	1993 2004	
Chlorine Contact Basin	1993	
Effluent Splitter Box	2014	
Dechlorination System	1993 2004 2013	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
CCB	CCWRF CCB Covers	Determine the best option for providing shade, preferably covers over the CCB and install.
Filter	CCWRF Filter Effluent Structure/Piping No. ENXy11 Renamed the project to "CCWRF Subsidence Monitoring)	Determine where the excess moisture is coming from. If there is a leak, determine if a bypass is necessary or if repairs can be made without affecting operations. Repair and backfill the area.
Filter	CCWRF Filter Inlet and Bypass Gates No. ENXXX9	The project scope consists of evaluating the 60 inch gates and repairing or replacing as needed.
CCB	CCWRF Outfall Discharge Structure and Culvert Rehab No. ENXY13	The project scope consists of evaluating structure deterioration and repairing and/or coating as necessary to prevent any further deterioration.

Asset Management System Summary – CCWRF

Auxiliary Systems

1. Asset Profile

Plant Drain
The plant drain collects surface storm runoff, excess irrigation, and wash-down water collected in submersible drains located throughout the facility. The drain system receives gravity flows to a wet well, where it is then pumped and recycled toward the secondary clarifier influent, aeration basin, or head of the treatment process.

Electrical System
The electrical energy to power the treatment facility is obtained from the local electrical grid (SCE) and from onsite energy generation (solar and emergency generators). The solar assets are owned and operated by private firms as part of power purchase agreements. The electrical feed from the grid is composed of a 12 kV feeder to the maintenance building, where transformers and switchgear are located to distribute electrical energy throughout the facility. A single line diagram of the CCWRF electrical system is shown in Appendix B.

Diesel emergency generators are used in the event of a power failure. A 1500 kW generator is located in the maintenance building and supplies power to the preliminary, primary, secondary, and tertiary sections.

An extensive lighting system is needed to illuminate the facility during dark hours. Most lighting fixtures are equipped with light sensors to turn off when sufficient lighting is provided from the sun. Lighting units are inside each of the process buildings, on equipment walls, and along the roadways for safety.

Utility Water (UW) System
Utility water is used throughout the facility to clean, supply pump seal water, cool, dilute, flush clogged pipes, irrigate, and more. The system is supplied by either 930-foot pressure zone or the W3 pump station. The piping consists of several isolation valves and point-of-use connections.

Potable Water System
Potable water is used throughout the plant for restrooms, cooling, odor scrubber dilution water, fire suppression, and more. The system is supplied from a service on Telephone Avenue from the City of Chino. The system has several backflow devices to protect the drinking water system.

Instrumentation and Control System
An extensive array of instruments is used to monitor and control the processes at CCWRF. Nearly all the processes at the plant are observed and controlled from a centralized SCADA system. Control wiring and local panels are provided at individual pieces of equipment, and control wiring transmits data to two main control terminals at the main control building and the chlorine building.

Yard Piping
A substantial network of pipes is used to convey flows between unit processes. The material, sizes, and service conditions of these pipes vary widely.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Plant Drain	10 @ 150 gpm 3 hp	
Electrical System Utility Voltage Transformers Switchgear Distribution Generator Mounted Lighting	 12 kV 12 kV to 480 V 12 kV to 4,160 V 12 kV 480 V 1 @ 1500 kW 2010 Bhp >26 units	
Utility Water System Pipelines W3 Pump Station Valves	 Various sizes 2 @ 780 gpm 40 hp 2 @ 270 gpm 20 hp 20 units	
Potable Water System Backflow Devices	 6 units	
Instrumentation and Control System HMI Workstation RTU PLC I/O Hub Radio Transmitter		

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Plant Drain	3	3	3	3
Electrical System	4	3	4	4
Utility Water System	3	4	4	3
Potable Water System	3	3	3	3
Instrumentation and Control System	4	3	4	3
Yard Piping	3	3	3	3

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

Plant Drain
No issues require special attention.

Electrical System
6000 gallon steel underground diesel tank was installed in 1990 and is nearing the end of its useful life. A potential project shall replace the underground diesel with smaller above ground storage tank.

A potential project will address these issues.

Utility Water (UW) System
The pumping capacity and the efficiency of the W3 pumps have greatly decreased over time. The pumps are designed to pump 2,100 gpm total, but they pump only half of their combined designed capacity. No action is required due to the redundancy of the RW system to support the W3 pumps.

Potable Water System
No issues require special attention.

Instrumentation and Control System
CCWRF is first plant that will benefit from the SCADA migration project, EN13016 which has been completed.

No issues require special attention.

Yard Piping
Many of the UW isolation valves do not hold, making it difficult to isolate flow during the shutdown events.

CCWRF mixed liquor line from MLR pump station to secondary clarifiers is inspected and repaired in 2015.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Plant Drain	1993	
Electrical System	1993	
Utility Water System	1993	
Potable Water System	1993	
Instrumentation and Control System	1993	
Yard Piping	1993	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

End of System Summary

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Regional Water Recycling Plant No. 4

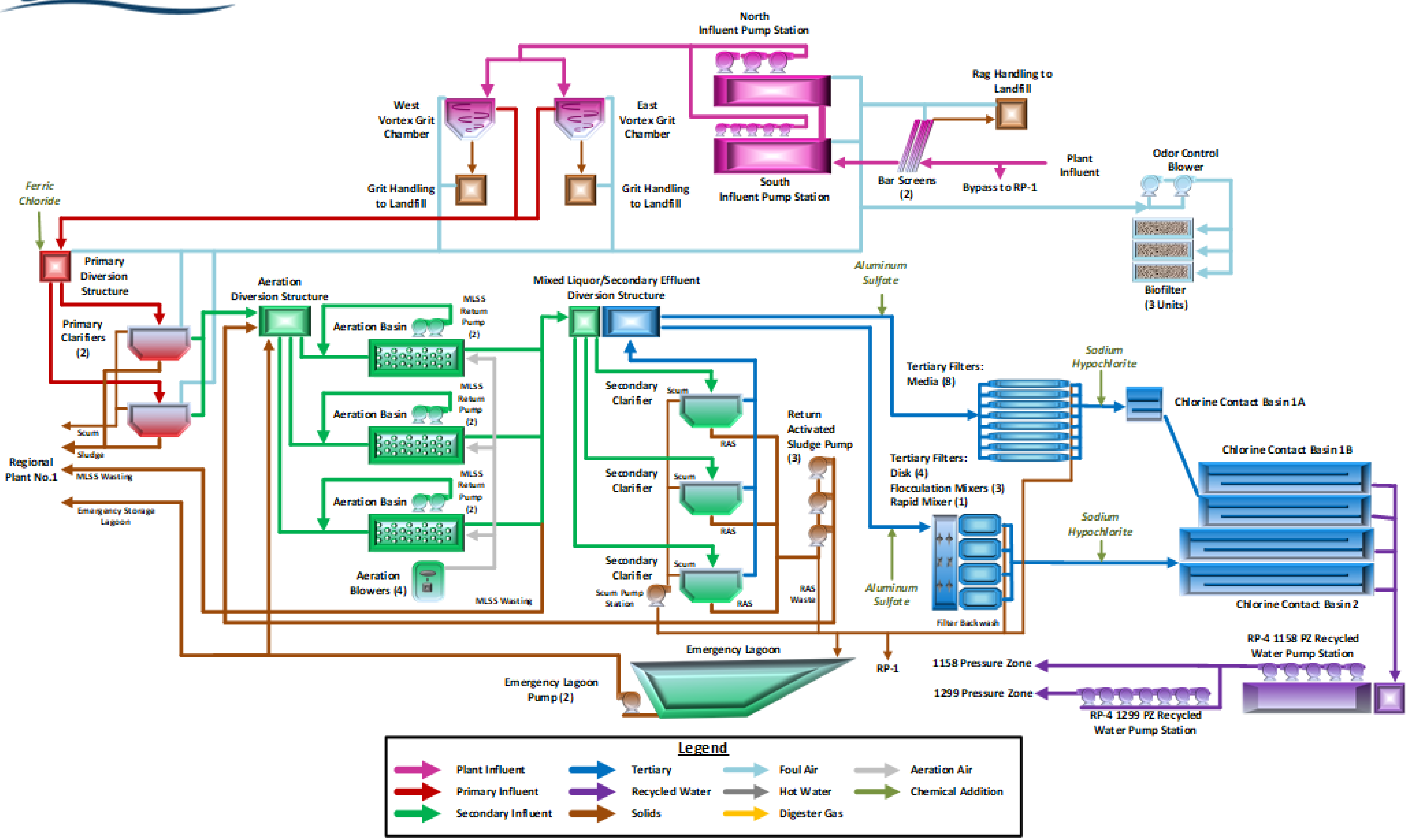

Figure 7-5: Regional Water Recycling Plant No. 4 (RP-4) – Schematic

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Table 7-5: Regional Water Recycling Plant No.4 – Project Summary

#	Project Number[1]	Project Name	Project Description	Fund[2]	Project Type[3]	Fiscal Year Budget (Dollars)										
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Ten-Year Total
1	EN23088.01	RP-4 Surcharging of Manholes Assessment	The manholes located outside of RP-4 and one inside the plant have deteriorated beyond their useful lifespan and need to be rehabilitated. It has also been noted that the manholes are surcharging during normal operations and that some flows may be bypassing RP-4 and going down to RP-1 when the San Bernardino Pump Station is in normal operation. EN19025 (Regional Force Main Improvements Project) added 14 manways to each force main so the lines can be cleaned and inspected. Because the manholes is surcharging the San Bernardino and Etiwanda Sewer Force Mains are always full and cannot be isolated for cleaning and inspection.	RO	OM	100,000										
2	EN21041	RP-4 Contact Basin Cover Repair & RW Wet Well Passive Overflow Improvement (Jamal Zughbi)	The scope of work includes assessing the existing covers, determining the full extent of the corrosion and erosion concerns, and providing the immediate repair or replacement of the covers. This will also provide the design and construction of the diversion from Passive Overflow to the Lagoon System.	WC	RP	700,000	2,500,000	1,400,000								4,600,000
3	EN23115	RP-4 Headworks Utility Water Addition (James Spears)	The scope of this project includes adding a new potable water connection to headworks for the screen annd washer compacter system. The new potable water line and connection to headworks for new influent screens and washer compact when RW is unavailable will include an air gap or backflow device to prevent cross contamination.	RO	CC	175,000	0									175,000
4	EN23123	RP-4 Outfall Valve Replacement and Blow off Upgrades (James Spears)	The following are Operations and Maintenance's expectations and corresponding recommendations: 1. Install four new 42" butterfly isolation valves. 2. Removal of broken 42" butterfly valve on Airport Drive and replace with spool to relieve system bottleneck. 3. Bring 19 existing blow offs above grade with wharf hydrants.	WC	CC	250,000	1,450,000									1,700,000

#	Project Number[1]	Project Name	Project Description	Fund[2]	Project Type[3]	Fiscal Year Budget (Dollars)										
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Ten-Year Total
5	EN20057	RP-4 Process Improvements Phase II (James Spears)	Reconfigure influent pump station structure and update pumps and equipment; replace deteriorated gates; replace blowers and make electrical and control upgrades and improvements	RO	CC	500,000	4,000,000	3,500,000	0	0	0	0	0	0	0	8,000,000
6	EN22034	RP-1 and RP-4 Generator Control Panel Retrofit/Modernization (James Simpson)	New state of the art digital control panels and CAT digital voltage regulators shall be installed for RP-1 Generator. Please see attached project scope and quotation for detailed job scope	RO	OM	180,000	0	0	0	0	0	0	0	0	0	180,000

(1) Project Number – from Ten-Year Capital Improvement Project; Final Capital Project List 03-17-2014
(2) Project Fund – Administrative Services (GG), Non-Reclaimed Water (NC), Regional Composting Authority (RM), Ground Water Recharge (RW), Recycled Water (WC), Regional Capital (RC), Regional O&M (RO), or Water Fund (WW)
(3) Project Type – Capital Construction Project (CC), Capital Major Equipment Project (EQ), Operations & Maintenance Project (OM), Reimbursable Project (RE), or Capital Replacement Project (RP)

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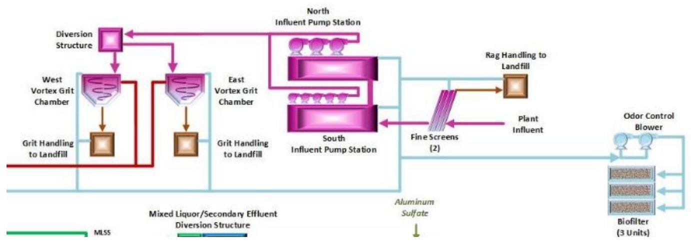
Asset Management System Summary – RP-4
Preliminary Treatment Process
1. Asset Profile



Influent Channel
Raw wastewater enters the plant through a 42-inch gravity sewer pipeline. A composite sample and other instrumentation are used to monitor the plant's influent flow, which establishes the official influent monitoring control point for the treatment plant.

Screening Equipment
Influent flow is diverted into two channels. Both channels are equipped with a mechanical rake and rigid bar screen. These units remove all solids before the solids enter the treatment plant. Screened solids are washed, compacted, and conveyed to a waste storage bin to await landfill disposal.

Screening Conveyance/Disposal System
Screening collected by the bar screens is transported by a conveyor and dropped into a washer compactor. The washer compactor reduces the organics on the screenings before discharging into a hauling bin.

Influent Pump Station
The screened wastewater enters the south influent wet well and then flows into the north wet well. The southern influent pump station is equipped with five dry-mount pumps, and the north influent pump station is equipped with two submersible pumps with a standby unit. Both influent pump stations lift screened wastewater into a common pipeline, which enters the headworks flow diversion structure.

The lifted flow enters the common pipeline, equipped with a magnetic flow meter that records the daily flow through the plant. The common pipeline has a flow meter bypass for flow meter maintenance. Metered flow enters two diversion structures where gates regulate flow through the grit removal system.

Vortex Grit System
The metered flow is diverted into two separate grit-removal systems. Each grit-removal system is equipped with a vortex grit chamber and classifier. Grit and other inorganic material are removed before entering the primary treatment process. The material is conveyed to a waste storage bin to await landfill disposal.

Grit Washing/Disposal System
Grit pumped from the vortex grit chamber is routed to two grit classifiers, where organic matters are removed from the grit. The grit sinks to a submerged inclined screw and moves up the ramp while being washed. The organic rich liquid from the grit classifiers is directed back to the liquid handling stream.

Odor Control System
The foul air is extracted from the influent screening enclosure, influent pump stations, the grit-removal vortex chambers, the grit-waste storage bins, and the primary clarifiers and conveyed to the media biofilters to remove odorous compounds. The odor control system is equipped with two blowers and three biofilters.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Preliminary Treatment Process	16.1 MGD	
Influent Channel Sewer	 42-inch	
Screening Equipment Fine Screen Gates	 2 @ 36.0 mgd each 3 hp each 4 units	 Peak
Influent Pump Station Pumps Valves Influent Flow Meter Valves	 3 @ 6,000 gpm 100 hp 5 @ 3,275 gpm 50hp 8 units 1 @ 48.3 mgd 3 units	 Per Unit Per Unit > 12-inch
Vortex Grit System Paddle Drive Pump Gates	2 @ 16.1 mgd 2 @ 1.5 hp 2 @ 250 gpm 10 hp 8 units	Per Unit Per Unit Per Unit
Grit Washing & Disposal System Classifier	 2 @ 50 gpm 5 hp	
Screening Conveyance & Disposal System Conveyor Washer Compactor	 3 hp 150 ft^3/hr 1 @ 5 hp	
Odor Control System Foul Air Fan Biofilter Pump Valves	 2 @ 12,500 scfm 30.8 hp 3 @ 5,011 ft^3 2 @ 214 gpm 3 hp 10 units	 Per Unit Per Unit Per Unit > 18-inch

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Influent Channel	1	3	2	2
Screening Equipment	1	2	2	2
Screening Conveyance/Disposal	2	4	3	3
Influent Pump Station	3	3	3	4
Vortex Grit System	3	3	3	3
Grit Washing/Disposal System	3	2	3	3
Odor Control System	3	3	3	3

* These ratings are defined in Appendix A

4. Key Issues for Further Investigation

Influent Channel
Piping into headworks showed signs of moderate deterioration, but does not require immediate attention, as noted in the March 2015 HDR Condition Assessment Report.

The influent manholes are showing signs of deterioration. The piping conveyance needs to be evaluated as surcharging of influent manholes is observed. A project is needed to further investigate the hydraulics.

Screening Equipment
The Multi-rake barscreens have excellent solids capture efficiency. However, the washer/compactor is undersized and experiences seldom failures and overflowing.

Influent Pump Station
Large quantity of material was removed from both wet wells during Project EN09021. There was difficulty accessing the south pump station without the entire headworks being taken offline. A potential project is needed to add inspection manholes and add coarse bubble mixing to both influent wet wells.

The southern 5 pumps are difficult to maintain and are approaching the end of their useful life.

Both wet wells showed signs of moderate deterioration, but does not require immediate attention, as noted in the March 2015 HDR Condition Assessment Report.

A potential project is needed to address these issues.

The current 42" influent flow meter and conveyance pipe is oversized and allows for grit and debris settling. A further project is in placed to evaluate and potentially replace the influent flow meter and pipe with a smaller size unit.

Vortex Grit System
No issues require special attention.

Grit Washing/Disposal System
No issues require special attention.

Screening Conveyance/Disposal System
No issues require special attention.

Odor Control System
An air balance was not performed on the new headworks handling building. In addition, the new air louvers need to be braced open to supply air exchange. Further evaluation of this system is needed to address these issues. A potential project may be needed.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Influent Channel	1997	
Screening Equipment	1997 2002 2020	Planned 2025
Influent Pump Station	1997 2009	
Influent Flow Meter	2009	
Vortex Grit System	1997 2009	
Grit Washing/Disposal System	1997 2009	
Screening Conveyance & Disposal System	1997 2009	
Odor Control System	2009 2012	

* Appendix B – Condition Assessment Reports

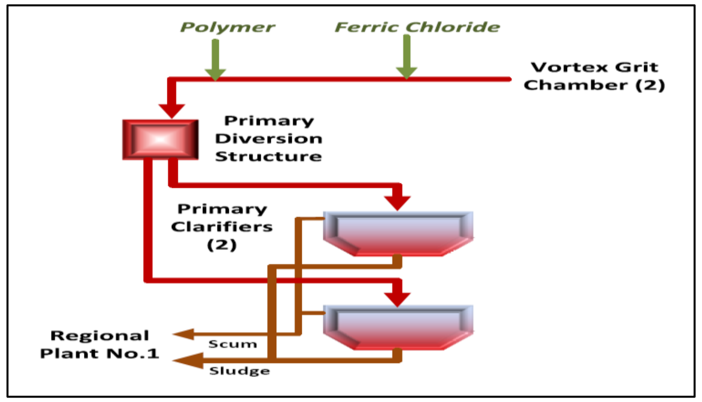
Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – RP-4

Primary Treatment Process

1. Asset Profile



Primary Diversion Structure
The preliminary treated flow enters a common 54-inch pipeline and is conveyed to the primary diversion structure. The flow is equally distributed into two 36-inch pipelines, each feeding a circular primary clarifier.

Ferric Chloride System
Ferric chloride is dosed into the raw wastewater before screening. The chemical is used to remove phosphorous and to improve the settling/removal characteristics within the primary clarifiers.

Primary Clarifiers
The facility is equipped with two covered primary clarifiers. The treatment process removes settable solids and floatable scum and grease. There is no solids-handling at RP-4; therefore, all the settled and floatable solids are introduced back into the trunk sewer downstream of RP-4, where they can be processed at RP-1. Solids are wasted out of the clarifier by gravity through actuated valves. Each clarifier is equipped with a flow meter to monitor all solids wasted from the primary treatment process. Primary effluent is conveyed through a 54-inch pipeline.

Sludge/Scum Wasting System
The solids which settle and thicken into sludge are gently mixed by the rotating rake arms on the bottom of the primary clarifiers; this process releases gas bubbles and allows the sludge to compact. A pipe conveys sludge by gravity into the trunk sewer to RP-1; all wasted sludge is recorded by flow meter and automatic control valves. The solids that float and thicken into scum are skimmed into scum beach and stored in a small wet well. A pipe conveys scum by gravity into the trunk sewer to RP-1.

2. Asset Profile

Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Primary Treatment Process	14 MGD	
Primary Diversion Structure Gates	3 units	
Ferric Chloride System Pump Chemical Tank	2 @ 53.1 gph 8,000 gallons	Per Unit
Primary Clarifier Drive	2 @ 1,617 gpd/ft^2 8,660 ft^2 0.33 hp	Per Unit
Sludge/Scum Wasting System Scum Valves Sludge Valves Actuated Sludge Valves	2 units 6 units 2 units	6-inch > 6-inch

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Primary Diversion Structure	2	2	2	2
Ferric Chloride System	2	3	3	3
Primary Clarifiers	1	1	1	1
Sludge/Scum Wasting System	2	3	3	2

* These ratings are defined in Appendix A

4. Key Issues for Further Investigation

Primary Diversion Structure
No issues observed.
Project EN17110 rehabilitated the concrete, installed larger inspection hatches for cleaning, replaced influent gates, and addressed the concrete corrosion.

Project EN20057 will improve the odor control removal for the primary diversion structure.

Ferric Chloride System
No issues observed.

Primary Clarifiers
The corroded structures in both primary clarifiers were rehabilitated under Project EN17110.

Primary Sludge/Scum Wasting System

Project EN17040 installed new flow meters, actuated valves, and modified piping to provide more accurate reading. New air reliefs were also installed to keep flow steady.
Pending response from Compliance to determine whether a primary scum flow meter is required.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Primary Diversion Structure	2009	Planned 2020
Ferric Chloride System	2009	NA
Polymer System	2009	NA
Primary Clarifiers	2009	1: Planned 2025 2: Planned 2025
Sludge/Scum Wasting System	2009	

* Appendix B – Condition Assessment Reports

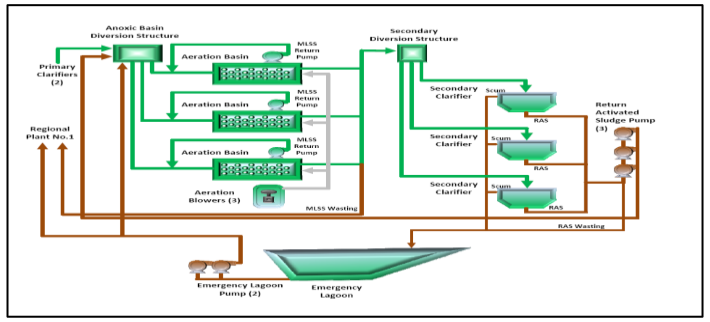
Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – RP-4

Secondary Treatment Process

1. Asset Profile



Anoxic Basin Diversion Structure
Primary effluent enters the anoxic basin diversion structure and is mixed with return activated sludge in this structure. The combined flow then enters each of the three anoxic basins via manually controlled diversion gates.

Anoxic Basin
One anoxic basin is designated for each of the three activated sludge treatment systems. Each system is composed of an anoxic basin and an aeration basin. The anoxic basin is equipped with three mixers to keep solids in suspension throughout the basin. The mixed liquor suspended solids at the end of the aeration basin is returned to the anoxic basin for treatment. The anoxic basin effluent is diverted through launders into two 30-inch pipelines, which equally feed both aeration basin trains.

Activated Sludge System
An aeration basin is designated for each of the three activated sludge treatment systems. The basins are divided into two trains, and each train is further subdivided into four zones: an extended anoxic zone, oxic zone, another anoxic zone, and another oxic zone. Each zone provides the correct biological environment to consume carbonaceous waste, breakdown ammonia, and reduce pathogens in the mixed liquor. The anoxic zones are equipped with mixers to ensure the solids remain in suspension throughout the treatment process. The oxic zones are equipped with fine-bubble-air diffusers. The diffused air supports the biological process and also provides mixing within the zone. A submersible mixed-liquor return pump is strategically placed at the end of the first oxic zone to recycle flow to the anoxic basin for more efficient treatment and nitrate removal. The treatment system is equipped with four blowers to provide pressurized air to the oxic zones. Typically only one or two blowers are needed during the day for the treatment process.

Mixed Liquor Diversion Structure
The mixed liquor enters a common 66-inch pipeline, which feeds the bottom of the mixed liquor diversion structure. The flow is then split equally through three launders, and each launder feeds a secondary clarifier through a 48-inch pipeline.

Secondary Clarifiers
The facility is equipped with three secondary clarifiers. The secondary treatment process provides an environment for the gravity separation of solids from the mixed liquor. The clarified secondary effluent exits the clarifier through a 48-inch pipeline. Scum accumulated on the surface of each of the secondary clarifiers is wasted either to RP-1 or the emergency lagoon. The settled solids are referred to as activated sludge. The activated sludge is recycled to the anoxic basin diversion structure through the return activated sludge pump station. The return activated sludge (RAS) pump station is equipped with three pumps and has a common 24-inch suction pipeline from each secondary clarifier. To control the population of biological species, activated sludge can be wasted from the common effluent pipeline from the aeration basin; wasted activated sludge is diverted to RP-1 for further treatment.

Return Activated Sludge (RAS) Pumping System
The RAS pumping system is designed to return the settled biomass in the secondary clarifiers to the head of the activated sludge system. The system is designed to pump at a rate of 30 to 100 percent of the full average daily flow of the facility.

Waste Activated Sludge (WAS) Station
The WAS station is designed to remove the excess biomass from the activated sludge system. Biomass can be removed as mixed liquor suspended solids (MLSS) from the common aeration basin effluent pipeline or from the discharge of the RAS pumping system. MLSS is wasted directly to the trunk sewer, which is treated at RP-1. Wasted RAS can be discharged to either RP-1 or the emergency lagoon.

Emergency Lagoon
The emergency lagoon is located at the southern end of the plant. The primary function of the lagoon is to recycle the filter effluent backwash from the trident filters and aqua aerobics filters. plant drainage is also diverted to the lagoon. The recycled flow is pumped into the anoxic basin diversion structure or can be diverted to Regional Plant No.1

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Secondary Treatment Process	14.0 MGD	
Anoxic Basin Diversion Structure Gates	6 units	
Anoxic Basin Mixer Gates	3 @ 7.0 MGD 3 @ 6.2 hp 6 units	Per unit Per Unit
Activate Sludge System Blowers Blower Valves Trains Depth Mixers Disc Air Diffusers Valve Valve (air) MLR Pump MLR Valve	3 @ 7.0 MGD 4 @ 8,000 scfm 400 hp 13.07 psig 6 units 6 @ 1,54 MG 15.7 ft 6 @ 4 hp 2400 per train 1 per train 6 units 6 @ 14,800 gpm 40 hp 6 units	Per Unit Per Unit >14-inch Per Unit Per Unit > 18-inch > 12-inch Per Unit >30-inch
Mixed Liquor Diversion Structure Gates	3 units	
Secondary Clarifier	3 @ 848 gpd/ft^2 16,500 ft^2	
RAS Pumping System Pump Valves	3 @ 6,076 gpm 75 hp 15 units	Per unit > 18-inch
WAS Station Valves	3 units	6-inch
Emergency Lagoon Pump Valves	1 @ 4.0 MG 2 @ - 3,155 gpm 75 hp 2 units	Per unit > 16-inch

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Anoxic Basin Diversion Structure	3	3	3	3
Anoxic Basin	3	3	4	3
Activated Sludge System	3	1	3	3
Mixed Liquor Diversion Structure	3	3	3	3
Secondary Clarifiers	2	2	2	2
RAS Pumping System	3	4	4	3
WAS System	3	3	3	3
Emergency Lagoon	2	2	2	2

* These ratings are defined in Appendix A

4. Key Issues for Further Investigation

Anoxic Basin Diversion Structure
No issues require special attention.

Anoxic Basin
No issues require special attention.

Activated Sludge System
Project EN17110.03 replaced all aeration diffusers in the aeration basins and portions of the air distribution piping. The walls between the trains are reinforced with counterforts for structural improvements.

Project EN17110 installed four (4) new Neuros Turbo blowers that supply process air to the aeration basins

Project EN25007 will replace all air control valves on the aeration basins to provide better communication with SCADA. The existing communication system have compatibility issues.

The mixed liquor return pump VFDs were installed during the expansion in 2000 and are experiencing failures. VFD for MLR pump 5 is out of service and interlocked VFD for MLR pump 6. There is an project to address the VFDs agency-wide.

Mixed Liquor Diversion Structure
No issues require special attention.

Secondary Clarifier

Project EN17110 installed walkable launder covers to all secondary clarifiers to prevent algae growth, All three (3) secondary clarifiers were rehabilitated and new drain valves were installed. In addition, a secondary scum pumping station is installed for redundant use.

RAS Pumping System
Project EN17110 provided the ability to waste RAS directly to the sewer and valving to the lagoon when needed.

Project EN25007 will provide a new redundancy RAS pump. It will also look at the piping configuration to improve operational flexibility to return activated sludge back to the aeration basins.

WAS Station
MLSS is wasted by selecting a fixed duration per hour to remove solids from the secondary system via a control valve (plug valve) near train 5. The existing control valve and programming does not provide the capability to set a constant flow rate. The air reliefs for the system are plumbed to the effluent stand pipe in train 6 to capture any discharged solids.

WAS may also be wasted from the RAS line as an alternative. The control valve may be set to Position or Flow Mode. Both utilize a waste schedule controlled by selecting a fixed duration per hour.

Emergency Lagoon
Project EN17110 installed two new submersible pumps, actuated valves,, flowmeter, and instrumentation in 2021.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Anoxic Basin Diversion Structure	2009	
Anoxic Basin	1997 2009	Planned 2027 and 2029
Activated Sludge System	1997 2003 2009	Planned 2026 and 2027
Mixed Liquor Diversion Structure	2009	
Secondary Clarifiers	2009	Planned 2028
RAS Pumping System	2009	
WAS Station	2009	
Emergency Lagoon	1997	

* Appendix B – Condition Assessment Reports

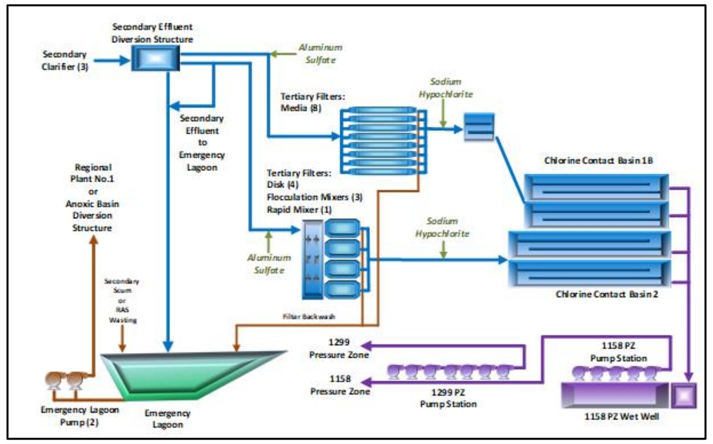
Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – RP-4

Tertiary Treatment Process

1. Asset Profile



Secondary Effluent Diversion Structure
The secondary effluent structure is fed through the bottom by a 66-inch pipe. Flow can be diverted to three different locations: the Trident media filters, Aqua-Aerobics Disk filters, or the emergency lagoon. The Trident media filters are fed by a 36-inch pipe, the cloth filters are fed by a 48-inch pipe, and a 48-inch pipe is used to bypass flow to the emergency lagoon. A 30-inch pipe connects the Aqua-Aerobics system to the 48-inch bypass pipe.

Aluminum Sulfate (Alum) System
Chemicals can be added to the secondary effluent that is feeding either filtration system for the purpose of coagulation or pre-filter disinfection. Alum is stored in the maintenance building in two bulk storage tanks and at the trident filter building in two smaller transfer tanks. Bleach is stored in three bulk storage tanks in the maintenance building and is typically applied to the chlorine contact basin

Filters (Trident and Aqua-Aerobics)
The filtration systems consist of two different technologies: the Trident Anthracite Media Filters and the Aqua-Aerobics Disk Filters. Both technologies filter solids from the secondary effluent before undergoing their separate disinfection systems. The Trident filter must not exceed a filter loading rate of five gallons per minute per square foot (gpm/ft^2), and the Aqua-Aerobics filter cannot exceed a filter loading rate of six gallons per minute per square foot (gpm/ft^2). The Trident-filtered effluent feeds Chlorine Contact Basin 1A through a 36-inch pipe, and the Aqua-Aerobics-filtered effluent feeds Chlorine Contact Basin 2 through a 48-inch pipe.

Chlorination System
Disinfectant chemical, in the form of 12.5 percent solution sodium hypochlorite (bleach), is dosed to the filtered effluent at both locations: Chlorine Contact Basin 1A and Chlorine Contact Basin 2. The chlorine dose typically ranges from 5 to 15 milligrams per liter. The bleach is intimately mixed into solution using a mixer at the influent of both chlorines contact basins. Bleach is stored in three bulk storage tanks in the maintenance building.

Chlorine Contact Basins (CCB)
The facility is equipped with two chlorines contact basin systems. The Trident-filtered effluent feeds into a coupled chlorine contact basin consisting of Chlorine Contact Basin 1A and 1B, and Aqua-Aerobics-filtered effluent feeds into Chlorine Contact Basin 2. The chlorine contact basin effluent is required to meet California Department of Public Health's Title 22-approved disinfection contact time of 450 milligrams-minutes per liter and a modal contact time of 90 minutes to discharge into the recycled water distribution system. The final effluent is pumped into the recycled water distribution system; therefore, the final effluent does not need to be dechlorinated at RP-4.

Free Chlorine analyzers were installed at both CCB1 and CCB2 in 2022 to comply with Free Chlorine Disinfection Tier 1 requirements from Division of Drinking Water for groundwater recharge purposes.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Tertiary Treatment Process	14.0 MGD	
Secondary Effluent Diversion Structure		One (1) Future
Gates	3 units	
Motorized Gates	2 units	
Alum System		
Tank	2 @ 2,200 gallons	Per unit
Transfer Tank	2 @ 400 gallons	Per unit
Transfer Pump	2 @ 90 gph	Per unit
Pump		
Trident Filters	2 @ 17.2 gph	Per unit
Aqua Filters	2 @ 17.2 gph	Per unit
Trident Filters		
Absorption Clarifier	8 @ 11 gpm/ft^2 140 ft^2	Per unit
Media Filter	8 @ 5 gpm/ft^2 313 ft^2	Per unit
Backwash Pump High Rate	2 @ 4,200 gpm 100 hp	Per unit
Backwash Pump Low Rate	2 @ 1500 gpm 15 hp	Per unit
Backwash Blower	2 @ 1120 scfm 30 hp	Per unit
Valves	16 units	> 18-inch
Aqua Disk Filters	4 @ 5.8 gpm/ft^2 646 ft^2	Per unit
Rapid Mixer	1 @ 5 hp	
Flocculation Mixer	3 @ 1 hp	Per unit
Backwash Pump	8 @ 200 gpm 3 hp	Per unit
Helical Gear Drive	4 @ 15,597 lb.-inch ¾ hp	Per unit
Gates	3 units	
Valves	4 units	> 18-inch
Chlorination System		
Tank	2 @ 9,500 gallons	Per unit
Pump		
Trident Filters	1 @ 100 gph	
Disk Filters	1 @ 100 gph	
RAS Pipeline	1 @ 100 gph	
CCB1A	2 @ 100 gph	Per unit
CCB2	2 @ 100 gph	Per unit
Water champ Mixer	2 @ 30 gpm 7.5 hp	Per unit
Chlorine Contact Basin		
CCB1A & 1B	7.0 MGD 1.15 MG	T22 Report
CCB2	7.0 MGD 1.01 MG	T22 Report
Gates		
CCB1A	1 units	
CCB1B	2 units	
CCB2	2 units	
Valves CCB1B	1 units	> 18-inch

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Secondary Effluent Diversion Structure	2	2	2	2
Alum System	3	3	4	4
Trident Filters	3	2	2	2
Aqua-Aerobics Disk Filters	3	3	3	3
Chlorination System	2	2	2	2
Chlorine Contact Basin	5	3	3	3
Effluent Diversion Structure	3	3	3	3

* These ratings are defined in Appendix A

4. Key Issues for Further Investigation

Secondary Effluent Diversion Structure
A leak has been identified on the structure. A condition assessment should be performed to determine a course of action.

Alum System
Project EN25007 will replace the existing alum injection lines to the filters and add access points along the injection lines for process troubleshooting and line cleaning. Additionally, the day tanks at the trident filter room will be demolished and alum will be fed directly from a centralized location.

Trident Filters
The absorption media and filter media are routinely replaced by maintenance staff. Multiple backwash, effluent, and waste valves do not isolate completely, flow is wasted to the lagoon and recirculated within the plant, many actuators leak air or are no longer utilized, and anthracite is found in the anoxic basin. A complete retrofit is required. Project EN17110 will address this issue.

Project EN17110.01 completed a comprehensive rehabilitation of the trident filters in 2019. However, the retainer grating and mesh at the clarification zones were not replaced and are corroding away. A project request form will be submitted to replace the aluminum gratings and mesh to protect the loss of absorption media. Additionally the project will also replace damaged seals that caused process water leakage.

Aqua-Aerobics Disk Filters
The fabric covers for the aqua disk filters protects the instrumentation and equipment from sunlight. However, the fabric covers are costly to replace and is susceptible to wind damage. EN20057 will design and construct a sturdier shade structure for the aqua disk filters.

Chlorination System

Project EN14018 addressed the issues within the chlorination system in 2018 The chlorine inspection vault covers are not rated for traffic and are showing signs of failure. EN20057 will replace damaged vault covers with new traffic rated covers.

Chlorine Contact Basin (CCB)

The concrete covers on the top the CCB are failing structurally and need to be replaced. Several covers are showing signs of severe cracks and corrosion. Project EN21041 will replace all CCB covers at both of the CCBs. Additionally, the project will also provide a passive overflow at the Recycled Water wet well immediately downstream of the CCBs.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Secondary Effluent Diversion Structure	2009	
Alum System	1997 2009	
Trident Filters	1997	Planned 2023 and 2024
Aqua-Aerobics Disk Filters	2009	
Chlorination System	2003 2009	
Chlorine Contact Basin	2003 2009	
Effluent Splitter Box	2003	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
Tertiary	RP-4 Process Structure Covers Replacement	It is recommended to install new covers made of sturdy materials for the chlorine storage station and aqua disk structure. 1. Evaluate the structural integrity of the existing support frame for the new cover. 2. Remove existing fabric covers, and install new covers made of sturdy material that is capable of withstanding the wind load at RP4.
Filters	RP-4 Trident Filter Clarification Zone Rehabilitation	It is recommended to replace/install the following items to rehabilitate/restore proper function of the trident filters. 1. Replace all aluminum gratings and meshes at the clarification zone of the trident filter with a compatible grating material, such as stainless steel or fiberglass. 2. Inspect, clean, and repair/replace clarification zone media and piping as needed. 3. Repair wall penetration leaks at the filter influent pipe gallery. 4. Evaluate alternatives to trident filter waste gate limit switch or add protection to the instruments from water damage during flush cycle. 5. Repair seals and fill gaps for waste gates to prevent unintended leakage during normal operation.

Asset Management System Summary – RP-4
Auxiliary Systems
1. Asset Profile

Electrical System
The electrical energy to power the treatment facility is obtained from the local electrical grid (SCE) and from onsite energy generation (wind and emergency generators). The wind asset is owned and operated by private firms as part of power purchase agreements. The electrical feed from the grid is composed of a 12 kV feeder to the power panel switch gear, where transformers and switchgear are located to distribute electrical energy throughout the facility. A single line diagram of the RP-4 electrical system is shown in Appendix B.

Diesel emergency generators are used in the event of a power failure. One outside generator is located in the northern portion of the facility and supplies power to the preliminary, primary, secondary, and tertiary sections.

An extensive lighting system is needed to illuminate the facility during dark hours. Most lighting fixtures are equipped with light sensors to turn off when sufficient lighting is provided from the sun. Lighting units are inside each of the process buildings, on equipment walls, and along the roadways for safety.

Utility Water System
Utility water is used throughout the facility to clean, supply pump seal water, cool, dilute, flush clogged pipes, irrigate, and more. The system is supplied by the 1158-foot pressure zone pump station. The piping consists of several isolation valves and point-of-use connections.

Potable Water System
Potable water is used throughout the plant for restrooms, cooling, odor scrubber dilution water, fire suppression, and more. The system is supplied by three connections on 6th Street from the Cucamonga County Water Department. The system has several backflow devices to protect the drinking water system.

Instrumentation and Control System
An extensive array of instruments is used to monitor and control the processes at RP-4. Nearly all the processes at the plant are observed and controlled from a centralized SCADA system. Control wiring and local panels are provided at individual pieces of equipment, and control wiring transmits data to the main control centers.

Yard Piping
A substantial network of pipes is used to convey flows between unit processes. The material, sizes, and service conditions of these pipes vary widely.

2. Capacity Profile
Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Electrical System		
Utility Voltage	1 @ 12 kV	
Transformers	8 @ 12 kV to 480 V	
Switchgear	10 @ 12 kV	
Distribution	5 @ 480 V	MCCs
Generator	1 @ 2,000 kW 2,847 Bhp	
Wind Turbine	1 @ 1 MW	
Mounted Lighting	> 50 units	
Utility Water System		
Pipelines	Various sizes	
Pump Station	See *1158 Pressure Zone*	
Valves	2 units	6-inch
Potable Water System		
Backflow Devices	5 units	>2-inch
Valves	10 units	>2-inch
Instrumentation and Control System		
HMI Workstation	8 units	
PLC	7 units	
I/O Hub	5 units	
Radio Transmitter	1 unit	

3. Asset Ratings
Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Electrical System	3	3	3	3
Utility Water System	3	3	4	4
Potable Water System	3	3	3	3
Instrumentation and Control System	3	3	4	3
Yard Piping	3	3	3	3

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation
Electrical System
Project EN22035 will upgrade the back-up generator control panel and monitoring signals because it is obsolete and is no longer supported by the manufacturer.

Utility Water System
Project EN22XXX will add redundant utility water to the headworks area for screenings handling and washing.

Project EN17110 added new piping and flow meter to track in-plant water usage from the 1299 recycled water pump station.

Project EN21041 will design and construct a passive overflow line to take non-compliant water to the lagoon from the 1158 pump station wetwell, eliminating the need for manual valving and non-compliant water from backing up into upstream processes.

Potable Water System
No issues require special attention.

Instrumentation and Control System
Multiple control systems need to be optimized, including: DO control, activated sludge wasting, and influent pump control. The SCADA migration may address these concerns, or may need to address internally.

Yard Piping
No issues require special attention.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Electrical System	1993 1995 2001 2005	
Utility Water System	2002	
Potable Water System	1993 2003	
Instrumentation and Control System	1995 2001 2003 2005	
Yard Piping	1993 1995 2001 2005	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
HVAC	RP4 HVAC System Upgrades (various locations) No. FMXXX3	The RP-4 facility equipment has been in service for nearly 18years and engineered life cycle of commercial HVAC equipment is 15 years depending on run hours. This project consist of a few locations within RP-4. First, all HVAC units using R-22 refrigerant need to be replaced due to freon being phased out by the EPA and several units over 10 years old are due for replacement. Second, the Blower Building HVAC unit needs to be replaced with two ductless A/C systems due to R-22 refrigerant no longer available. Lastly, the PCC3 wall mounts A/C units need to be replaced with units installed on the ground with ducting leading into the existing building penetrations due to safety issues working on the equipment and considering the age (2004) of the equipment.

End of System Summary

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Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

Regional Water Recycling Plant No. 5

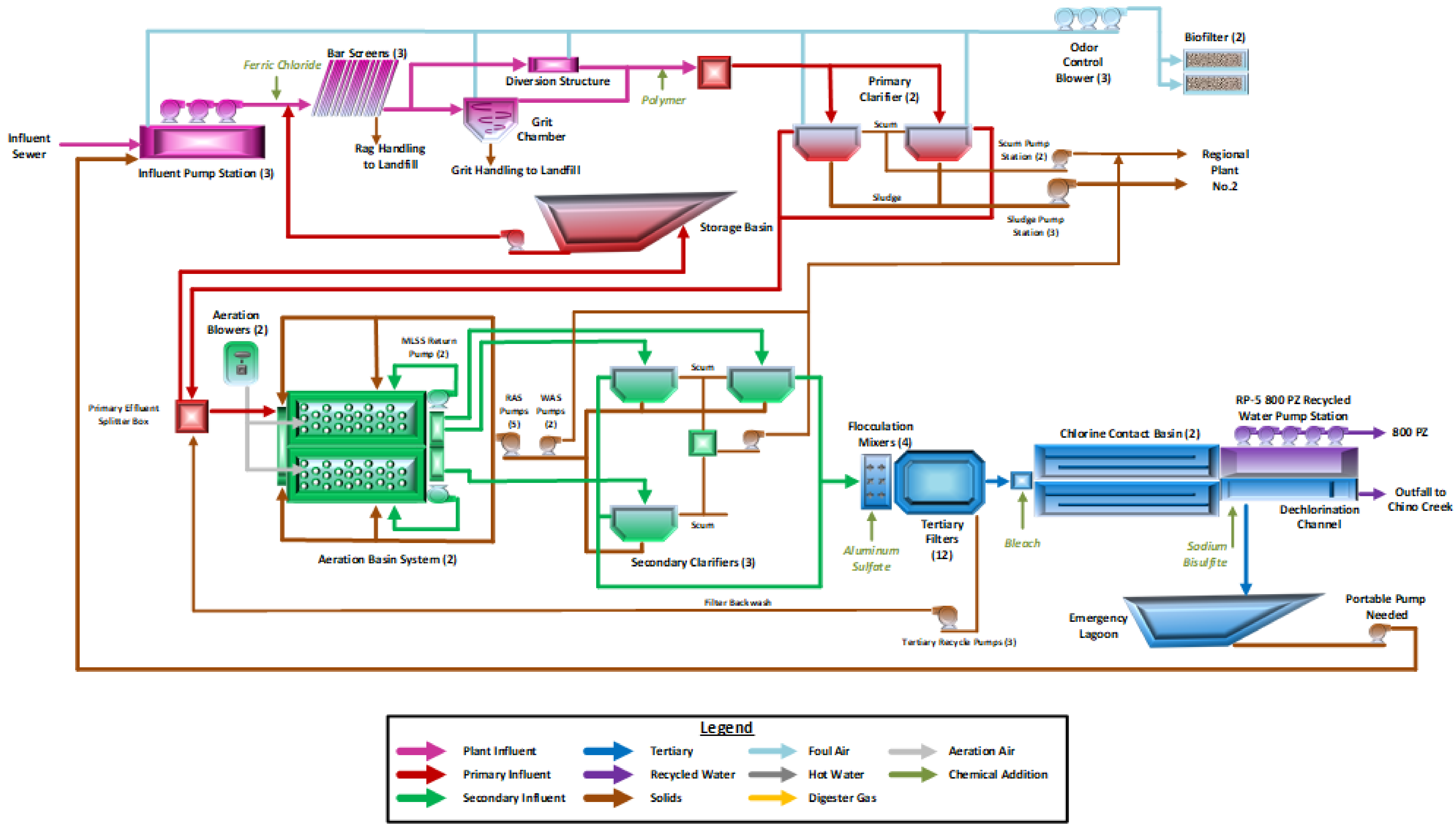

Figure 7-6: Regional Water Recycling Plant No. 5 (RP-5) – Schematic

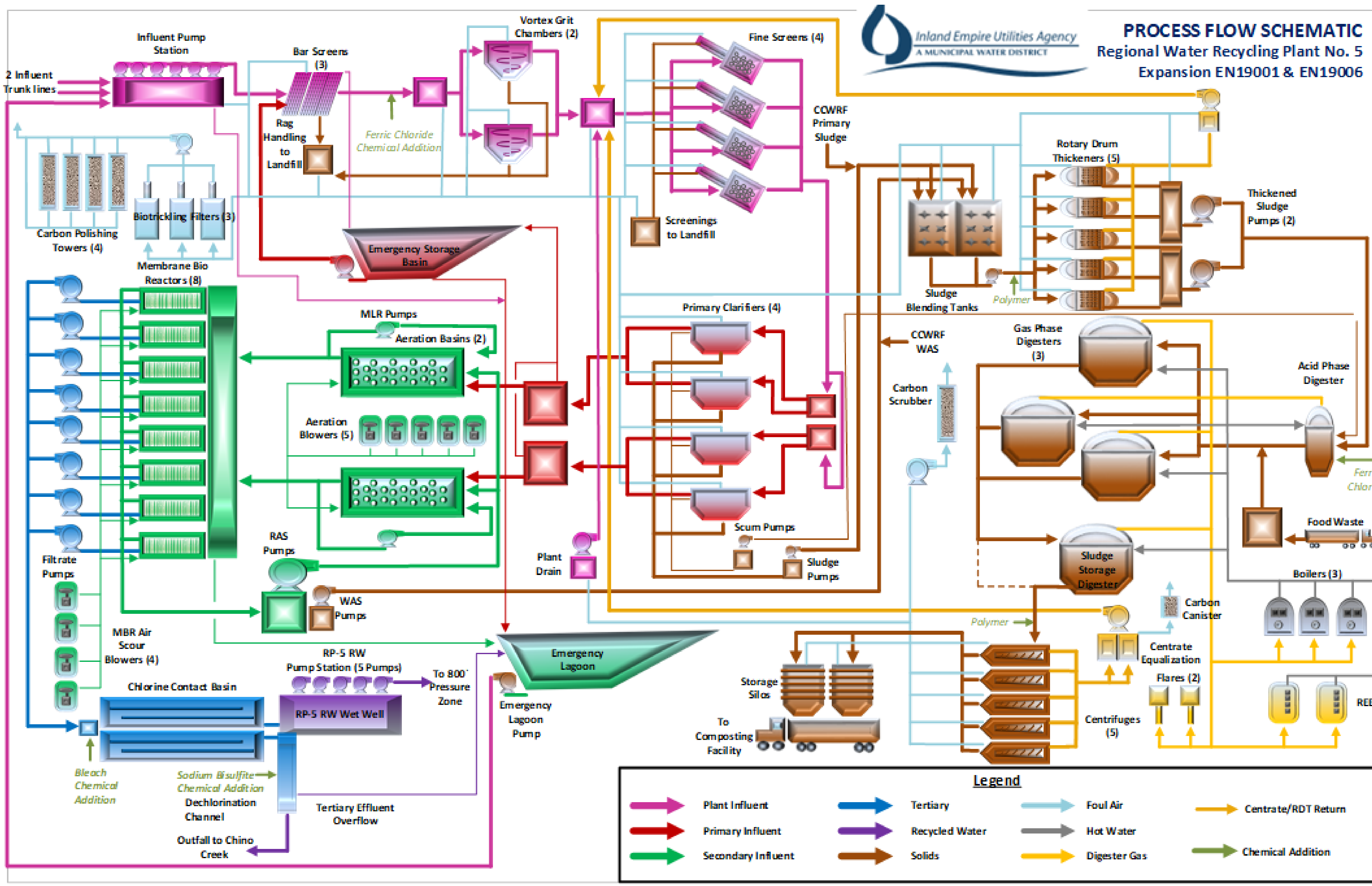
Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT
PROCESS FLOW SCHEMATIC
Regional Water Recycling Plant No. 5
Expansion EN19001 & EN19006
2 Influent Trunk lines
Influent Pump Station
Bar Screens (3)
Rag Handling to Landfill
Ferric Chloride Chemical Addition
Vortex Grit Chambers (2)
Fine Screens (4)
Screenings to Landfill
CCWRF Primary Sludge
Rotary Drum Thickeners (5)
Thickened Sludge Pumps (2)
Sludge Blending Tanks
Polymer
Carbon Polishing Towers (4)
Biotrickling Filters (3)
Membrane Bio Reactors (8)
Emergency Storage Basin
MLR Pumps
Aeration Basins (2)
Aeration Blowers (5)
Primary Clarifiers (4)
CCWRF WAS
Carbon Scrubber
Gas Phase Digesters (3)
Acid Phase Digester
Ferric Chloride
Food Waste
Sludge Storage Digester
Scum Pumps
Sludge Pumps
Plant Drain
RAS Pumps
WAS Pumps
Filtrate Pumps
MBR Air Scour Blowers (4)
RP-5 RW Pump Station (5 Pumps)
To 800' Pressure Zone
RP-5 RW Wet Well
Emergency Lagoon
Emergency Lagoon Pump
Chlorine Contact Basin
Bleach Chemical Addition
Sodium Bisulfite Chemical Addition
Dechlorination Channel
Tertiary Effluent Overflow
Outfall to Chino Creek
Storage Silos
To Composting Facility
Centrifuges (5)
Centrate Equalization
Carbon Canister
Flares (2)
Boilers (3)
REEP
Legend
Plant Influent
Primary Influent
Secondary Influent
Tertiary
Recycled Water
Solids
Foul Air
Hot Water
Digester Gas
Centrate/RDT Return
Chemical Addition

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Table 7-6: Regional Water Recycling Plant No.5 – Project Summary

#	Project Number[1]	Project Name	Project Description	Fund[2]	Project Type[3]	Fiscal Year Budget (Dollars)										
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Ten-Year Total
1	EN19001	RP-5 Expansion to 30 MGD (Brian Wilson)	Expansion of Influent Pump Station and new wet well. Headworks improvements: screens, grit chamber, fine screens, screenings/grit building. Two new primary clarifiers and four new primary clarifier covers. Improvements to the existing aeration basin including new diffusers and mixed liquor pumps. Demolish two secondary clarifiers and construction a 30 MGD MBR system. UV disinfection system. New centralized odor control system for solids and liquids. Emergency overflow and storm water system. New Mountain Avenue Lift Station and Modifications to Butterfield Ranch Pump Station	RC	CC	40,000,000	50,000,000	20,000,000	13,000,000							123,000,000
2	EN19006	RP-5 SHF – RO (Brian Wilson)	Based upon the major recommendations of the PDR, the RP-5 Liquids Expansion and the RP-5 Solids Treatment Facility, Project No. EN19001, will consistent of the following major components: Rotary drum thickening building for primary and secondary solids thickening. Phased digestion including acid phase digesters, methane digesters, and digested sludge storage. Digested sludge storage. Centrifuge dewatering building, biosolids cake storage, and centrate equalization. Digester gas treatment, digester gas flaring, and emissions control systems for the existing engines. Food waste receiving station and digestate transfer pump station at RP-5 Solids Handling Facility	RC	CC	67,000,000	30,000,000	15,000,000	0							112,000,000
3	EN23003	Central Plant Cooling Tower Replacement (Jamal Zughbi)		GG	CC	500,000	1,200,000	700,000								2,400,000

(1) Project Number – from Ten-Year Capital Improvement Project; Final Capital Project List 03-17-2014
(2) Project Fund – Administrative Services (GG), Non-Reclaimed Water (NC), Regional Composting Authority (RM), Ground Water Recharge (RW), Recycled Water (WC), Regional Capital (RC), Regional O&M (RO), or Water Fund (WW)
(3) Project Type – Capital Construction Project (CC), Capital Major Equipment Project (EQ), Operations & Maintenance Project (OM), Reimbursable Project (RE), or Capital Replacement Project (RP)

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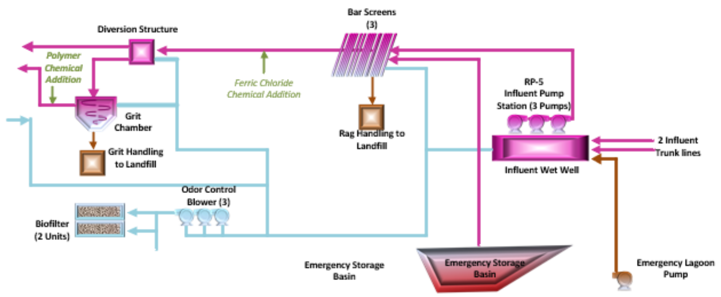
Asset Management System Summary – RP-5
Preliminary Treatment Process
1. Asset Profile



Influent Trunk Lines
Raw wastewater enters RP-5 through the 42-inch Chino interceptor diversion and 66-inch Kimball interceptor.

Influent Pump Station (IPS)
The influent pump station collects raw sewage from the 42-inch Chino interceptor diversion and 66-inch Kimball interceptor. The streams enter the influent junction box and flow through manually-operated isolation gates into two separate wet wells. The RP-5 influent pump station conveys plant influent flow to the headworks. Once lifted to the headworks, flow proceeds through the entire plant by gravity. Three VFD-controlled, wet-pit submersible, non-clogging, centrifugal pumps located in the IPS wet wells lift the combined flow and convey the raw sewage to the headworks through a 42-inch diameter discharge line. The west wet well holds two pumps, while the east wet well holds the third pump, with space for one future pump. A 36-inch-diameter magnetic flow meter in the combined discharge line measures the flow.

Screening Equipment
The headworks consist of bar screens with screenings washers and compactors and also grit basins with grit washers. Two mechanical climber-type bar screens are installed along with a screw conveyor and screenings washer/compactor. One manual bar screen is also installed as a standby unit.

Vortex Grit Chamber
When wastewater leaves the bar screen channels, it enters a mechanically induced vortex grit basin, which separates the heavier grit particles from the lighter organics. The heavier particles settle to the bottom of the chamber from where they are removed from the basin by the constant-speed recessed impeller grit pumps.

Grit Washing/Disposal System
The grit removal system separates grit, sand, and other heavy particles from lighter organics in the influent wastewater flow, removing this material to protect downstream equipment and processes. The fluidized grit is pumped to the grit washers, where it is dewatered before being discharged into disposal bins. The grit washers include a cyclone separator to remove additional water and concentrate the solids. They also contain a classifier mechanism that accepts the underflow from the cyclone unit. This classifier further separates the solids using a screw mechanism to transport the grit upward out of a settling tank.

The grit removal system includes manually operated gates and valves to allow for bypassing each component of the facility. The duty pump and duty grit washer are selected by opening the appropriate manually operated plug valves. There are provisions to accommodate the expansion of the grit removal system if needed. A second grit basin could replace the existing grit basin bypass pipeline, and a third pump can be added to the grit pumping station.

The excess liquid spills out of the grit classifiers and is directed back to the bar screen structure effluent channel.

Screening Conveyance/Disposal System
Screening collected by the bar screens is transported by a conveyor and dropped into a hydraulic washer-compactor. The compactor compresses the collected rags, squeezing out excess water, and pushes the rags to the roll-off bin.

Ferric Chloride System
Ferric chloride is added to the liquid flow after grit removal to increase solids capture during primary treatment and to control odors caused by hydrogen sulfides.

The ferric station consists of a truck filling station, 9,600-gallon storage tank, three chemical metering pumps and associated piping.

Polymer System
Polymer is added to the liquid flow before grit removal to enhance primary treatment. The polymer system includes two 500-gallon tote stands, chemical metering pumps, mixing chamber, and associated piping. The anionic polymer system is located in the same area as the ferric chloride system. The polymer system consists of two polymer storage totes and two polymer blenders. Anionic polymer is drawn from the storage totes, mixed and diluted with potable water, and delivered to the primary clarifier splitter box. Space and connections for future polymer blenders are provided to accommodate future plant flows.

Biofilter
Odors collected in the preliminary and primary treatment processes are forced through three biofilter media cells, where hydrogen sulfide gas is removed through biological processes.

2. Capacity Profile
Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Preliminary Treatment Process	16.3 MGD	
Influent Trunk Sewer Kimball Interceptor Chino Interceptor	 66-inch 42-inch	
Influent Pump Station Valves Influent Magmeter	3 @ 8,333 gpm 200 hp 7 units 1 @ 32-inch Dia.	Per Unit > 18-inch
Screening Equipment Mechanical Screen Manual Screens	 2 @ 30 MGD each 1 @ 30 MGD	Per Unit
Vortex Grit Basin Chamber Pump Gates	 1 unit @ 30 MGD 2 @ 250 gpm 25 hp 2 units	Per Unit
Grit Washing/Disposal Classifiers	 2 @ 13 ft³/hr	Per Unit
Screening Conveyance & Disposal System Conveyor Washer Compactor	 1 @ 5.0 hp 1 @ 32 ft³/hr	
Ferric Chloride System Tank Pumps	 9,600 gallons 2 @ 53 gph	Per Unit
Polymer System Pump	 2 @ 4.5 gph	Per Unit
Biofilter Cells Blowers	 2 @ 667 ft³ 3 @ 13,200 scfm 30 hp	 Per Unit Per Unit

3. Asset Ratings
Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Influent Trunk Sewer	3	3	3	3
Influent Pump Station	3	3	3	3
Screening Equipment	3	3	3	4
Vortex Grit System	3	3	3	3
Grit Washing/ Disposal System	3	3	3	3
Screening Conveyance/Disposal System	3	3	3	3
Ferric Chloride System	4	3	3	3
Polymer System	NA	NA	NA	NA
Headworks Splitter Box	2	3	3	3
Biofilter	3	3	3	3

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation
Influent Trunk Sewer
No issues require special attention.

Influent Pump Station
The influent pump station wet well accumulates floating debris which does not get pumped by the submersible pumps. The wet well needs routine Vactor cleaning, which is tedious and inefficient.

Screening Equipment
Fine screens are being considered to replace the current bar screens. The new fine screens will screen out smaller unwanted inorganics to pass through into the system, allowing for better and more efficient process treatment. Project EN19001 will address this issue.

Operations report that no interlock exists between IPS and bar screens channel level. Level overflows when bar screens fail and cause overflow in sumps with potential overflow into curbs and to Kimball Ave. Project EN19001 will address this issue with a new overflow structure to ESB.

Vortex Grit System
No issues require special attention

Grit Washing/Disposal System
No issues require special attention

Screening Conveyance/Disposal
No issues require special attention.

Ferric Chloride System
Ferric Tank is over 10 years old and needs inspection. This issue should be addressed by Maintenance.

Polymer System
To maximize the soluble BOD to the denitrification zone of the aeration basin, it is not recommended to for polymer addition in the future. The polymer system will be abandoned.

Biofilter
No issues require special attention, but routine media replacement is required to maintain facility air-quality compliance. A more efficient system should be installed to reduce frequent re-occurring media replacement.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Influent Trunk Sewer	2004	
Influent Pump Station	2004	
Screening Equipment	2004	
Vortex Grit Basin	2004	
Grit Washing/Disposal	2004	
Screening Conveyance & Disposal System	2014	
Ferric Chloride System	2004	
Polymer System	2004	
Biofilter	2004	

* Appendix B – Condition Assessment Reports

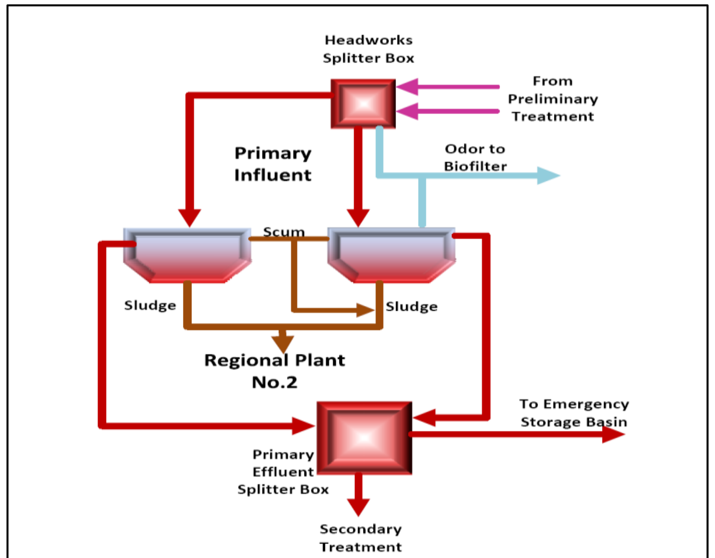
Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – RP-5

Primary Treatment Process

1. Asset Profile



Headworks Splitter Box
The headworks splitter box receives flow from the grit systems, bar screen channel, and the bar screens structure bypass. Distribution valves in this area direct the wastewater flow to Primary Clarifiers 3 and 4.

Primary Clarifiers
There are two circular primary clarifiers located north of the aeration basins at RP-5. Each covered clarifier is 100 feet in diameter, with a sidewall depth of 12 feet. The average surface overflow rate for each clarifier is 8.3 MGD, with a maximum of 15 MGD. The solids that settle out in the clarifiers are pumped to RP-2 for treatment. The clarified flow passes over a weir and into the aeration basins.

Primary Effluent Splitter Box
The primary effluent from the clarifiers flows into the primary effluent splitter box. The purpose of the splitter box is to allow diversion of the primary clarifier effluent to either the aeration basin or the emergency storage basin. The amount of flow directed to either structure can be adjusted from slide gates.

Sludge Pumping System
The primary sludge pump station pumps settled sludge from the primary clarifiers sludge hoppers to the solids handling facilities at RP-2. There are three primary sludge pumps: one dedicated to each primary clarifier and one that serves as a common standby. Each pump suction line contains a sludge grinder (Muffin Monster) to reduce the size of the pumped solids and help prevent plugging. Sludge withdrawal from each clarifier is controlled by adjustable pumping cycles to maintain a constant sludge blanket level within the clarifier.

Scum Pumping System
Scum arms with a skimmer mechanism remove scum from the clarifier water surface. Scum deposits into the scum beach and then flows by gravity into a main scum wet well that receives scum from both primary clarifiers. The scum well has a mixer to help ensure that the scum does not thicken and result in pumping difficulties.

Emergency Overflow Pond
The unlined 17 MG emergency storage basin (located downstream of the dechlorination basin at the end of the plant) can be used to store final plant effluent if the effluent does not meet the permit requirements. The basin does not have a permanent pumping facility, but it has the capability to return flow to the headworks through a 16-inch line with the use of temporary pumps. This same line can be used to divert flow (by gravity) from the influent pump station wet well to the emergency overflow pond in an emergency situation.

Emergency Storage Basin (ESB) System
Downstream of the primary clarifiers, there is a primary effluent box with an adjustable weir gate that can be used to divert flow to the 6.8 MG emergency storage pond. The weir gate is manually set such that primary effluent in excess of a selected flow rate goes over the weir gate into the lagoon. The effluent is then pumped back to the headworks when the influent rate is low enough to allow all flow to continue to downstream processes.

The Emergency Storage Basin Pump Station returns diverted primary effluent to the headworks-structure bar-screen influent channel. Three VFD-controlled, wet-pit submersible, non-clog, centrifugal pumps located in the wet well lift the diverted primary effluent and transmit it to the headworks through a 20-inch-diameter transmission line.

A variety of instruments is installed at the ESB pump station to collect data and control operation of the pumps. A 20-inch-diameter magnetic flow meter in the combined discharge line measures the combined discharge flow and transmits the information to the Supervisory Control and Data Acquisition (SCADA) control system. A level transmitter and high- and low-low level switches monitor the liquid level in the wet wells and provide information to control the pumps.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Primary Treatment Process	16.3 MGD	
Headworks Splitter Box Gates	 3 units	
Primary Clarifiers Drive Gates	2 @ 2,075 gpd/ft^2 7,854 ft^2 1 @ ¾ hp 2 units	Per Unit
Primary Effluent Splitter Box Gates	 2 units	
Sludge Pumping System Pumps	 3 @ 230 gpm 30 hp	 Per Unit
Scum Pumping System Pump	 2 @ 230 gpm 15 hp	 Per Unit
Emergency Overflow Pond	1 @ 17 MG	Unlined
ESB System Basin VFD Pumps	 1 @ 6.8 MG 3 @ 3,000 gpm 60 hp	 Per Unit

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Headworks Splitter Box	2	3	3	3
Primary Clarifiers	4	3	3	3
Primary Effluent Splitter Box	3	3	4	3
Sludge Pumping System	3	3	3	3
Scum Pumping System	3	3	3	3
Emergency Overflow Pond	4	3	4	3
ESB System	3	3	3	3

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

Headworks Splitter Box
No issues require special attention.

Primary Clarifiers
Condition assessment of the East primary clarifier revealed significant coating failure of metallic surfaces. It is recommended to repair the severely corroded areas on the skimmer arms and steel in the vapor space as soon as possible or the next maintenance interval. Project EN19001 will address this.

Primary Effluent Splitter Box
Modifications to the 12-foot weir gate and automation of the slide gate to allow flow to the aeration basin will better optimize the flow equalization of plant treatment process. Project EN19001 will address this. After Project EN19001 is completed under normal operation conditions this weir gate will not need to be modulated.

Sludge Pumping System
No issues require special attention.

Scum Pumping System
No issues require special attention.

Emergency Overflow Pond
Temporary pumps must be used to pump flows from the pond to the headworks. There are no operational impacts at this time, and will likely be addressed when a new RP-5 solids handling facility is built.

It is unknown whether the pond is intended as a containment system. A survey of historical record does not reveal whether compacted clay liner or geomembrane was used. The pond has 6 feet of accumulated solids. There are no operational impacts at this time, and will likely be addressed in the RP-5 Expansion. Project EN19001 will address this with a new pump station at EOP.

ESB System
No issues require special attention.

Table 3 History of Select Assets

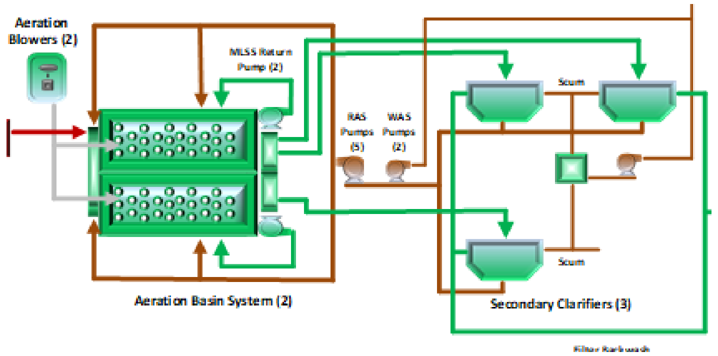
System	Capital Improvement Project Activity	Condition Assessment Report
Headworks Splitter Box	2004	
Primary Clarifiers	2004	Planned 2026 and 2027
Primary Effluent Splitter Box	2004	
Sludge Pumping System	2004	
Scum Pumping System	2004	
Emergency Storage Basin	2004	
ESB System	2004	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – RP-5
Secondary Treatment Process
1. Asset Profile



Activated Sludge System
The activated sludge system is two-stage biological-nutrient-removal suspended-growth system that provides biological treatment to convert soluble BOD to biomass able to settle. The activated sludge consists of biological processes that use dissolved oxygen to promote the growth of biological flocculation, which then removes organic material. The process converts ammonia to nitrites, nitrates, and ultimately nitrogen gas. There are two aeration basins (four trains) located south of the primary clarifiers. Each aeration basin contains eleven zones. Four zones in each basin are dedicated anoxic zones, and seven zones are available aeration zones.

The aeration zones are aerated via the Parkson air membrane system supplied by two single-stage centrifugal blowers with inlet/variable diffuser guide vanes and motorized butterfly control valves that control dissolved oxygen concentrations. Each aeration basin contains up to eight pairs of anoxic mixers to minimize solids settlement in anoxic zones. Influent gates divert a combined flow of primary effluent and return activated sludge available to feed three zones on each aeration basin. Each aeration basin contains a mixed liquor return pump in the effluent channel, which can be used to pump nitrate-rich mixed liquor back to the aeration basin, where denitrification can occur.

Secondary Clarifiers
Effluent flow from the aeration basins is transferred through 36-inch gravity pipelines into the secondary clarifiers (four in total) through the bottom of the center column. The flow then travels up into a feed well that contains a flocculation zone. The flow passes through diffusers in the side of the feed well and is directed toward the bottom of the clarifier by a baffle. Each clarifier has a rotating sludge and ducking skimmer arm to collect scum off the surface. The solids settle to the bottom of the clarifier and are either returned to the aeration basin or wasted to RP-2. The overflow effluent is directed through a 54-inch pipeline to the tertiary filters.

Return Activated Sludge (RAS) Pumping System
Some of the settled sludge in the secondary clarifiers is pumped back to the influent of the aeration system as return activated sludge (RAS) to mix with primary effluent, called mixed liquor suspended solids (MLSS). The RAS is returned to the aeration basin by the 5 RAS pumps to maintain the biological process.

Waste Activated Sludge (WAS) Pumping System
To control the excess biological concentrations in the aeration system, the settled solids from the secondary clarifiers are "wasted" and pumped out of the secondary system to solids processing as waste activated sludge (WAS). WAS is pumped to and treated at RP-2.

Scum Pumping System
Scum collected from the skimmer arm of the secondary clarifiers is routed to a scum well, where it is pumped out of the system to solids processing at RP-2.

2. Capacity Profile
Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Secondary Treatment Process	17.1 MGD	
Activated Sludge System	2 @ 17.1 MGD	
Blowers	2 @ 7,500 scfm 500 HP 11.5 psig	Per Unit
Trains	2 @ 5.16 MG	Per Unit
Panels	195	Per System
Depth	19 ft	
Mixers	20 @ 7.5 hp	
Gates	32 units	Per System
Valve	1 unit	Per System
MLR Pumps	2 @ 6,300 gpm	
Secondary Clarifiers	3 @ 356 gpd/ft^2 13,273 ft^2	Per Unit
Gates	4 units	
RAS Pumping System	5 @ 2,500 gpm	Per Unit
Valves	3 - 20-inch units	
WAS Pumping System	2 @ 100 gpm 7.5 hp	
Scum Pumping System	2 @ 600 gpm 15 hp	

3. Asset Ratings
Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Activated Sludge System	3	2	2	2
Secondary Clarifiers	3	3	3	3
RAS Pumping System	3	3	3	3
WAS Pumping System	3	3	3	3
Scum Pumping System	3	3	4	3

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation
Activated Sludge System
No issues require special attention.

Secondary Clarifiers
No issues require special attention.

RAS Pumping System
No issues require special attention.

WAS Pumping System
No issues require special attention.

Scum Pumping System
No issues require special attention.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Activated Sludge System	2004	
Secondary Clarifiers	2004	
RAS Pumping System	2004	
WAS Pumping System	2004	
Scum Pumping System	2004	

* Appendix B – Condition Assessment Reports

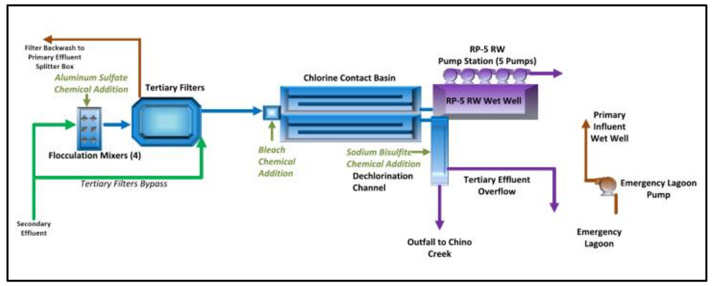
Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – RP-5

Tertiary Treatment Process

1. Asset Profile



Aluminum Sulfate (Alum) System
Alum is used with cationic polymer to provide flocculation upstream of the tertiary filters. The addition of these two chemicals should result in an increase in floc size, which will increase particulate removal by the filters. The alum system consists of a storage tank and two chemical metering pumps in a duty/standby mode of operation. Alum is drawn from the storage tank and pumped to the influent channel to the tertiary filters. Space and connections for an additional future tank and chemical pumps are provided to accommodate future plant flows.

Flocculation Tank
To provide optimum removal of particulates during the filtration process, chemicals are added at the flocculation tank at the influent side of the filters. There is one rapid mixer and four VFD-controlled flocculators at this site.

Filters
The Parkson continuous backwash tertiary filters provide physical treatment to remove suspended solids and lower the turbidity of the secondary effluent. There are twelve tertiary filters and a filter recycle pump station with three submersible pumps that return filter backwash to the primary effluent splitter box. The tertiary filters are located south of the secondary clarifiers. Each tertiary filter contains six 50-square-foot modules. Flow that enters the tertiary filters comes from the secondary clarifiers. Secondary effluent is injected with chemicals to aid with filtration in the rapid mix and flocculation basin. The effluent travels through three pipes, each of which provides influent to a group of four filters. Filter influent then travels through the filter feed valves and into each filter influent manifold, where it is distributed to the bottom of each module.

Chlorination System
The sodium hypochlorite system has multiple applications throughout the plant. The main purpose of the system is to provide disinfection of the plant effluent before final discharge. Hypochlorite (bleach) may also be used for housekeeping purposes. It can be added to the return activated sludge (RAS) to prevent the growth of filamentous organisms, which inhibit good settling in the secondary clarifiers. It can also be added to the secondary clarifier weirs and to the tertiary filter influent channel to prevent the growth of algae in these areas.

The sodium hypochlorite system consists of four storage tanks and three sets of chemical metering pumps. One set, consisting of five pumps, is used for disinfection. This set pumps hypochlorite to the chlorine mixer at the beginning of the chlorine contact basin. The second set of two pumps is used for RAS dosing and sends hypochlorite to the RAS line before the aeration basin. The third set of two pumps is used for algae control. This set pumps hypochlorite into a dilution water line and the mixture is sent to the secondary clarifier weirs and filter influent channel. Space and connections for future RAS and algae control chemical pumps are provided to accommodate future plant flows.

The filter recycle pump station consists of three submersible pumps, which return tertiary filter backwash to the primary effluent splitter box.

Chlorine Contact Basins
After flow passes through the tertiary filters, it enters the chlorine contact channels, where the water is chlorinated and then mixed to improve disinfectant contact and obtain the necessary compliance concentration and detention times. The chlorinated water then travels through a serpentine pattern of channels to recycled water demand or the dechlorination channel, where the chlorine is removed from the water before discharge to the outfall.

Dechlorination System
Flow entering the dechlorination structure is injected with sodium bisulfite (SBS) and travels through a serpentine flow path, allowing SBS to neutralize any chlorine residual before flowing into Chino Creek through a 48-inch effluent flow meter and out through an outfall 60-inch pipeline. SBS is stored in two large chemical tanks and is metered into the system via four chemical metering pumps.

The dechlorination basin final effluent gate is used to stop plant effluent flow to the outfall, if the final effluent flow does not meet water quality standards. The dechlorination basin final effluent gate is a motorized sluice gate. When it is closed, flow is diverted over a 23-foot-long, fixed, broad-crested weir and through a pipeline into the adjacent emergency lagoon.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Tertiary Treatment Process	16.3 MGD	
Alum System Tank Pumps	 560 gallons 2 @ 14 gph	 Per Unit
Flocculation Tank Rapid Mixer Mixer	 1@ 30 hp 1@ 3 hp 1@ 2 hp 1 @ 1.5 hp 1@ 1 hp	
Filters Filter Loading Recycle Pumps Gates	12 @ 300 ft^2 5 gpm/ft^2 3 @ 420 gpm 7.5 hp 1 units	Per Unit Per Unit
Chlorination System Tanks Pumps Water Champ Mixer	 4 @ 10,500 gallons 9 @ 77 gph 1 @ 20 hp 1 @ 30 hp	 Per Unit Per Unit
Chlorine Contact Basins Gates	2 @ 0.9 MG 4 units	Per Unit
Dechlorination System Tanks Pumps Gates	 2 @ 5,100 gallons 4 @ 53 gph 3 units	

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Alum System	4	3	4	3
Flocculation Tank	3	3	3	3
Filters	2	3	4	4
Chlorination System	3	2	2	2
Chlorine Contact Basins	3	3	3	3
Dechlorination System	3	3	3	3

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

Alum System
No issues require special attention.

Flocculation Tank
No issues require special attention.

Filters
The filters require significant maintenance. Project EN19001 will address this by removing the filters and replacing it with the new MBR system.

Chlorination System
No issues require special attention.

Chlorine Contact Basins (CCB)
No issues require special attention.

Dechlorination System
No issues require special attention.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Filters	2004 2009	Planned 2023
Alum System	2004	
Flocculation Tank	2004	
Chlorination System	2004 2010	
Chlorine Contact Basins	2004	
Dechlorination System	2004 2010	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – RP-5

Auxiliary Systems

1. Asset Profile

Plant Drain
The plant drain collects surface storm runoff, excess irrigation, and wash-down water collected in submersible drains located throughout the facility. The drain system receives gravity flows to a wet well, where the flow is then pumped and recycled toward the head of the treatment process.

Electrical System
The electrical energy to power the treatment facility is obtained from the local electrical grid (SCE) and from onsite energy generation (solar and emergency generators). The solar assets are owned and operated by private firms as part of power purchase agreements. The electrical feed from the grid is composed of a 12 kV feeder to the power panel switchgear, where transformers and switchgear are located to distribute electrical energy throughout the facility. A single line diagram of the RP-5 electrical system is shown in Appendix B.

Diesel emergency generators are used in the event of a power failure. Two generators are located at the south section and supply power to the preliminary, primary, secondary, tertiary sections, and headquarters

An extensive lighting system is needed to illuminate the facility during dark hours. Most lighting fixtures are equipped with light sensors to turn off when sufficient lighting is provided from the sun. Lighting units are inside each of the process buildings, on equipment walls, and along the roadways for safety.

Utility Water System
Utility water is used throughout the facility to clean, supply pump seal water, cool, dilute, flush clogged pipes, irrigate, and more. The system is supplied by the RP-5 RW pump station. The piping consists of several isolation valves and point-of-use connections.

Potable Water System
Potable water is used throughout the plant for restrooms, cooling, odor scrubber dilution water, fire suppression, and more. The system is supplied from a 6-inch W1 line off Kimball Ave. from the City of Chino. The system has several backflow devices to protect the drinking water system.

Instrumentation and Control System
An extensive array of instruments is used to monitor and control the processes at RP-5. Nearly all the processes at the plant are observed and controlled from a centralized SCADA system. Control wiring and local panels are provided at individual pieces of equipment, and control wiring transmits data to the main control terminals.

Yard Piping
A substantial network of pipes is used to convey flows between unit processes. The material, sizes, and service conditions of these pipes vary widely.
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2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Electrical System		
Utility Voltage	1 @ 12 kV	
Transformers	6 @ 12 kV to 480 V	
Switchgear	8 @ 12 kV	
Distribution	3 @ 480 V	MCCs
Generator	2 @ 1,000 kW	
Mounted Lighting	> 50 units	
Utility Water System		
Pipelines	Various sizes	
Pump Station	2 @ 1,925 gpm 3 @ 1,925 gpm	
Valves	30 units	
Potable Water System		
Backflow Devices	>25 units	
Valves	>25 units	
Instrumentation and Control System		
HMI Workstation		
RTU		
PLC		
I/O Hub		
Radio Transmitter	1	

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Plant Drain	3	3	3	3
Electrical System	3	3	3	3
Utility Water System	3	3	3	3
Potable Water System	3	3	3	3
Instrumentation and Control System	2	2	2	3
Yard Piping	3	3	3	3

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

Plant Drain
No issues require special attention.

Electrical System
No issues require special attention.

Utility Water System
No issues require special attention.

Potable Water System
No issues require special attention.

Instrumentation and Control System
No issues require special attention.

Yard Piping
No issues require special attention.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Plant Drain	2004	
Electrical System	2004	
Utility Water System	2004	
Potable Water System	2004	
Instrumentation and Control System	2004	
Yard Piping	2004	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
REEP	REEP Return to Service Capital No. ENXY19	This project will provide in depth facility assessment, capital purchase of Auxiliary components and SCADA upgrades to meet current Agency engineering guidelines. The report will include pre assessment of all existing equipment, review of functional requirements, equipment reliability and criticality study, on-site assessment by field verification of assets, safety and functionality assessment including Operational Readiness Test, Functional Requirement Test, and Reliability Acceptance Test, and Business Case Evaluation between PPA and IEUA owner operator option.
REEP	REEP Return to Service Condition Assessment No. AMXXX2	This project will provide in depth facility assessment, capital purchase of Auxiliary components and SCADA upgrades to meet current Agency engineering guidelines. The report will include pre assessment of all existing equipment, review of functional requirements, equipment reliability and criticality study, on-site assessment by field verification of assets, safety and functionality assessment including Operational Readiness Test, Functional Requirement Test, and Reliability Acceptance Test, and Business Case Evaluation between PPA and IEUA owner operator option.

REEP	RP5 O&M Building No. ENXY22	Project deliverables to include: 1. New O&M building facility with work space and office space to house assigned personnel in the Operations and Maintenance Units. 2. Shop area for equipment washdown, equipment repair, operations lab, etc. 3. Office space, showers, lockers rooms, bathrooms, break rooms, common areas, etc. 4. Parking space for fleet vehicles. 5. All associated support equipment for an office environment.

End of System Summary

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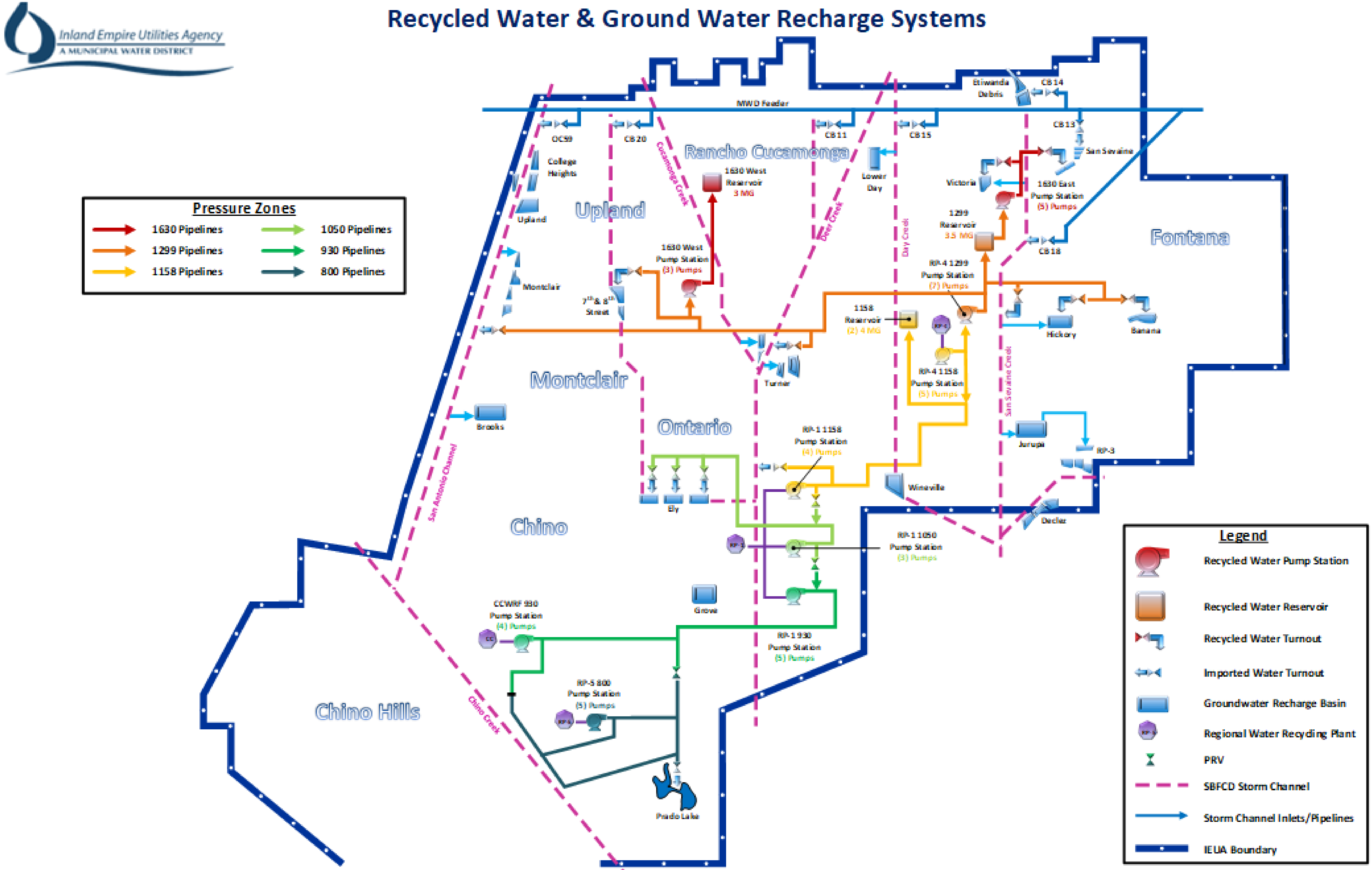

Figure 7-7: Recycled Water Distribution (RW) & Groundwater Recharge Systems (GWR) – Schematic

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Table 7-7: Recycled Water Distribution and Ground Water Recharge Systems – Project Summary

#	Project Number[1]	Project Name	Project Description	Fund[2]	Project Type[3]	Fiscal Year Budget (Dollars)										
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Ten-Year Total
1	EN23078	GWR Assessment Projects (Ken Monfore)	GWR Condition Assessment	RW	OM	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	500,000
2	EN22008	GWR Asset Management Project (Ken Monfore)	Solicit for qualified firms to provide the consulting services to meet the goal of the AM program and seek contractors to implement condition assessment activities or needed repairs or rehab. The activities will be specific to the GWR System.	RW	CC	100,000	100,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	4,200,000
3	EN22050	GWR Basin PLC Upgrades (Joel Ignacio)	The project will fund the cost to purchase the required replacement. IEUA staff will install five new terminals once a year for three years to address the 17 sites.	RW	CC	300,000	200,000	0	0	0	0	0	0	0	0	500,000
4	ENXXX18	GWR Monitoring Well (Andrew Campbell)		RW	EE											0
5	EN22049	GWR-RW OIT Upgrades (Joel Ignacio)	The project will fund the cost to purchase the required replacement. IEUA staff will install five new terminals once a year for three years to address the 17 sites.	RW	RP	18,700										18,700
6	EN23087	New Recycled Water Project PDR's FY 22/23 (Jason Marseilles)	Create preliminary design reports for new project requests from Operation and Maintenance.	WC	CC	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	1,000,000
7	EN25031	Recycled Water Program Strategy 2025 (Liza Munoz)		WC	OM			250,000								250,000
8	IS22005	RW / GWR SCADA Infrastructure Replacement (Donald Hamlett)		RW	RP	60,000										60,000
9	EN16065	RW Connections to JCSD (Liza Munoz)		WC	CC	1,000,000	1,000,000	12,000,000	12,000,000			0	0	0	0	26,000,000
10	EN19051	RW Hydraulic Modeling (Matthew Poeske)	Ongoing RW hydraulic modeling needs.	WC	OM	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	400,000

#	Project Number[1]	Project Name	Project Description	Fund[2]	Project Type[3]	Fiscal Year Budget (Dollars)										
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Ten-Year Total
11	WR23002	RW Interconnection to the City of Rialto (Liza Munoz)		WC	CC	2,000,000	2,000,000	24,500,000	24,500,000			0	0	0	0	53,000,000
12	EN23119	RW SCADA Migration (Pierre Cayatte)	Migrate the RW SCADA application to Plant PAx 5.0. Upgrade necessary control hardware to support Plant PAx 5.0. Create Process Control Narratives (PCNs) for RW to document system operation, signal monitoring, alarm management, data collection, and data reporting. Create process information reports. Separate the RW HMI from GWR HMI withing the RW/GWR SCADA application. Separate the RW pump stations from the wastewater facility SCADA applications.	WC	RP	800,000	3,000,000	830,000								4,630,000
13	EN23113	RW/GRW Safety Work Improvements for Basin Gate Actuator Access (Joel Ignacio)	The following are Operations and Maintenance's expectations and corresponding recommendations: To construct a safe platform with safety railing and toe boards around the actuators. The platform will need to be accessible from a hinged and lockable gate.	RW	CC	200,000	820,000									1,020,000
14	EN19030	WC Asset Management - Assessment Only (Francis Concemino)	Solicit for qualified firms to provide the consulting services to meet the goal of the AM program and seek contractors to implement condition assessment activities or needed repairs or rehab. The activities will be specific to the Recycled Water System.	WC	OM	75,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	975,000
15	EN22009	WC Asset Management Project (Ken Monfore)	Solicit for qualified firms to provide the consulting services to meet the goal of the AM program and seek contractors to implement condition assessment activities or needed repairs or rehab. The activities will be specific to the Recycled Water Pumps Station and Reservior Systems	WC	CC	100,000	100,000	3,000,000	5,000,000	7,000,000	8,900,000	8,900,000	8,900,000	8,900,000	8,900,000	59,700,000
16	EN23017	WC Emergency O&M Projects FY 22/23 (Rachael Solis)		WC	OM	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	1,500,000
17	EN23090	WC On-Call/Small Projects FY 22/23 (Rachel Solis)	Review of the design and construction administration responsibilities and submission requirements identified in the Scope of Work with the Project Team members. Items such as: contract	WC	OM	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	1,500,000

#	Project Number[1]	Project Name	Project Description	Fund[2]	Project Type[3]	Fiscal Year Budget (Dollars)										
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Ten-Year Total
			deliverables, special sequencing or phased construction requirements, special hours for construction based on Agency programs or needs, delivery dates of critical and long lead items, utility interruptions or shut down constraints for tie-ins, weather restrictions, and coordination with other project construction activities at the site shall be addressed.													
18	PL23006	WC Planning Documents (Pietro Cambiaso)		WC	OM	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	2,500,000
19	PL18002	Basin Plan Amendment (Joshua Aguilar)		NC	OM	125,000	20,000									145,000
20	PL19005	CBP - Chino Basin Program (Liza Munoz)		WW	CC	5,043,266						0	0	0	0	5,043,266
21	WR23003	CBP - Extraction Facilities (Liza Munoz)		WW	CC	10,000,000	10,000,000	72,000,000	84,000,000	72,000,000	12,000,000	0	0	0	0	260,000,000
22	WR26001	CBP - RW Interconnection to the MWD-Rialto Pipeline (Liza Munoz)		WW	CC				1,000,000	9,000,000		0	0	0	0	10,000,000
23	EN15002	1158 Reservoir Site Cleanup (Jamal Zughbi)	A review of the 1158 Reservoir site will be conducted to determine if the remaining remnants of the old oil piping, liquids and soils, should be removed from the site. After the determination is made, a mitigation plan will be developed and implemented	WC	CC	300,000										300,000
24	EN23121	1299 Reservoir Paint/Coating Repairs and Upgrades (James Spears)	The project will consist of abrasive blast cleaning all interior coated surfaces to Near White Metal (SSPC-SP10), applying a 100% solids epoxy coating system to surfaces at and above the water fluctuation zone, and applying 15 mils of a two part epoxy coating system to the remaining shell and 20 mils on the bottom surfaces. In addition, minor repairs to structure components and miscellaneous safety upgrades will be made as required.	WC	CC	100,000	1,900,000									2,000,000

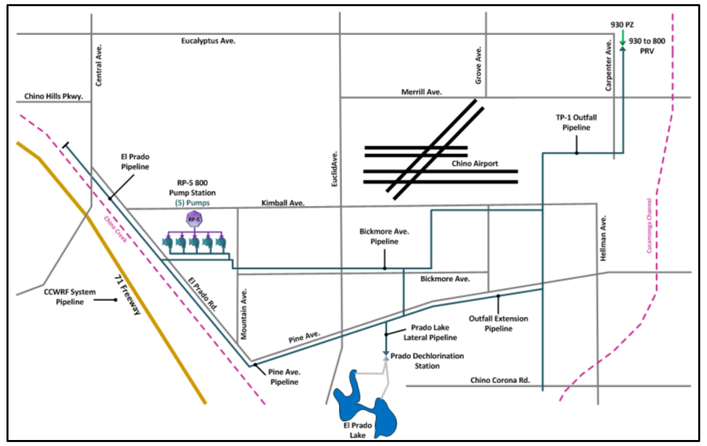
#	Project Number[1]	Project Name	Project Description	Fund[2]	Project Type[3]	Fiscal Year Budget (Dollars)										
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Ten-Year Total
25	EN23124	1630 East Pump Station VFD Installation (James Spears)	The following are Operations and Maintenance's expectations and corresponding recommendations: 1. Install new VFD and associated wiring for the 200 HP pump. 2. Develop and implement new programming to incorporate the new VFD motor.	WC	CC	550,000	200,000									750,000
26	EN24005	1630 West Reservoir Paint/Coating Repair (James Spears)	The project will consist of minor touch-up of delaminating, blistering, corroding or other defective coating and painting on interior and exterior surfaces by Power Tool Cleaning to Near White Metal (SSPC-SP11) or other surface preparation. Following the surface preparation, the application of a compatible epoxy or epoxy/urethane coating/paint system will occur. In addition, minor repairs to structure components and miscellaneous safety upgrades will be made as required.	WC	CC	0	0	0	0	0	50,000	1,500,000	0	0	0	1,550,000
27	EN24006	930 Reservoir Paint/Coating Repairs and Upgrades (James Spears)	The project will consist of minor touch-up of delaminating, blistering, corroding or other defective coating and painting on interior and exterior surfaces by Power Tool Cleaning to Near White Metal (SSPC-SP11) or other surface preparation. Following the surface preparation, the application of a compatible epoxy or epoxy/urethane coating/paint system will occur. In addition, minor repairs to structure components and miscellaneous safety upgrades will be made as required.	WC	CC	0	0	0	0	0	50,000	0	0	0	0	50,000
28	EN23066	Hickory Basin Replacement Monitoring Well (Andrew Campbell)	The NRG closure has impacted the RW GWR program by removing a monitoring well from use (the Reliant East Well). IEUA will need to replace that monitoring well with a new well for compliance. The cost of the well would be approximately $200K to $300K. A new well could be located on the new reservoir site, RP4, or the IERCF.	WC	EE	300,000										300,000
29	EN22051	Jurupa Basin VFD Upgrades (Joel Ignacio)	Directly purchase and install the replace VFD component	RW	CC	300,000										300,000

#	Project Number[1]	Project Name	Project Description	Fund[2]	Project Type[3]	Fiscal Year Budget (Dollars)										
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Ten-Year Total
30	EN21057	Recharge Basin Clean-up of Illegally Dumped Materials (Joel Ignacio)	The scope of work includes planning, permitting, designing, and constructing the new assets to effectively collect and dispose all solids waste debris that enter or exit the following recharge basins: Turner Basin, Ely Basin, Jurupa Basin, and RP-3 Basin.	RW	CC	150,000			0							150,000
31	RW15003	Recharge Master Plan Update Projects (Joel Ignacio)	Initially the scope for RW15003 covered the preliminary-design, preliminary environmental review, and initially permitting review for the RMPU projects that were recommended from the 2013 Recharge Master Plan Update (RMPU). During the completion of the preliminary design efforts, the list of projects that received stakeholder approval for full design and construction, a decision was made to continue under the same project to implement these recommended projects through design and construction with permit and CEQA. The RMPU projects are Wineville Basin, Jurupa Basin, Force Main System between Wineville and Jurupa, Victoria Basin, and Montclair Basin.	RW	CC	10,040,000	2,200,000	0	0	0	0		0	0	0	12,240,000
32	EN20050	Reservoir Maintenance (Andrew Campbell)		WC	OM	20,000			20,000			20,000				60,000
33	EN21051	Ely Monitoring Well (Jamal Zughbi)	Field Monitoring, an engineering firm specializing in geotechnical, subsidence, and groundwater modeling, will be used to develop a plan, implement the monitoring, and provide a recommendation	WC	OM	400,000										400,000
34	EN23037	Etiwanda Interceptor Grade-Break RW Relocation (Matthew Poeske)	The scope of work includes the removal of the existing 36-inch and installation of new 4,800 linear feet of 42-inch recycled water line.	WC	CC	300,000	3,000,000	1,000,000								4,300,000

(1) Project Number – from Ten-Year Capital Improvement Project; Final Capital Project List 03-17-2014

(2) Project Fund – Administrative Services (GG), Non-Reclaimed Water (NC), Regional Composting Authority (RM), Ground Water Recharge (RW), Recycled Water (WC), Regional Capital (RC), Regional O&M (RO), or Water Fund (WW)
(3) Project Type – Capital Construction Project (CC), Capital Major Equipment Project (EQ), Operations & Maintenance Project (OM), Reimbursable Project (RE), or Capital Replacement Project (RP)

Asset Management System Summary – RW
800 Pressure Zone
1. Asset Profile



930 to 800 Pressure Reducing Valve (930 Pressure Zone Asset)
The 930 to 800 PRV is located at the intersection of Eucalyptus Ave. and Carpenter Ave. and is utilized to maintain the downstream pressure in the 800 Pressure Zone. The system includes a 16" Cla-Val PRV, flow meter, and pressure transmitter. The system has a design flow range of 200 gpm to 14,000 gpm.

RP-5 800 Pump Station
The RP-5 800 Pump Station provides recycled water to the 800 Pressure Zone for direct use by agricultural customers, the City of Chino, and San Bernardino County for feed water to El Prado Lake. The pump station is comprised of 5 pumps:
- (2) 150 hp vertical turbine, VFD driven, 1,925 gpm Pumps
- (3) 150 hp vertical turbine, constant speed, 1,925 gpm Pumps

The RP5 800 Pump Station has two selectable automatic control philosophies:
- Wet Well Level Control – the pumps will be modulated to maintain an operator adjustable wet well level set point normally set at 14'.
- Pressure Control – the pumps will be modulated to maintain an operator adjustable discharge pressure set point normally set at 120 psi.

800 Pipelines
- *TP-1 Outfall Pipeline* – 15,700 LF of 30" pipeline running from the 930 to 800 PRV to Chino Corona Rd.
- *Outfall Extension Pipeline* – 6,600 LF of 30" pipeline running along Pine Ave. from the TP-1 Outfall Pipeline to the Prado Lake Lateral continuing with an additional 6,700 LF of 14" pipeline from the Prado Lake Lateral to El Prado Golf Course.
- *Prado Lake Lateral Pipeline* – 535 LF of 30" pipeline running from the Outfall Extension Pipeline continuing with an additional 2,100 LF of 24" pipeline to the Prado Lake Dechlorination Station.
- *Pine Ave. Pipeline* – 2,200 LF of 16" pipeline running from the El Prado Golf Course to RP-2.
- *El Prado Pipeline* – 12,800 LF of 10" pipeline running from RP-2 to the CCWRF.
- *Bickmore Pipeline* – Consists of multiple pipeline segments including:
  - 5,500 LF of 18" pipeline running along Kimball Ave. from the TP-1 Outfall Pipeline to Rincon Meadows Rd.
  - 5,600 LF of 18" pipeline running along Rincon Meadows Rd. from Kimball Ave. to Bickmore Ave. continuing with an additional 1,550 LF of 12" pipeline from Bickmore Ave. to Pine Ave.
  - 6,300 LF of 30" pipeline along Bickmore Ave. from Rincon Meadows Rd. to San Antonio Ave.
  - 2,700 LF of 18" pipeline along Bickmore Ave. from San Antonio Ave. to Mountain Ave.
  - 2,500 LF of 18" pipeline running from the intersection of Mountain Ave. and Bickmore Ave. to RP-5.
  - 1,000 LF of 10" pipeline running from RP-5 to the El Prado Pipeline.

Prado Dechlorination Station
The Prado Dechlorination Station provides dechlorinated recycled water to El Prado Lake. The station is comprised of the following main components:
- A 12" sleeve flow control valve with 14" magnetic flow meter and pressure transmitter.
- (2) 5 gph sodium bisulfite chemical metering pumps
- (3) 20 gph sodium bisulfite chemical metering pumps
- (2) upstream chlorine analyzers
- (2) downstream chlorine analyzers biased to measure sodium bisulfite

The flow control is automatically controlled either to maintain a flow control set point or an upstream pressure set point. The sodium bisulfite chemical metering pumps are controlled maintain a downstream sodium bisulfite residual.

2. Capacity Profile
Table 1 Capacity by System

System Sub System(s)	Design Capacity (Min, max, peak and/or average)	Notes
930 to 800 PRV	200 – 14,000 gpm	
RP-5 800 Pumps	2 @ 1,925 gpm 3 @ 1,925 gpm	VFD Constant
TP-1 Outfall Pipeline	30" – 13,200 gpm	6.0 ft/s max velocity(mv)
Outfall Extension Pipeline	30" – 13,200 gpm 14" – 2,875 gpm	6.0 ft/s mv
Prado Lake Lateral Pipeline	30" – 13,200 gpm 24" – 8,500 gpm	6.0 ft/s mv
Pine Ave. Pipeline	16" – 3,755 gpm	6.0 ft/s mv
El Prado Pipeline	10" – 1,500 gpm	6.0 ft/s mv
Bickmore Pipeline	30" – 13,200 gpm 18" – 4,750 gpm 10" – 1,500 gpm	6.0 ft/s mv
Prado Sleeve Valve	300 – 14,000 gpm	
Prado SBS Pumps	2 @ 0.5 – 5 gph 3 @ 2 – 20 gph	

3. Asset Ratings
Table 2 Asset Ratings

Process	Location Area	Rating Scale 1 = New, 5 = Failed				
		Condition	Capacity	Function	Reliability	Efficiency
930 to 800 PRV	930	1	3	2	1	1
RP-5 800 Pumps	800	1	3	3	2	1
TP-1 Outfall Pipeline	800	3	3	3	2	2
Outfall Extension Pipeline	800	3	3	3	3	2
Prado Lake Lateral Pipeline	800	2	3	3	3	2
Pine Ave. Pipeline	800	2	3	3	4	2
El Prado Pipeline	800	2	3	3	3	1
Bickmore Pipeline	800	1	4	5	2	1
Prado Sleeve Valve	800	1	2	2	1	1
Prado SBS Pumps	800	1	2	2	1	1

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation
Bickmore Pipeline Capacity
At a maximum velocity of 6 ft/s, the 18" diameter sections of the Bickmore Pipeline have a capacity of 4,750 gpm. All recycled water supply from RP-5 is conveyed through the Bickmore Pipeline; and therefore, the current average daily RP-5 recycled water supply of 7,000 gpm exceeds the recommended capacity. In addition, when the RP-5 pump station is discharging 7,000 gpm, the discharge pressure at the pump station exceeds the pressure setting of the emergency pressure relief valve and discharges recycled water back into the RP-5 wet well.

Table 3 Condition of Select Assets

Assets	Condition
930 to 800 PRV	New - Constructed 2013
RP-5 800 Pumps	New – Constructed 2011
TP-1 Outfall Pipeline	Constructed 1976
Outfall Extension Pipeline	Constructed 1977
Prado Lake Lateral Pipeline	Constructed 1977
Pine Ave. Pipeline	Constructed 2004
El Prado Pipeline	Constructed 1993
Bickmore Pipeline	Constructed 2006
Prado Sleeve Valve	New – Constructed 2011
Prado SBS Pumps	2 Small Pumps – Const. 2011 3 Large Pumps – Const. 1996

* Appendix B – Condition Assessment Reports

5. Current and Future Projects
Current Projects
N/A.

Future Projects
800 Pressure Zone Reservoir – Construction of an 800 Pressure Zone Reservoir in the City of Chino Hills.

RP-5 Recycled Water Pipeline Bottleneck – Construction of additional recycled water pipeline leaving RP-5 to allow more recycled water to be delivered from this facility into the 800 Pressure Zone.

Affected Planned Projects
N/A

Engineering & Management Strategies
Recycled Water Master Plan
Ten Year Capital Improvement Plan

6. Investment Program
Table 4 5-Year Summary

Investment (000's)	Total Projected Budget	Cost to date	2012-13	2013-14	2014-15	2015-16
RP-5 Pipeline Bottleneck	$1,300	---	---	$200	$500	$300
800 Reservoir	$3,400	---	---	---	---	$3,400

Asset Management System Summary – RW

Auxiliary Systems – 800 Pressure Zone

1. Asset Profile

RP-5 800 Pump Station

- *Electrical System – The electrical energy to power the RP-5 800 pump station is obtained from the RP-5 treatment facility, which receives power from the local electrical grid (SCE) and from onsite energy generation (solar, biogas internal combustion engines, and emergency generators). The solar assets are owned and operated by private firms as part of power purchase agreements. The biogas internal combustion engines are owned by the Agency, but leased to a private firm producing biogas at the RP-5 solids handling facility. The electrical feed from the grid is composed of two 12 kV feeders through the RP-5 treatment facility to Power Center 3, where transformers and switchgear are located to distribute electrical energy to the RP-5 800 pump station. A single line diagram of the RP-5 800 pump station electrical system is shown in Appendix B. Diesel emergency generators are used in the event of a power failure. Two 1.0 MW generators are located south of Power Center 3 and supply power to the RP-5 treatment facility including the RP-5 800 pump station.*
- *Instrumentation and Control System – An extensive array of instruments is used to monitor and control the processes for the RP-5 800 pump station. All the processes of the pump station are observed and controlled by the RP-5 treatment facility SCADA system. Local control wiring is fed from the individual pieces of equipment to MCCs and input/output (I/O) hubs in Power Center 3. The I/O hubs then transmit the control data by fiber optic cable to the Foxboro SCADA servers.*

Prado Dechlorination Station

- *Electrical System – The electrical energy to power the Prado dechlorination station is obtained from the local electrical grid (SCE). The electrical feed from the grid is composed of a 480 V feeder, a main power switch, and an automatic transfer switch before terminating in MCC-1. A single line diagram of the Prado dechlorination station electrical system is shown in Appendix B. A recently upgraded 27 kW Kohler diesel generator is located in the Prado sodium bisulfite pump room for use in a power failure.*
- *Utility Water System – The utility water system is supplied using recycled water from upstream of the sleeve valve and is used mainly for wash-down water in the pump and analyzer buildings. The piping consists of several isolation valves and point-of-use connections.*
- *Potable Water System – The potable water system is used throughout the Prado dechlorination station for restrooms, sinks, and eye-wash stations. The system is supplied from a service on Johnson Ave. from the City of Chino. The utility water system is supplied using recycled water from upstream of the sleeve valve and is used mainly for wash-down water in the pump and analyzer buildings. The piping consists of several isolation valves and point-of-use connections.*
- *Instrumentation and Control System – An extensive array of instruments is used to monitor and control the processes for the Prado dechlorination station. All the processes of the dechlorination station are observed and controlled by the local programmable logic controller (PLC) system. Local control wiring is fed from the individual pieces of equipment to an I/O hub and local PLC located in Control Panel 3300. Control data is then sent to RP-5 and RP-1 through a radio transmitter for remote access to the control system.*

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
RP-5 800 Pump Station		
Electrical System		
Utility Voltage	12 kV	2 Feeders
Transformers	2 @ 12 kV to 480 V	
Switchgear	1 @ 480 V	
Distribution	2 @ 480 V	MCCs
Generator	2 @ 1,100 kW 1,490 Bhp	
Instrumentation and Control System		
HMI Workstation	1 unit	
RTU	N/A	
PLC	N/A	
I/O Hub	3 units	
Radio Transmitter	1 unit	RP-5
Prado Dechlorination Station		
Electrical System		
Utility Voltage	480 V	2 Feeders
Transformers	NA	
Switchgear	1 @ 480 V	ATS
Distribution	1 @ 480 V	MCCs
Generator	1 @ 27 kW 36 Bhp	
Instrumentation and Control System		
HMI Workstation	1 unit	
RTU	N/A	
PLC	1 unit	CP 3300
I/O Hub	1 unit	CP 3300
Radio Transmitter	1 unit	

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
RP-5 800 Pump Station				
Electrical System	1	2	2	2
Instrumentation and Control System	2	3	2	3
Prado Dechlorination Station				
Electrical System	3	3	3	3
Utility Water System	3	3	3	3
Potable Water System	3	3	3	3
Instrumentation and Control System	2	1	2	1

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

RP-5 800 Pump Station:
No issues requiring immediate attention.

Prado Dechlorination Station:
No issues requiring immediate attention.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
RP-5 800 Pump Station		
Electrical System	2004 2010	
Instrumentation and Control System	2004 2010	
Prado Dechlorination Station		
Electrical System	1990	
Utility Water System	1990	
Potable Water System	1990	
Instrumentation and Control System	1990 2011	

* Appendix B – Condition Assessment Reports

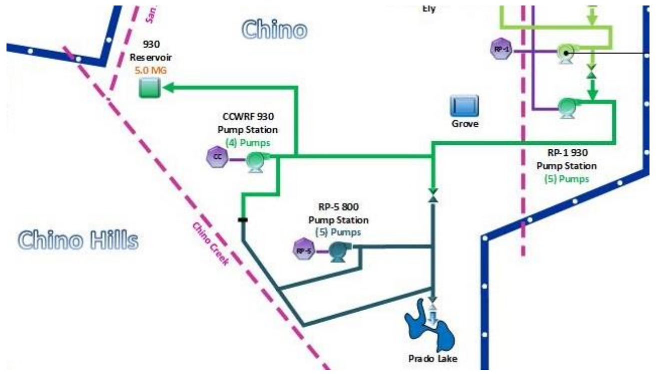
Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – RW

930 Pressure Zone

1. Asset Profile



RP-1 930 Pump Station
The RP-1 930 pump station provides recycled water to the 930 pressure zone for direct use by agricultural customers, the City of Chino, and the City of Chino Hills. The pump station is composed of five pumps:

- Three 150 hp vertical-turbine, VFD-driven, 2,790 gpm pumps
- Two 500 hp vertical-turbine, VFD-driven, 9,330 gpm pumps

The RP-1 930 pump station is automatically controlled to maintain a discharge-pressure set point of about 55 psi.

CCWRF 930 Pump Station
The CCWRF 930 pump station provides recycled water to the 930 pressure zone for direct use by agricultural customers, the City of Chino, and the City of Chino Hills. The pump station is composed of (2) 300 hp vertical-turbine, VFD-driven, 2,585 gpm pumps, and (3) 300 hp vertical turbine, constant, 2,585 gpm pumps. The CCWRF 930 pump station is automatically controlled to cycle pumps on and off based on level set points of the RP-1 recycled water wet well.

930 Reservoir
The 930 reservoir provides recycled water supply to the 930 pressure zone. The 930 reservoir is located north of Galloping Hills Road in the City of Chino Hills. The reservoir has a design capacity of 5 million gallons (MG), a diameter of 170 feet, and a maximum water surface level of 30 feet, and it is equipped with a level transmitter, flow meter, and inlet/outlet check valves.

930 Pipelines

- *CCWRF System Pipeline* – 2,300 LF of 30-inch pipeline from CCWRF to the intersection of Monte Vista Ave. and Chino Hills Parkway, continuing with an additional 5,200 LF of 20-inch pipeline along Monte Vista Ave. between Chino Hills Parkway and Edison Ave.
- *Edison Segment A Pipeline* – 18,500 LF of 30-inch pipeline from the intersection of Chino Hills Parkway and Telephone Ave. to the intersection of Euclid Ave. and Eucalyptus Ave.
- *Edison Segment B Pipeline* – 15,900 LF of 30-inch from the intersection of Euclid Ave. and Eucalyptus Ave. to the TP-1 outfall pipeline.
- *TP-1 Outfall Pipeline* – 12,800 LF of 30-inch pipeline from RP-1 to the 930 to 800 pressure reducing valve (PRV).

930 to 800 Pressure Reducing Valve (PRV)
The 930 to 800 PRV is located at the intersection of Eucalyptus Ave. and Carpenter Ave. and is used to maintain the downstream pressure in the 800 pressure zone. The system includes a 16-inch Cla-Val PRV, flow meter, and pressure transmitter. The system has a design flow range of 200 gpm to 14,000 gpm.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
RP-1 930 Pumps	3 @ 2,790 gpm 2 @ 9,330 gpm	VFD VFD
CCWRF 930 Pumps	2 @ 2,585 gpm 3 @ 2,585 gpm	VFD Constant
930 Reservoir	1 @ 5 MG	
CCWRF System Pipeline	30 -inch – 13,200 gpm 20-inch – 5,900 gpm	6.0 ft/s max velocity(mv)
Edison Segment A Pipeline	30-inch – 13,200 gpm	6.0 ft/s mv
Edison Segment B Pipeline	30-inch – 13,200 gpm	6.0 ft/s mv
TP-1 Outfall Pipeline	30-inch – 13,200 gpm	6.0 ft/s mv
930 to 800 PRV	200 – 14,000 gpm	

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
RP-1 930 Pumps	2	3	2	3
CCWRF 930 Pumps	1	2	2	3
930 Reservoir	2	2	2	2
CCWRF System Pipeline	3	3	4	3
Edison Segment A Pipeline	2	3	3	1
Edison Segment B Pipeline	2	3	3	1
TP-1 Outfall Pipeline	4	5	4	1
930 to 800 PRV	1	3	2	1

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

RP-1 930 Pumps
No issues requiring immediate attention

CCWRF 930 Pumps
No issues requiring immediate attention

930 Reservoir
No issues requiring immediate attention

CCWRF System Pipeline
Flexibility is needed to supply recycled water from the 930-foot pressure zone to the 800-foot pressure zone. In addition, allow CCWRF 930 pumps to distribute more recycled water. Project EN17007 will address this issue.

Condition assessment performed in 2014 identified that the pipeline was not installed with either a corrosion monitoring or cathodic protection system. Therefore, the condition of the pipeline is unknown at this time. A potential project is needed to address this issue.

Edison Segment A Pipeline
No issues requiring immediate attention.

Condition assessment performed in 2014 identified that the pipeline is electrically shorted to a bare metallic casing installed below the stormwater channel and is unlikely to be receiving any cathodic protection. In addition, the pipeline is not electrically isolated at the point of connection with CCWRF System Pipeline or Edison Segment B Pipeline, which link both cathodic protection systems. A potential project is needed to address these issues.

Edison Segment B Pipeline
There is no valve at Eucalyptus Ave. and Central Ave to isolate the west side of the system.

Condition assessment performed in 2014 identified that there is no cathodic protection taking place on the pipeline and the inspection locations have been paved over. A potential project is needed to address these issues.

TP-1 Outfall Pipeline
During high recycled-water-demand periods, it has been common to flow more than 18,000 gpm through this pipeline to maintain system pressures. This equates to a flow velocity of more than 8 ft/s, which is not recommended for long-term operation. Because of the age of the pipeline and the operational requirements placed on the pipeline, condition assessment should be performed. A condition assessment should be scheduled in 2015 to assess any potential project requirements. Project EN19003 will provide for a parallel pipeline following the TP-1 Out fall Pipeline from RP-1 to Edison Ave. to address the existing pipeline capacity issues. In addition, a TBD project has been identified in the TYCIP to address the segment of pipeline from Chino to Schaeffer.

930 to 800 PRV
No issues requiring immediate attention.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
RP-1 930 Pumps	2007 2012	
CCWRF 930 Pumps	2000	
930 Reservoir	2014	
CCWRF System Pipeline	2000	2014 Report
Edison Segment A Pipeline	2006	2014 Report
Edison Segment B Pipeline	2006	2014 Report
TP-1 Outfall Pipeline	1976	Scheduled 2015
930 to 800 PRV	2007 2013	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
CCWRF System Pipeline	930 Pressure Zone Pipeline Cathodic Protection	Install cathodic protection on the CCWRF RW pipeline and Edison Segment B pipeline, and repair cathodic protection on Edison Segment A Pipeline.

Asset Management System Summary – RW
Auxiliary Systems – 930 Pressure Zone
1. Asset Profile

RP-1 930 Pump Station

- *Electrical System – The electrical energy to power the RP-1 930 pump station is obtained from the RP-1 treatment facility, which receives power from the local electrical grid (SCE) and from onsite energy generation (solar, fuel cell, and emergency generators). The solar and fuel cell assets are owned and operated by private firms as part of power purchase agreements. The electrical feed from the grid is composed of a 12 kV feeder to the RP-1 power reliability building (PRB), where transformers and switchgear are located to distribute electrical energy throughout the facility. TP-1 and the RP-1 930 pump station are powered through the H9 breaker. A single line diagram of the RP-1 930 pump station electrical system is shown in Appendix B. The RP-1 treatment facility has three 1.25 MW diesel generators located in the PRB, and TP-1 has one 670 kW diesel generator; however, these generators were not designed to maintain operation of the recycled water pump stations during a power failure.*
- *Instrumentation and Control System – An extensive array of instruments is used to monitor and control the processes for the RP-1 930 pump station. All the processes of the pump station are observed and controlled by a local PLC system. Local control wiring is fed from the individual pieces of equipment to I/O hub and PLC in the RP-1 930 pump station electrical room. Fiber optic cable is then used to connect the local PLC to the RP-1 server workstation for remote access and transition of control data into the RP-1 SCADA system.*

CCWRF 930 Pump Station

- *Electrical System – The electrical energy to power the CCWRF 930 pump station is obtained from the CCWRF treatment facility, which receives power from the local electrical grid (SCE) and from onsite energy generation (solar and emergency generators). The solar assets are owned and operated by private firms as part of power purchase agreements. The electrical feed from the grid is composed of a 12 kV feeder to the CCWRF electrical room, where transformers and switchgear are located to distribute electrical energy throughout the facility. A single line diagram of the CCWRF 930 pump station electrical system is shown in Appendix B. The CCWRF treatment facility has one 1.50 MW diesel generator located in the main electrical room; however, this generator was not designed to maintain operation of the recycled water pump station during a power failure.*
- *Instrumentation and Control System – An extensive array of instruments is used to monitor and control the processes for the CCWRF 930 pump station. All the processes of the pump station are observed and controlled by a local PLC system. Local control wiring is fed from the individual pieces of equipment to an I/O hub and PLC in the CCWRF recycled-water pump-station control room. Fiber optic cable is then used to connect the local PLC to the CCWRF radio transmitter to send the signal to the new recycled-water master server located at RP-1.*

930 to 800 Pressure Reducing Valve (PRV)

- *Electrical System – The electrical energy to power the 930 to 800 PRV station is obtained from onsite energy generation located in the PRV and stored in onsite 12 V batteries. There is no electrical feed from the grid. A single line diagram of the 930 to 800 PRV station electrical system is shown in Appendix B. There is no emergency generation for this site.*
- *Instrumentation and Control System – Control of the PRV is maintained hydraulically and does not require an automated control system. System flow and pressure are monitored at the 930 to 800 PRV. Local wiring is fed from the individual pieces of equipment to a local PLC. The PLC is connected to a remote telemetry unit, which transmits the signals back to RP-1 over a 4G data network to the GWR PLC*

930 Reservoir

- *Electrical System – The electrical energy to power the 930 reservoir is obtained from the local electrical grid (SCE), which is composed of a 120 V feeder to a local control panel along Galloping Hills Road. The 930 reservoir does not have emergency power generation in case of power failure.*
- *Instrumentation and Control System – Level, flow, and valve position are monitored at the 930 reservoir. Local control wiring is fed from the individual pieces of equipment to an I/O hub and PLC in the 930 reservoir local control panel. A radio antenna is then used to connect the local PLC for remote access.*

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
RP-1 930 Pump Station		
Electrical System		
Utility Voltage	12 kV	2 Feeders
Transformers	2 @ 12 kV to 480 V	
Switchgear	1 @ 480 V	
Distribution	1 @ 480 V	MCCs
Generator	N/A	
Instrumentation and Control System		
HMI Workstation	1 unit	
RTU	N/A	
PLC	1 unit	
I/O Hub	1 unit	
Radio Transmitter	1 unit	RP-1
CCWRF 930 Pump Station		
Electrical System		
Utility Voltage	12 kV	
Transformers	1 @ 12 kV to 480 V	
Switchgear	N/A	
Distribution	1 @ 480 V	MCCs
Generator	N/A	
Instrumentation and Control System		
HMI Workstation	1 unit	
RTU	N/A	
PLC	1 unit	LCP 1200
I/O Hub	1 unit	LCP 1200
Radio Transmitter	1 unit	CCWRF
930 to 800 PRV Station		
Electrical System		
Utility Voltage	12 V DC	Onsite Generation
Transformers	N/A	
Switchgear	N/A	
Distribution	N/A	
Generator	N/A	
Instrumentation and Control System		
HMI Workstation	N/A	
RTU	1 unit	
PLC	1 unit	
I/O Hub	N/A	
Radio Transmitter	N/A	4G
930 Reservoirs		
Electrical System		
Utility Voltage	120 V	
Transformers	N/A	
Switchgear	N/A	
Distribution	N/A	
Generator	N/A	
Instrumentation and Control System		
HMI Workstation	N/A	
RTU	1 unit	
PLC	1 unit	
I/O Hub	1 unit	
Radio Transmitter	1 unit	CCWRF

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor: Condition	Redundancy	Function	Reliability
RP-1 930 Pump Station				
Electrical System	3	3	3	4
Instrumentation and Control System	3	3	3	3
CCWRF 930 Pump Station				
Electrical System	3	3	3	4
Instrumentation and Control System	3	3	3	3
930 to 800 PRV Station				
Electrical System	1	3	3	3
Instrumentation and Control System	1	3	3	3
930 Reservoir				
Electrical System	2	2	2	2
Instrumentation and Control System	2	2	2	2

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

RP-1 930 Pump Station:

- **Electrical System**
  RP-1 has three emergency diesel generators, and TP-1 has one emergency diesel generator to produce an effective electrical load of 3.5 MW. RP-1 has a varying electrical demand, ranging from 3.0 MW to as high as 4.8 MW depending on the amount of recycled water pumped. Therefore, RP-1 typically does not have the emergency generation capability to power the three recycled water pump stations located at the facility. The Agency would not be able to maintain the operation of the recycled water system if a sustained loss of utility power were to occur. Project EN22003 will address this issue.

CCWRF 930 Pump Station:

- **Electrical System**
  CCWRF has one emergency diesel generator rated to produce an electrical load of 1.5 MW. CCWRF has a base electrical demand, without recycled water pumping, ranging from 600 kW to 800 kW. The expansion of the CCWRF recycled water pump station will provide five 300 hp pumps for a total power demand of about 1,100 kW. Therefore, the CCWRF emergency diesel generator will not be able to provide the required electrical load for CCWRF and the maximum production of the recycled water pump station. Project EN22003 will address this issue.

930 to 800 PRV Station:
No issues requiring immediate attention.

930 Reservoir:
No issues requiring immediate attention.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
RP-1 930 Pump Station		
Electrical System	2007	
Instrumentation and Control System	2007 2012	
CCWRF 930 Pump Station		
Electrical System	2000 2014	
Instrumentation and Control System	2000 2014	
930 to 800 PRV Station		
Electrical System	2013	
Instrumentation and Control System	2013	
930 Reservoir		
Electrical System	2014	
Instrumentation and Control System	2014	

* Appendix B – Condition Assessment Reports

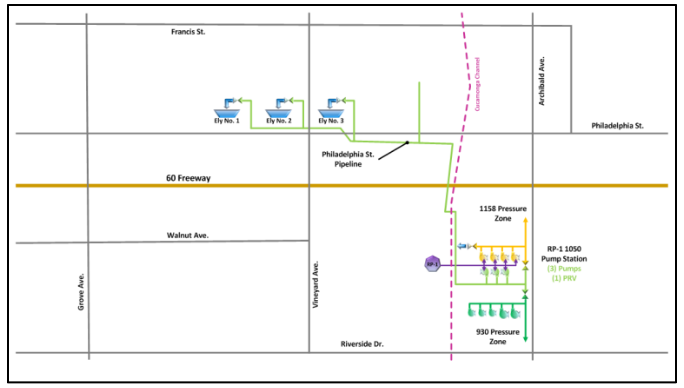
Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – RW/GWR

1050 Pressure Zone

1. Asset Profile



RP-1 1050 Pump Station
The RP-1 1050 pump station provides recycled water to the RP-1 utility water system, the 1050 pressure zone for direct use by the City of Ontario, and to Ely Basin for groundwater recharge. The pump station is composed of three 350 hp vertical-turbine pumps, VFD-driven, 3,750 gpm pumps. The 1050 pump station is automatically controlled to maintain a discharge-pressure set point of about 115 psi.

1050 Pipelines
Philadelphia Street Pipeline – 2,650 LF of 30-inch pipeline from the 1050 pump station to the 60 freeway, continuing with an additional 6,950 LF of 24-inch pipeline to Ely Basin No. 1.

1050 to 930 Pressure Reducing Valve (PRV)
The 1050 to 930 PRV is located at RP-1 and is used to transfer excess recycled water from the 1050 pressure zone to the 930 pressure zone when low pressures are experienced in the 930 pressure zone. The system includes a 24-inch Cla-Val PRV and 24-inch magnetic flow meter. The system has an operating flow range from 700 gpm to 20,000 gpm.

Ely Basin Turnouts
This system is composed of three separate turnouts, each including a 12-inch Cla-Val flow control valve, a flow meter, and a pressure transmitter to provide recycled water to Ely Basin Nos. 1, 2, and 3. Each turnout is designed for flow rates ranging from 700 gpm to 3,100 gpm.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
RP-1 1050 Pumps	3 @ 3,750 gpm	VFD
Philadelphia St. Pipeline	30-inch – 13,200 gpm 24-inch – 8,500 gpm	6.0 ft/s mv
1050 to 930 PRV	700 – 20,000 gpm	
Ely Basin Turnouts	3 @ 700 – 3,100 gpm	

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
RP-1 1050 Pumps	3	3	3	4
Philadelphia St. Pipeline	2	2	2	1
1050 to 930 PRV	2	3	2	2
Ely Basin Turnouts	3	3	4	4

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

RP-1 1050 Pumps
The VFD manufacturer no longer supports this equipment. Maintenance is running the VFD till end of useful life and then when will replace each VFD through Maintenance. No project needed to address this issue.

Philadelphia St. Pipeline
The utility water for RP-1 is supplied by the RP-1 1050 pumps, but the usage cannot be directly measured because there is no flow meter. Project EN16051 will address this issue.

Condition assessment performed in 2014 identified that the cathodic protection was functioning properly and the pipeline was installed in soil with "Negligible Corrosivity."

1050 to 930 PRV
No issues requiring special attention.

Ely Basin Turnouts
No issues requiring special attention.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
RP-1 1050 Pumps	2004	
Philadelphia St. Pipeline	2005	2014 Report
1050 to 930 PRV	2011	
Ely Basin Turnouts	2005	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – RW
Auxiliary Systems – 1050 Pressure Zone
1. Asset Profile

RP-1 1050 Pump Station

- *Electrical System – The electrical energy to power the RP-1 1050 pump station is obtained from the RP-1 treatment facility, which receives power from the local electrical grid (SCE) and from onsite energy generation (solar, fuel cell, and emergency generators). The solar and fuel cell assets are owned and operated by private firms as part of power purchase agreements. The electrical feed from the grid is composed of a 12 kV feeder to the RP-1 power reliability building (PRB), where transformers and switchgear are located to distribute electrical energy throughout the facility. TP-1 and the RP-1 1050 pump station are powered through the H9 breaker. A single line diagram of the RP-1 1050 pump station electrical system is shown in Appendix B. The RP-1 treatment facility has three 1.25 MW diesel generators located in the PRB, and TP-1 has one 670 kW diesel generator; however, these generators were not designed to maintain operation of the recycled water pump stations during a power failure.*
- *Instrumentation and Control System – An extensive array of instruments is used to monitor and control the processes for the RP-1 1050 pump station. All the processes of the pump station are observed and controlled by a local PLC system. Local control wiring is fed from the individual pieces of equipment to an I/O hub and PLC in the RP-1 1158 and 1050 pump station electrical room. Fiber optic cable is then used to connect the local PLC to the RP-1 server workstation for remote access and transition of control data into the RP-1 SCADA system.*

1050 to 930 PRV

- *Electrical System – The electrical energy to power the 1050 to 930 PRV is looped powered through the RP-1 1158 and 1050 pump station PLC. A single line diagram of the 1050 to 930 PRV electrical system is shown in Appendix B. Since the power draw to operate this system is negligible, the 670 kW TP-1 diesel generator will power the 1158 and 1050 pump station PLC during a power failure.*
- *Instrumentation and Control System – The 1050 to 930 PRV consists of a 24-inch Cla-Val PRV with position indication and control and a 24-inch flow meter. All of the processes of the PRV are observed and controlled by the 1158 and 1050 pump station PLC system. Local control wiring is fed from the individual pieces of equipment to an I/O hub and PLC in the 1158 and 1050 pump station electrical room. Fiber optic cable is then used to connect the local PLC to the RP-1 server workstation for remote access and transition of control data into the RP-1 SCADA system.*

Ely Basin Turnouts

- *Electrical System – The electrical energy to power the three Ely Basin recycled water turnouts is provided by three independent solar panels. A single line diagram of the Ely basin turnouts is shown in Appendix B. The turnouts do not have emergency power generation in case of power failure.*
- *Instrumentation and Control System – Each of the three Ely Basin recycled water turnouts has a 10dB yagi antenna that transmits control data to a PLC located at Ely Basin No. 1. The PLC at Ely Basin No. 1 then transmits control data back to the GWR workstation server located at RP-1 for remote access.*

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2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
RP-1 1050 Pump Station		
Electrical System		
Utility Voltage	12 kV	
Transformers	2 @ 12 kV to 480 V	
Switchgear	2 @ 480 V	MCCs
Distribution	1 @ 480 V	
Generator	N/A	
Instrumentation and Control System		
HMI Workstation	1 unit	
RTU	N/A	
PLC	1 unit	
I/O Hub	1 unit	
Radio Transmitter	1 unit	RP-1
1050 to 930 PRV		
Electrical System		
Utility Voltage	120 V	PLC Loop
Transformers	N/A	
Switchgear	N/A	
Distribution	N/A	
Generator	1 @ 670 kW 896 Bhp	TP-1
Instrumentation and Control System		
HMI Workstation	1 unit	
RTU	N/A	
PLC	1 unit	
I/O Hub	1 unit	
Radio Transmitter	1 unit	RP-1
Ely Basin Turnouts		
Electrical System		
Utility Voltage	24 VDC	Solar
Transformers	N/A	
Switchgear	N/A	
Distribution	N/A	
Generator	N/A	
Instrumentation and Control System		
HMI Workstation	N/A	
RTU	1 unit	
PLC	1 unit	
I/O Hub	1 unit	
Radio Transmitter	4 units	

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
RP-1 1050 Pump Station				
Electrical System	3	3	3	4
Instrumentation and Control System	3	3	3	3
1050 to 930 PRV				
Electrical System	2	3	3	3
Instrumentation and Control System	3	3	3	3
Ely Basin Turnouts				
Electrical System	3	4	3	3
Instrumentation and Control System	3	3	3	3

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

RP-1 1050 Pump Station:

- **Electrical System**
  RP-1 has three emergency diesel generators, and TP-1 has one emergency diesel generator to produce an effective electrical load of 3.5 MW. RP-1 has a varying electrical demand ranging from 3.0 MW to as high as 4.8 MW, depending on the amount of recycled water pumped. Therefore, RP-1 typically does not have the emergency generation capability to power the three recycled water pump stations located at the facility. Normally, the 1050 pump station supplies utility water for RP-1. Utility water is critical to maintain operation of the facility. Project EN22003 will address this issue.

1050 to 930 PRV Station:
No issues requiring immediate attention

Ely Basin Turnout:
No issues requiring immediate attention

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
RP-1 1050 Pump Station		
Electrical System	2004	
Instrumentation and Control System	2004 2008	
1050 to 930 PRV		
Electrical System	2011	
Instrumentation and Control System	2011	
Ely Basin Turnouts		
Electrical System	2005	
Instrumentation and Control System	2005	

* Appendix B – Condition Assessment Reports

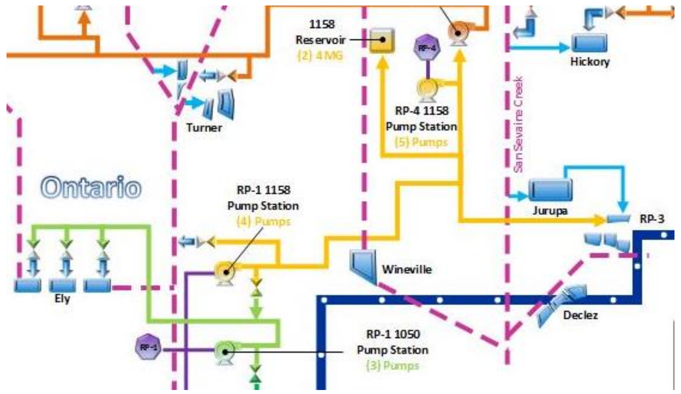
Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – RW

1158 Pressure Zone

1. Asset Profile



1158 Reservoirs
The 1158 reservoirs provide recycled water supply to the 1299 pump station suction header and the 1158 pressure zone. The 1158 reservoirs are located at the intersection of Etiwanda Ave. and 6th St. in the City of Rancho Cucamonga within the GenON Power Generation Facility. Each 1158 reservoir has a design capacity of 4 million gallons (MG), a diameter of 145 feet, and a maximum water surface level of 34 feet, and each is equipped with a level transmitter, flow meter, and altitude valve. The 1158 reservoirs are normally operated between 4 feet and 32 feet, providing an operational capacity of 3.5 MG.

RP-4 1158 Pump Station
The RP-4 1158 pump station provides recycled water to the 1299 pump station suction header, to 1158 reservoirs, and to the 1158 pressure zone for direct use by the City of Fontana and the City of Ontario. The pump station is composed of five pumps:

- Three 200 hp vertical-turbine, VFD-driven, 2,500 gpm pumps
- Two 300 hp vertical-turbine, VFD-driven, 7,200 gpm pumps

The RP-4 1158 pump station is automatically controlled to maintain the level in the RP-4 effluent wet well structure.

RP-1 1158 Pump Station
The RP-1 1158 pump station provides recycled water to the 1299 pump station suction header, to 1158 reservoirs, and to the 1158 pressure zone for direct use by the City of Fontana and the City of Ontario. The pump station is composed of four 400 hp vertical-turbine, VFD-driven, 2,700 gpm pumps.

The RP-1 1158 pump station is automatically controlled to cycle pumps on and off to maintain a time-of-day level set point of the 1158 reservoirs. In addition, the pumps can automatically be switched to VFD control to maintain the RP-1 effluent wet well level when a low level setting is reached.

1158 Pipelines

- *RP-4 Outfall Pipeline* – 25,200 LF of 42-inch pipeline from RP-4 to the intersection of DuPont Ave. and Jurupa St., 15,000 LF of 36-inch pipeline from DuPont Ave. and Jurupa St. to the intersection of Archibald Ave. and Philadelphia Ave., and 4,200 LF of 42-inch pipeline from Archibald Ave. and Philadelphia Ave. to RP-1.
- *1158 Reservoir Pipeline* – 4,200 LF of 48-inch pipeline from RP-4 to the 1158 Reservoirs.
- *Wineville Pipeline* – 5,400 LF of 24-inch pipeline along Wineville Ave. from Airport Dr. to Jurupa St., 8,000 LF of 36-inch pipeline along Francis Street from Jurupa St. to Etiwanda Ave., 8,300 LF of 36-inch pipeline along Marlay Avenue from Etiwanda Ave. to Banana Ave., 2100 LF of 36-inch pipeline along Banana Avenue from Marlay Ave. to Chaparral Dr., and 7,400 LF of 36-inch pipeline along the south side of Chaparral Drive from Banana Ave. to Hemlock Ave.

1158 to 1050 Pressure Reducing Valve (PRV)
The 1158 to 1050 PRV is located at RP-1 and used to transfer excess recycled water from the 1158 pressure zone to the 1050 pressure zone when the 1158 reservoirs reach a high level set point. The system includes a 16-inch Cla-Val PRV and 24-inch magnetic flow meter. The system has an operating flow range from 300 gpm to 17,000 gpm.

RP-4 Energy Displacement Valves (EDV)
The RP-4 EDVs are located at RP-1 and used to discharge excess recycled water when the 1158 reservoirs reach a high level set point. The excess recycled water is treated through the RP-1 north dechlorinating structure before being discharged to the Cucamonga Channel. The turnout includes two 16-inch motor-operated globe-style EDVs, flow meter, and bypass pipeline. Each EDV has an operating flow range from 500 gpm to 11,000 gpm.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
1158 Reservoirs	2 @ 4 MG	3.5 MG (Op. Cap.)
RP-4 1158 Pumps	3 @ 2,500 gpm 2 @ 7,200 gpm	VFD VFD
RP-1 1158 Pumps	4 @ 2,700 gpm	VFD
RP-4 Outfall Pipeline	42-inch – 25,900 gpm 36-inch – 19,000 gpm	6.0 ft/s mv
1158 Reservoir Pipeline	33,800 gpm	6.0 ft/s mv
Wineville Pipeline	8,500 gpm	6.0 ft/s mv
1158 to 1050 PRV	300 – 17,000 gpm	
RP-4 EDVs	2 @ 500–11,000 gpm	

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
1158 Reservoirs	1	3	3	1
RP-4 1158 Pumps	3	3	3	4
RP-1 1158 Pumps	3	5	5	4
RP-4 Outfall Pipeline	3	3	3	4
1158 Reservoir Pipeline	2	2	2	2
Wineville Pipeline	2	3	3	2
1158 to 1050 PRV	2	2	2	3
RP-4 EDVs	3	2	2	3

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

1158 Reservoirs
No issues requiring immediate attention.

It is recommended that the annual monitoring testing is performed at the reservoirs highest operating level.

RP-4 1158 Pumps
No issues requiring immediate attention.

RP-1 1158 Pumps
Limited capacity of 14.8 MGD, an expansion is needed to utilize all water treated at RP-1 and distribute into the recycled water system. Project EN14042 will address this issue.

The VFD manufacturer no longer supports this equipment. Maintenance is running the VFD till end of useful life and then when will replace each VFD through Maintenance. No project needed to address this issue.

RP-4 Outfall Pipeline
In 2004, the RP-4 outfall pipeline was converted from a gravity pipeline to a pressure pipeline to create the 1270 recycled water pressure zone. Pressure at RP-1 was normally in excess of 200 psi, which is within the pressure class of the pipeline; however, multiple joint failures of the 42-inch pipeline have occurred, requiring emergency repairs to the system. In late 2008, the pipeline was converted to the 1158 recycled water pressure zone.

A condition assessment may be warranted as a result of the number of pipeline failures. A condition assessment should be scheduled in 2016 to assess any potential project requirements.

1158 Reservoir Pipeline
A condition assessment in 2014 identified that one of the three test stations functioning and there was uncertainty determining if there were any signs of corrosion. It was also identified that soil is "Negligible Corrosivity." A potential project is needed to repair these issues.

Wineville Pipeline
No issues requiring immediate attention.

1158 to 1050 PRV
No issues requiring immediate attention.

RP-4 EDVs
No issues requiring immediate attention.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
1158 Reservoirs	2008	2014 Report
RP-4 1158 Pumps	2004 2008	
RP-1 1158 Pumps	2004 2006 2008	
RP-4 Outfall Pipeline	1998	Schedule for 2015
1158 Reservoir Pipeline	2004	2014 Report
Wineville Pipeline	2004	
1158 to 1050 PRV	2011	
RP-4 EDVs	1998 2005	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
1158 Reservoir Pipeline	1158 Reservoir Pipeline Cathodic Protection	Repair 1158 reservoir pipeline cathodic protection test stations.
RP-4 Outfall Pipeline	1158 Pipeline Surge Risk Analysis and Condition Assessment	Conduct a risk analysis and condition assessment to identify potential project requirements, and the project will repair the 1158 and 1050 surge tanks.

Asset Management System Summary – RW

Auxiliary Systems – 1158 Pressure Zone

1. Asset Profile

RP-4 1158 Pump Station

- *Electrical System – The electrical energy to power the RP-4 1158 pump station is obtained from the local electrical grid (SCE) and from onsite energy generation (wind and emergency generators). The solar and wind assets are owned and operated by private firms as part of power purchase agreements. The electrical feed from the grid is composed of a 12 kV feeder to the power panel switch gear, where transformers and switchgear are located to distribute electrical energy throughout the facility. A single line diagram of the RP-4 electrical system is shown in Appendix B. The RP-4 treatment facility has one 2.0 MW diesel generator located in the northern portion of the facility; however, the generator was not designed to maintain operation of the recycled water pump stations during a power failure.*
- *Instrumentation and Control System – An extensive array of instruments is used to monitor and control the processes for the RP-4 1158 pump station. All the processes of the pump station are observed and controlled by a local PLC system. Local control wiring is fed from the individual pieces of equipment to an I/O hub and PLC in the RP-4 1158 pump station electrical room. Fiber optic cable is then used to connect the local PLC to the RP-4 server workstation for remote access.*

RP-1 1158 Pump Station

- *Electrical System – The electrical energy to power the RP-1 1158 pump station is obtained from the RP-1 treatment facility, which receives power from the local electrical grid (SCE) and from onsite energy generation (solar, fuel cell, and emergency generators). The solar and fuel cell assets are owned and operated by private firms as part of power purchase agreements. The electrical feed from the grid is composed of a 12 kV feeder to the RP-1 power reliability building (PRB), where transformers and switchgear are located to distribute electrical energy throughout the facility. TP-1 and the RP-1 1158 pump station are powered through the H9 breaker. A single line diagram of the RP-1 1158 pump station electrical system is shown in Appendix B. The RP-1 treatment facility has three 1.25 MW diesel generators located in the PRB, and TP-1 has one 670 kW diesel generator; however, these generators were not designed to maintain operation of the recycled water pump stations during a power failure.*
- *Instrumentation and Control System – An extensive array of instruments is used to monitor and control the processes for the RP-1 1158 pump station. All the processes of the pump station are observed and controlled by a local PLC system. Local control wiring is fed from the individual pieces of equipment to an I/O hub and PLC in the 1158 and 1050 pump station electrical room. Fiber optic cable is then used to connect the local PLC to the RP-1 server workstation for remote access and transition of control data into the RP-1 SCADA system.*

1158 Reservoirs

- *Electrical System – The electrical energy to power the 1158 reservoirs is obtained from the local electrical grid (SCE), which is composed of a 120 V feeder to a local control panel on 6th Street. A single line diagram of the RP-1 1158 pump station electrical system is shown in Appendix B. The 1158 reservoirs do not have emergency power generation in case of power failure.*
- *Instrumentation and Control System – Level, flow, and valve position are monitored at the 1158 reservoirs. Local control wiring is fed from the individual pieces of equipment to an I/O hub and PLC in the 1158 reservoir local control panel. Fiber optic cable is then used to connect the local PLC to the RP-4 server workstation for remote access.*

1158 to 1050 PRV

- *Electrical System – The electrical energy to power the 1158 to 1050 PRV is looped powered through the 1158 and 1050 pump station PLC. A single line diagram of the 1158 to 1050 PRV electrical system is shown in Appendix B. The 670 kW TP-1 diesel generator will power the 1158 pump station and 1050 pump station PLC during a power failure, since the power draw to operate this system is negligible.*
- *Instrumentation and Control System – The 1158 to 1050 PRV consists of a 16-inch Cla-Val PRV with position indication and control and a 24-inch flow meter. All of the processes of the PRV are observed and controlled by the 1158 and 1050 pump station PLC system. Local control wiring is fed from the individual pieces of equipment to an I/O hub and PLC in the 1158 and 1050 pump station electrical room. Fiber optic cable is then used to connect the local PLC to the RP-1 server workstation for remote access and transition of control data into the RP-1 SCADA system.*

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
RP-4 1158 Pump Station		
Electrical System		
Utility Voltage	12 kV	
Transformers	4 @ 12 kV to 480 V	
Switchgear	1 @ 480 V	
Distribution	2 @ 480 V	MCCs
Generator	1 @ 2,000 kW 2,847 Bhp	Small Pumps
Instrumentation and Control System		
HMI Workstation	1 unit	
RTU	N/A	
PLC	1 unit	PLC 5
I/O Hub	1 unit	
Radio Transmitter	1 unit	RP-4
RP-1 1158 Pump Station		
Electrical System		
Utility Voltage	12 kV	
Transformers	2 @ 12 kV to 480 V	
Switchgear	2 @ 480 V	
Distribution	1 @ 480 V	MCCs
Generator	N/A	
Instrumentation and Control System		
HMI Workstation	1 unit	
RTU	N/A	
PLC	1 unit	
I/O Hub	1 unit	
Radio Transmitter	1 unit	RP-1
1158 Reservoirs		
Electrical System		
Utility Voltage	120 V	
Transformers	N/A	
Switchgear	N/A	
Distribution	N/A	
Generator	N/A	
Instrumentation and Control System		
HMI Workstation	N/A	
RTU	N/A	
PLC	1 unit	
I/O Hub	1 unit	PLC 5C
Radio Transmitter	1 unit	RP-4
1158 to 1050 PRV		
Electrical System		
Utility Voltage	120 V	PLC Loop
Transformers	N/A	
Switchgear	N/A	
Distribution	N/A	
Generator	1 @ 670 kW 896 Bhp	TP-1
Instrumentation and Control System		
HMI Workstation	1 unit	
RTU	N/A	
PLC	1 unit	
I/O Hub	1 unit	
Radio Transmitter	1 unit	RP-1

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
RP-4 1158 Pump Station				
Electrical System	3	3	3	4
Instrumentation and Control System	3	3	3	3
RP-1 1158 Pump Station				
Electrical System	3	3	3	4
Instrumentation and Control System	3	3	3	3
1158 Reservoirs				
Electrical System	3	3	3	3
Instrumentation and Control System	3	3	3	3
1158 to 1050 PRV				
Electrical System	2	3	3	3
Instrumentation and Control System	3	3	3	3

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

RP-4 1158 Pump Station:

- **Electrical System**
  RP-4 has one 2.0 MW emergency diesel generator. The generator can produce only enough power to reliably power the RP-4 1158 small pumps, reducing the overall capacity of the pump station. The RP-4 1158 pump station is the only discharge location for the facility; therefore, a utility power failure will reduce the discharge capacity for the facility. Project EN22003 will address this issue.

RP-1 1158 Pump Station

- **Electrical System**
  RP-1 has three emergency diesel generators, and TP-1 has one emergency diesel generator to produce an effective electrical load of 3.5 MW. RP-1 has a varying electrical demand, ranging from 3.0 MW to as high as 4.8 MW depending on the amount of recycled water pumped. Therefore, RP-1 typically does not have the emergency generation capability to power the three recycled water pump stations located at the facility. Project EN22003 will address this issue.

  Project EN13048 will provide a second 12kV feeder to TP-1 to support the RP-1 1158 pump station.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
RP-4 1158 Pump Station		
Electrical System	2004 2008	
Instrumentation and Control System	2004 2008	
RP-1 1158 Pump Station		
Electrical System	2004 2006	
Instrumentation and Control System	2004 2008	
1158 Reservoirs		
Electrical System	2008	
Instrumentation and Control System	2008	
1158 to 1050 PRV		
Electrical System	2011	
Instrumentation and Control System	2011	

* Appendix B – Condition Assessment Reports

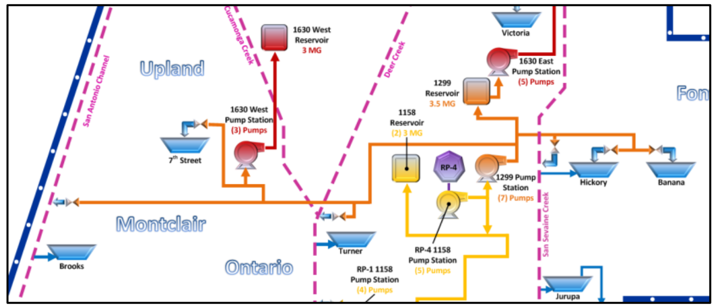
Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – RW

1299 Pressure Zone

1. Asset Profile



1299 Reservoir
The 1299 reservoir provides recycled water supply to the 1630 east pump station suction header and the 1299 pressure zone. The 1299 reservoir is located at the intersection of East Ave. and Baseline Ave. in the City of Rancho Cucamonga on an existing Cucamonga Valley Water District (CVWD) potable water reservoir site. The 1299 reservoir has a design capacity of 3.5 million gallons (MG), a diameter of 165 feet, and a maximum water surface level of 22 feet, and is equipped with a level transmitter. The 1299 reservoir is normally operated between 4 feet and 20 feet, providing an operational capacity of 2.6 MG.

RP-4 1299 Pump Station
The RP-4 1299 pump station provides recycled water to the 1299 pressure zone for direct use by CVWD, Monte Vista Water District (MVWD), the City of Fontana, the City of Ontario, and the City of Upland, and for groundwater recharge at Brooks Basin, 8th St. Basin, Turner Basin, Hickory Basin, Banana Basin, Jurupa Basin, and RP-3 Basin. The pump station is composed of seven pumps:

- Two 350 hp horizontal-split case, VFD-driven, 4,185 gpm pumps
- Five 350 hp horizontal-split case, VFD-driven, 4,600 gpm pumps

The 1299 pump station is automatically controlled to cycle pumps on and off to maintain a time-of-day level set point of the 1299 reservoir.

1299 Pipelines

- *Etiwanda Pipeline* – 4,100 LF of 36-inch pipeline along Etiwanda Ave. from RP-4 to Whittram Ave.
- *North Etiwanda Pipeline* – 1,800 LF of 42-inch pipeline along Etiwanda Ave. from Whittram Ave. to Arrow Route.
- *Whittram Avenue Pipeline* – 7,500 LF of 16-inch along Whittram Ave. from Etiwanda Ave. to Banana Basin.
- *1299 Zone Recycled Water Pipeline* – 12,500 LF of 36-inch pipeline from the termination of the North Etiwanda Pipeline to the 1299 Reservoir.
- *RP-4 West Extension Phase I Pipeline* – 14,200 LF of 30-inch pipeline along 6th St. from Etiwanda Ave. to Cleveland Ave.
- *RP-4 West Extension Phase II Pipeline* – 10,400 LF of 30-inch pipeline from the termination of the RP-4 West Extension Phase I Pipeline at 6th St. and Cleveland Ave. to Archibald Ave. and 4th St., continuing with an additional 2,200 LF of 24-inch pipeline to 4th St. and Cucamonga Creek.
- *San Antonio Channel Segment A Pipeline* – 14,900 LF of 24-inch pipeline from the termination of the RP-4 West Extension Phase II pipeline at 4th St. and Cucamonga Creek to I St. and Sultana Ave.
- *San Antonio Channel Segment B Pipeline* – 12,200 LF of 30-inch pipeline from the termination of the San Antonio Channel Segment A Pipeline at I St. and Sultana Ave. to San Bernardino Ave. and Benson Ave., continuing with an additional 11,250 LF of 24-inch pipeline to Orchard St. Turnout.
- *7th and 8th St. Pipeline* – 10,500 LF of 16-inch pipeline from 4th St. and Corona Ave. to 8th St. Basin turnout.

Force Main Manifold (FMM) Turnout
The turnout includes two 12-inch motor-operated butterfly valves, a flow meter, and a pressure transmitter to provide recycled water to Hickory Basin and Banana Basin. The turnout is designed for flow rates ranging from 200 gpm to 6,000 gpm.

San Sevaine Channel Turnout
The turnout includes a 10-inch Cla-Val flow control valve, a flow meter, and a pressure transmitter to provide recycled water to San Sevaine Channel. Recycled water discharged in the channel can then be conveyed to Hickory Basin or to Jurupa Basin for groundwater recharge. The turnout is designed for flow rates ranging from 200 gpm to 2,200 gpm.

Turner Basin Turnout
The turnout includes a 10-inch Cla-Val flow control valve, a flow meter, and a pressure transmitter to provide recycled water to Deer Creek. Recycled water discharged in the lined creek can then be conveyed to Turner Basin Nos. 3 and 4 for groundwater recharge. The turnout is designed for flow rates ranging from 300 gpm to 3,500 gpm.

8th St. Basin Turnout
The turnout includes a 12-inch Cla-Val flow control valve, a flow meter, and a pressure transmitter to provide recycled water to 8th St. Basin. The turnout is designed for flow rates ranging from 200 gpm to 3,000 gpm.

Orchard Turnout
The turnout includes a 16-inch Cla-Val flow control valve, a flow meter, and a pressure transmitter to provide recycled water to San Antonio Channel. Recycled water discharged in the channel can then be conveyed to Brooks Basin for groundwater recharge. The turnout is designed for flow rates ranging from 1,000 gpm to 10,000 gpm.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
1299 Reservoir	3.5 MG	2.6 MG
RP-4 1299 Pumps	2 @ 4,185 gpm 5 @ 4,600 gpm	
Etiwanda Pipeline	19,000 gpm	6.0 ft/s mv
North Etiwanda Pipeline	25,900 gpm	6.0 ft/s mv
Whittram Ave. Pipeline	3,750 gpm	6.0 ft/s mv
1299 Zone Recycled Water Pipeline	19,000 gpm	6.0 ft/s mv
RP-4 West Extension Phase I Pipeline	13,200 gpm	6.0 ft/s mv
RP-4 West Extension Phase II Pipeline	30-inch – 13,200 gpm 24-inch – 8,500 gpm	6.0 ft/s mv
San Antonio Channel Segment A Pipeline	8,500 gpm	6.0 ft/s mv
San Antonio Channel Segment B Pipeline	30-inch – 13,200 gpm 24-inch – 8,500 gpm	6.0 ft/s mv
7th & 8th St. Pipeline	3,750 gpm	6.0 ft/s mv
FMM Turnout	200 – 6,000 gpm	Hist. Data
San Sevaine Channel Turnout	200 – 2,200 gpm	Hist. Data
Turner Basin Turnout	300 – 3,500 gpm	Hist. Data
8th St. Basin Turnout	200 – 3,000 gpm	Des. Spec.
Orchard Turnout	1,000 – 10,000 gpm	Des. Spec.

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
1299 Reservoir	1	2	3	2
RP-4 1299 Pumps	4	3	3	3
Etiwanda Pipeline	2	3	2	2
North Etiwanda Pipeline	2	2	2	2
Whittram Ave. Pipeline	2	4	2	2
1299 Zone Recycled Water Pipeline	2	2	2	2
RP-4 West Ext. Phase I Pipeline	2	3	2	2
RP-4 West Ext. Phase II Pipeline	2	3	2	2
San Antonio Channel Segment A	2	3	2	2
San Antonio Channel Segment B	3	3	2	2
7th & 8th St. Pipeline	3	4	3	3
FMM Turnout	3	3	2	3
San Sevaine Channel Turnout	1	1	1	3
Turner Basin Turnout	1	3	3	3
8th St. Basin Turnout	3	3	3	3
Orchard Turnout	1	2	2	3

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

1299 Reservoir
There is only one level transmitter for the reservoir. If the level transmitter fails, it shuts down the entire system. A redundant level transmitter should be installed on the reservoir. These issues should be addressed by the Maintenance Department.

RP-4 1299 Pumps
Impellers wear due to cavitation. Early investigation shows that cast iron material wears prematurely in highly chlorinated water. Further evaluation is needed to determine if a potential project is needed.

Whittram Ave. Pipeline Capacity
At a max velocity of 6 ft/s, the Whittram Ave. pipeline has a capacity of 3,750 gpm. The San Sevaine Channel turnout has a max flow of 2,200 gpm, and the FMM turnout has a maximum flow of 6,000 gpm, which exceeds the Whittram Ave. pipeline max recommended velocity. A project was identified on the FY 2015/16 TYCIP to address this issue, but not project number has been assigned.

7th and 8th St. Pipeline Capacity
At a maximum velocity of 6 ft/s, the 7th and 8th St. pipeline has a capacity of 3,750 gpm. The 8th St. basin turnout has a maximum flow of 3,000 gpm, and the 1630 west recycled water pump station has a maximum flow of 4,000 gpm. Therefore, the 1630 west recycled water pump station and 8th St. basin turnout cannot be operated simultaneously without exceeding the maximum recommended velocity of the pipeline. A project was identified on the FY 2015/16 TYCIP to address this issue, but not project number has been assigned.

San Sevaine Channel Turnout
Condition assessment in 2014 identified the force main, extending from the Jurupa Basin along Mulberry Ave to the RP-3 Basin near Hemlock Ave, has at least two electrical discontinuities between stations 06050 and 07060, and between 10090 and 12120. This needs to be addressed by a potential project to ensure adequate cathodic protection.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
1299 Reservoir	2011	
RP-4 1299 Pumps	2008	
Etiwanda Pipeline	2003	2014 Report
North Etiwanda Pipeline	2008	2014 Report
Whittram Ave. Pipeline	2004	2014 Report
1299 Zone RW Pipeline	2011	2014 Report
RP-4 West Ext. Phase I	2005	2014 Report
RP-4 West Ext. Phase II	C2006	2014 Report
San Antonio Channel Segment A Pipeline	2007	2014 Report
San Antonio Channel Segment B Pipeline	2007	
7th & 8th St. Pipeline	2007	
FMM Turnout	2006	
San Sevaine Channel	2006	2014 Report
Turner Basin Turnout	2006	
8th St. Basin Turnout	2007	
Orchard Turnout	2007	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
1299 Pressure Zone	1299 Pressure Zone Cathodic Protection	Per 2014 Corrpro Report: Repair electrical discontinuities on Jurupa force main, and repair test stations on the North Etiwanda pipeline, Antonio Channel Seg A, RP4 Western Extension Phase 1 and Phase 2.
7th & 8th St. Pipeline and Whittram Ave. Pipeline Capacities	1299 Pressure Zone Pipeline Capacity Upgrades	Upgrade 7th & 8th street pipeline and Whittram Ave pipeline to provide sufficient capacity to not exceed the recommended velocity of the pipeline during peak demand.

Asset Management System Summary – RW/GWR

Auxiliary Systems – 1299 Pressure Zone

1. Asset Profile

RP-4 1299 Pump Station

- *Electrical System* – The electrical energy to power the RP-4 1299 pump station is obtained from the RP-4 treatment facility, which receives power from the local electrical grid (SCE) and from onsite energy generation (wind and emergency generators). The wind assets are owned and operated by a private firm as part of power purchase agreements. The electrical feed from the grid is composed of a 12 kV feeder to the power panel switch gear, where transformers and switchgear are located to distribute electrical energy throughout the facility. A single line diagram of the RP-4 electrical system is shown in Appendix B. The RP-4 treatment facility has one 2.0 MW diesel generator located in the northern portion of the facility; however, the generator was not designed to maintain operation of the recycled water pump stations during a power failure.
- *Instrumentation and Control System* – An extensive array of instruments is used to monitor and control the processes for the RP-4 1299 pump station. All the processes of the pump station are observed and controlled by a local PLC system. Local control wiring is fed from the individual pieces of equipment to an I/O hub and PLC in the RP-4 1299 pump station electrical room. Fiber optic cable is then used to connect the local PLC to the RP-4 server workstation for remote access.

1299 Reservoir

See 1630 East Auxiliary System Summary Sheet.

FMM Turnout

- *Electrical System* – The electrical energy to power the FMM Turnout is obtained from the local electrical grid (SCE). A single line diagram of the FMM Turnout is shown in Appendix B. The turnout does not have emergency power generation in case of power failure.
- *Instrumentation and Control System* – Local control wiring for flow and valve position for the both Hickory and Banana basins is fed back to the remote telemetry unit. The turnout has a 10dB yagi antenna that transmits control data to RP-4, which routes the information to RP-1 to the GWR workstation server for control and remote access.

San Sevaine Channel Turnout

- *Electrical System – The electrical energy to power the San Sevaine Turnout is obtained from the Hickory Basin Rubber Dam Control House, which receives power from the local electrical grid (SCE). A single line diagram of the San Sevaine Channel Turnout and Hickory Basin Rubber Dam Control House is shown in Appendix B. The turnout does not have emergency power generation in case of power failure.*
- *Instrumentation and Control System – Local control wiring for flow and valve position is fed back to the local valve control panel, which then directs the information to a local control panel in the Hickory Basin Rubber Dam Control House. The Control House has a 10dB yagi antenna that transmits control data to RP-4, which routes the information to RP-1 to the GWR workstation server for control and remote access.*

Turner Basin Turnout

- *Electrical System* – The electrical energy to power the Turner Basin Turnout is obtained from the local electrical grid (SCE). A single line diagram of the Turner Basin Turnout is shown in Appendix B. The turnout does not have emergency power generation in case of power failure.
- *Instrumentation and Control System* – Local control wiring for flow and valve position is fed back to a local control panel and PLC. The turnout has a 9dB yagi antenna that transmits control data to RP-4, which routes the information to RP-1 to the GWR workstation server for control and remote access.

8th Street Basin Turnout

- *Electrical System* – The electrical energy to power the 8th Street Basin Turnout is obtained from the local electrical grid (SCE). A single line diagram of the Turner Basin Turnout is shown in Appendix B. The turnout does not have emergency power generation in case of power failure.
- *Instrumentation and Control System* – Local control wiring for flow and valve position is fed back to a local PLC. The turnout has a 9dB yagi antenna that transmits control data to an additional local PLC panel for 8th Street Basin before being transmitted by radio to RP-1 to the GWR workstation server for control and remote access.

Orchard Turnout

- *Electrical System* – The electrical energy to power the Orchard Turnout is obtained from the local electrical grid (SCE). A single line diagram of the Orchard Turnout is shown in Appendix B. The turnout does not have emergency power generation in case of power failure.
- *Instrumentation and Control System* – Local control wiring for flow and valve position as well as pressure are fed back to a local control panel and PLC. The data is transmitted by phone line to the GWR workstation server at RP-1 for control and remote access.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
RP-4 1299 Pump Station		
Electrical System		
Utility Voltage	12 kV	
Transformers	2 @ 12 kV to 480 V	
Switchgear	1 @ 480 V	MCCs
Distribution	1 @ 480 V	
Generator	N/A	
Instrumentation and Control System		
HMI Workstation	1 unit	
RTU	N/A	
PLC	1 unit	PLC 5B
I/O Hub	1 unit	
Radio Transmitter	1 unit	RP-4
FMM Turnout		
Electrical System		
Utility Voltage	120 V	
Transformers	N/A	
Instrumentation and Control System		
HMI Workstation	N/A	
RTU	1 unit	
PLC	N/A	
I/O Hub	1 unit	
Radio Transmitter	1 unit	
San Sevaine Turnout		
Electrical System		
Utility Voltage	480 V	
Transformers	1 @ 480 V to 120 V	
Instrumentation and Control System		
HMI Workstation	N/A	
RTU	N/A	
PLC	N/A	
I/O Hub	1 unit	
Radio Transmitter	1 unit	
Turner Basin Turnout		
Electrical System		
Utility Voltage	120 V	
Transformers	N/A	
Instrumentation and Control System		
HMI Workstation	N/A	
RTU	1 unit	
PLC	1 unit	
I/O Hub	1 unit	
Radio Transmitter	1 unit	
8th Street Basin Turnout		
Electrical System		
Utility Voltage	120 V	
Transformers	N/A	
Instrumentation and Control System		
HMI Workstation	2 units	
RTU	N/A	
PLC	2 units	
I/O Hub	1 unit	
Radio Transmitter	3 units	
Orchard Turnout		
Electrical System		
Utility Voltage	120 V	
Transformers	N/A	
Instrumentation and Control System		
HMI Workstation	1 unit	
RTU	N/A	
PLC	1 unit	
I/O Hub	1 unit	
Radio Transmitter	N/A	

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
RP-4 1299 Pump Station				
Electrical System	2	3	3	4
Instrumentation and Control System	2	3	3	3
FMM Turnout				
Electrical System	3	3	3	3
Instrumentation and Control System	3	3	3	3
San Sevaine Turnout				
Electrical System	3	3	3	3
Instrumentation and Control System	3	3	3	3
Turner Basin Turnout				
Electrical System	3	3	3	3
Instrumentation and Control System	3	3	3	3
8th Street Basin Turnout				
Electrical System	3	3	3	3
Instrumentation and Control System	3	3	3	3
Orchard Turnout				
Electrical System	3	3	3	3
Instrumentation and Control System	3	3	3	3

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

RP-4 1299 Pump Station Emergency Generation

RP-4 has one 2.0 MW emergency diesel generator. The generator can produce only enough power to reliably power the RP-4 1158 small pumps; therefore, it cannot maintain the operation of the 1299 pump station during a power failure. Project EN22003 will address this issue.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
RP-4 1299 Pump Station		
Electrical and I&C	2008	
FMM Turnout		
Electrical and I&C	2006	
San Sevaine Turnout		
Electrical and I&C	2006	
Turner Basin Turnout		
Electrical and I&C	2006	
8th Street Basin Turnout		
Electrical and I&C	2007	
Orchard Turnout		
Electrical and I&C	2007	

* Appendix B – Condition Assessment Reports

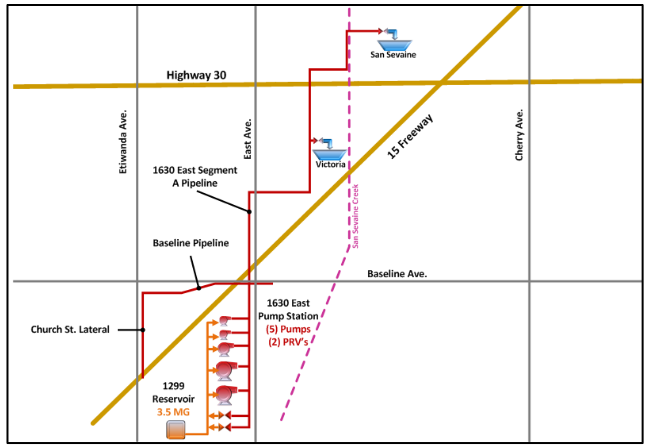
Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – RW/GWR

1630 East Pressure Zone

1. Asset Profile



1630 East Pump Station
The 1630 east pump station provides recycled water to the 1630 east pressure zone for direct use by CVWD and the City of Fontana and for groundwater recharge at Victoria and San Sevaine basins. The pump station is composed of five pumps:

- Two 100 hp vertical-turbine, VFD-driven, 750 gpm pumps
- One 200 hp vertical-turbine, constant speed, 1,500 gpm pump
- Two 400 hp vertical-turbine, constant speed, 3,000 gpm pumps

The 1630 east pump station is automatically controlled using a proportional-integral-derivative controller (PID) to maintain a discharge-pressure set point of 150 psi. In addition, the pump station has two 12-inch pressure-reducing valves (PRV) to transfer recycled water from the 1630 east pressure zone back to the 1299 pressure zone to be used with the future 1630 east reservoir.

1630 East Pipelines

- *Segment A Pipeline* – 11,300 LF of 36-inch pipeline from the 1630 East Pump Station to San Sevaine Turnout.
- *Baseline Pipeline* – 1,650 LF of 24-inch and 30-inch pipeline along Baseline Ave. from Etiwanda Ave. to Heritage Circle.
- *Church Street Lateral* – 2,350 LF of 12-inch pipeline along Etiwanda Ave. from Baseline Ave. to Church St.

Victoria Basin Turnout
The turnout includes an 8-inch Cla-Val flow control valve, a flow meter, and a pressure transmitter to provide recycled water to the groundwater recharge basin. The turnout is designed for flow rates ranging from 200 gpm to 3,000 gpm.

San Sevaine Basin Turnout
The turnout includes a 12-inch Cla-Val flow control valve, a flow meter, and a pressure transmitter to provide recycled water to the groundwater recharge basin. The turnout is designed for flow rates ranging from 400 gpm to 6,700 gpm.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
1630 East Pumps	2 @ 750 gpm 1 @ 1,500 gpm 2 @ 3,000 gpm	VFD Constant Constant
1630 East PRVs	2 @ 10,000 gpm	Need to verify in field
Segment A Pipeline	19,000 gpm	6.0 ft/s max velocity
Baseline Pipeline	13,000 gpm	6.0 ft/s max velocity
Church Street Lateral	2,000 gpm	6.0 ft/s max velocity
Victoria Basin Turnout	200 – 3,000 gpm	
San Sevaine Basin Turnout	400 – 6,700 gpm	

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
1630 East Pumps	2	2	3	2
1630 East PRVs	1	1	2	2
Segment A Pipeline	1	2	1	1
Baseline Pipeline	1	2	2	1
Church Street Lateral	1	2	2	1
Victoria Basin Turnout	1	2	2	2
San Sevaine Basin Turnout	1	1	2	2

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

1630 East Pumps
When both Victoria and San Sevaine basins are not receiving recycled water, the minimum 1630 east pressure zone flow is causing the small 100 hp pumps to operate continuously at minimum speed with zero measurable flow. Further investigation is needed to determine whether programming changes can resolve the issue or whether a small jockey pump may be required. A potential project is needed.

The existing surge tank compressor does not have the capacity to effectively displace the water in the tank after surge events. Multiple failures of the surge tank compressor have been documented and reported to Engineering. Project EN13051 will address these issues.

1630 East PRVs
No issues requiring immediate attention

Segment A Pipeline
No issues requiring immediate attention

A condition assessment in 2014 that the test stations were functioning as intended, but an electrical discontinuity was detected between stations 07010 and 09020, but the soil has "Negligible Corrosivity."

Baseline Pipeline
No issues requiring immediate attention

Church Street Lateral
No issues requiring immediate attention

Victoria Basin Turnout
No issues requiring immediate attention

San Sevaine Basin Turnout
No issues requiring immediate attention

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
1630 East Pumps	2011	
1630 East PRVs	2011	
Segment A Pipeline	2011	2014 Report
Baseline Pipeline	2011	
Church Street Lateral	2011	
Victoria Basin Turnout	2011	
San Sevaine Basin Turnout	2011	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – RW/GWR

Auxiliary Systems – 1630 East Pressure Zone

1. Asset Profile

1630 East Pump Station and 1299 Reservoir

- *Electrical System – The electrical energy to power the 1630 east pump station is obtained from the local electrical grid (SCE). The electrical feed from the grid is composed of a 12 kV feeder to the 1630 east pump station electrical room, where transformers and switchgear are located to distribute electrical energy throughout the pump station. A single line diagram of the 1630 east pump station electrical system is shown in Appendix B. The 1630 east pump station does not have emergency power generation in case of power failure; however, it does have a generator termination cabinet to allow for quick connection of a portable generator.*
- *Instrumentation and Control System – An extensive array of instruments is used to monitor and control the processes for the 1630 east pump station and 1299 reservoir. All the processes of the pump station are observed and controlled by a local PLC system. Local control wiring is fed from the individual pieces of equipment to an I/O hub and PLC in the 1630 east pump station electrical room. Radio is then used to connect the local PLC to the RP-4 server workstation for remote access.*

Victoria Basin Turnout

- *Electrical System – The electrical energy to power the Victoria Basin Turnout is obtained from the local electrical grid (SCE). A single line diagram of the Victoria Basin Turnout is shown in Appendix B. The turnout does not have emergency power generation in case of power failure.*
- *Instrumentation and Control System – Local control wiring for flow and valve position is fed back to a local control panel and PLC, which transmits control data to the Victoria Basin Main remote terminal unit (RTU). The Victoria Basin Main RTU has a radio that transmits control data to RP-4, which routes the information to RP-1 to the GWR workstation server for control and remote access.*

San Sevaine Basin Turnout

- *Electrical System* – The electrical energy to power the Victoria Basin *Turnout is obtained from the local electrical grid (SCE). A single line diagram of the Victoria Basin Turnout is shown in Appendix B. The turnout does not have emergency power generation in case of power failure.*
- *Instrumentation and Control System – Local control wiring for flow and valve position is fed back to a remote I/O hub, which radios control data to the San Sevaine Basin No. 3 RTU. The San Sevaine Basin No. 3 RTU has a radio that transmits control data to RP-4, which routes the information to RP-1 to the GWR workstation server for control and remote access. In addition, there is a San Sevaine Basin Turnout Main RTU that radios information back to RP-4.*

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
1630 East Pump Station		
Electrical System		
Utility Voltage	12 kV	
Transformers	1 @ 12 kV to 480 V	
Switchgear	1 @ 480 V	
Distribution	1 @ 480 V	MCCs
Generator	N/A	
Instrumentation and Control System		
HMI Workstation	1 unit	
RTU	1 unit	
PLC	2 units	
I/O Hub	1 unit	
Radio Transmitter	1 unit	
Victoria Basin Turnout		
Electrical System		
Utility Voltage	120 V	
Transformers	N/A	
Instrumentation and Control System		
HMI Workstation	1 unit	
RTU	1 unit	
PLC	1 unit	
I/O Hub	2 units	
Radio Transmitter	3 units	
San Sevaine Basin Turnout		
Electrical System		
Utility Voltage	120 V	
Transformers	N/A	
Instrumentation and Control System		
HMI Workstation	1 unit	
RTU	2 units	
PLC	2 units	
I/O Hub	3 units	
Radio Transmitter	4 units	

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
1630 East Pump Station				
Electrical System	2	3	3	3
Instrumentation and Control System	3	3	3	3
Victoria Basin Turnout				
Electrical System	2	3	3	3
Instrumentation and Control System	3	3	3	3
San Sevaine Basin Turnout				
Electrical System	2	3	3	3
Instrumentation and Control System	3	3	3	3

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

Electrical System

No issues require specific attention.

Instrumentation and Control System

No issues require specific attention.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
1630 East Pump Station		
Electrical System	2011	
Instrumentation and Control System	2011	
Victoria Basin Turnout		
Electrical System	2011	
Instrumentation and Control System	2011	
San Sevaine Channel Turnout		
Electrical System	2011	
Instrumentation and Control System	2011	

* Appendix B – Condition Assessment Reports

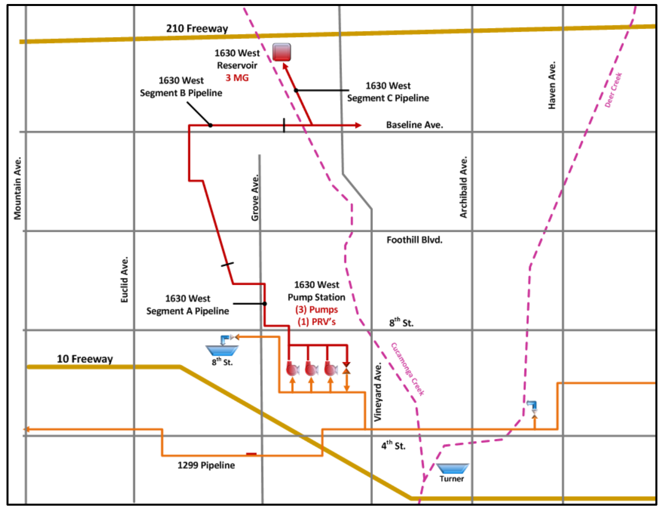
Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – RW/GWR

1630 West Pressure Zone

1. Asset Profile



1630 West Reservoir
The 1630 west reservoir provides recycled water storage for the 1630 west pressure zone. The 1630 west reservoir is located at the intersection of 19th St. and Cucamonga Creek in the City of Rancho Cucamonga on an existing Cucamonga Valley Water District (CVWD) pump station site. The 1630 east reservoir has a design capacity of 3 million gallons (MG), a diameter of 130 feet, and a maximum water surface level of 32 feet, and is equipped with a level transmitter. The 1630 west reservoir is normally operated between 4 feet and 28 feet, providing an operational capacity of 2.4 MG.

1630 West Pump Station
The 1630 west pump station provides recycled water to the 1630 west pressure zone for direct use by CVWD and the City of Upland. The pump station is composed of three 250 hp vertical-turbine, constant-speed, and 2,000 gpm pumps. The 1630 east pump station is automatically controlled to cycle pumps on and off to maintain a time-of-day level set point of the 1630 west reservoir. In addition, the pump station has one 10-inch pressure reducing valve (PRV) to transfer recycled water from the 1630 west pressure zone back to the 1299 pressure zone.

1630 West Pipelines
- *Segment A Pipeline* – 10,500 LF of 24-inch pipeline from the 1630 West Pump Station to Upland Memorial Park.
- *Segment B Pipeline* – 13,000 LF of 24-inch pipeline from Upland Memorial Park to the intersection of 16th St. (Baseline Rd.) and Tanglewood Ave.
- *Segment C Pipeline* – 800 LF of 24-inch pipeline and 3,100 LF of 30-inch pipeline along Baseline Rd. from Tanglewood Ave. to Vineyard Ave. Segment C Pipeline includes an additional 4,400 LF of 30-inch pipeline along Cucamonga Creek from Baseline Rd. to the 1630 west reservoir.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
1630 West Reservoir	3 MG	2.4 MG (Op. Cap.)
1630 West Pumps	3 @ 2,000 gpm	Constant
1630 West PRV	300 – 3,000 gpm	Need to verify in field
Segment A Pipeline	8,500 gpm	6.0 ft/s max velocity
Segment B Pipeline	8,500 gpm	6.0 ft/s max velocity
Segment C Pipeline	24-inch – 8,500 gpm 30-inch – 13,200 gpm	6.0 ft/s max velocity

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
1630 West Reservoir	1	1	1	1
1630 West Pumps	1	1	4	4
1630 West PRV	1	3	3	2
Segment A Pipeline	1	1	1	1
Segment B Pipeline	1	1	1	1
Segment C Pipeline	1	1	1	1

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

1630 West Reservoir
The 1630 West Reservoir site uses city water (`$6k annually) for irrigation purposes. A potential project is needed to install a small RW booster pump station at the reservoir site, so we could use RW for irrigation and not city water.

1630 West Pumps
Operations has noticed surge in both the 1299 and 1630 pressure zones when the 1630 west pumps are started or stopped. The surge can be in excess of 40 psi from standard operating conditions. The 1630 west surge tank and pump start controls are being reviewed to see if this condition can be eliminated with existing equipment. Project EN15055 will address this issue.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
1630 West Reservoir	2012	
1630 West Pumps	2012	
1630 West PRV	2012	
Segment A Pipeline	2012	
Segment B Pipeline	2012	
Segment C Pipeline	2012	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – RW/GWR

Auxiliary Systems – 1630 West Pressure Zone

1. Asset Profile

1630 West Pump Station

- *Electrical System* – The electrical energy to power the 1630 west pump station is obtained from the local electrical grid (SCE). The electrical feed from the grid is composed of a 12 kV feeder to the 1630 east pump station electrical room, where transformers and switchgear are located to distribute electrical energy throughout the pump station. A single line diagram of the 1630 west pump station electrical system is shown in Appendix B. The 1630 west pump station does not have emergency power generation in case of power failure; however, it does have a generator termination location in the MCC to allow for quick connection of a portable generator.
- *Instrumentation and Control System* – An extensive array of instruments is used to monitor and control the processes for the 1630 west pump station. All of the processes of the pump station are observed and controlled by a local PLC system. Local control wiring is fed from the individual pieces of equipment to an I/O hub and PLC in the 1630 west pump station electrical room. Radio is then used to connect the local PLC to the RP-4 server workstation for remote access.

1630 West Reservoir

- *Electrical System – The electrical energy to power the 1630 west reservoir is obtained from the local electrical grid (SCE). A single line diagram of the 1630 west reservoir is shown in Appendix B. The reservoir does not have emergency power generation in case of power failure.*
- *Instrumentation and Control System – Local control wiring for level and valve position are fed back to a local control panel and PLC. The RTU has a radio that transmits control data to RP-4, which routes the information to RP-1 for control and remote access.*

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
1630 West Pump Station		
Electrical System		
Utility Voltage	12 kV	
Transformers	1 @ 12 kV to 480 V 1 @ 12 kV to 120 V	
Switchgear	1 @ 480 V	
Distribution	1 @ 480 V	MCCs
Generator	N/A	
Instrumentation and Control System		
HMI Workstation	1 unit	
RTU	N/A	
PLC	1 unit	
I/O Hub	1 unit	
Radio Transmitter	1 unit	
1630 West Reservoir		
Electrical System		
Utility Voltage	480	
Transformers	1 @ 480 V to 120 V	
Switchgear	N/A	
Distribution	N/A	MCCs
Generator	N/A	
Instrumentation and Control System		
HMI Workstation	N/A	
RTU	1 unit	
PLC	1 unit	
I/O Hub	1 unit	
Radio Transmitter	1 unit	

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
1630 West Pump Station				
Electrical System	2	3	3	3
Instrumentation and Control System	3	3	3	3
1630 West Reservoir				
Electrical System	2	3	3	3
Instrumentation and Control System	3	3	3	3

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

Electrical System
No issues require specific attention.

Instrumentation and Control System
No issues require specific attention.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
1630 West Pump Station		
Electrical System	2012	
Instrumentation and Control System	2012	
1630 West Reservoir		
Electrical System	2012	
Instrumentation and Control System	2012	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

<u>End of System Summary</u>

Asset Management System Summary – Groundwater Recharge System

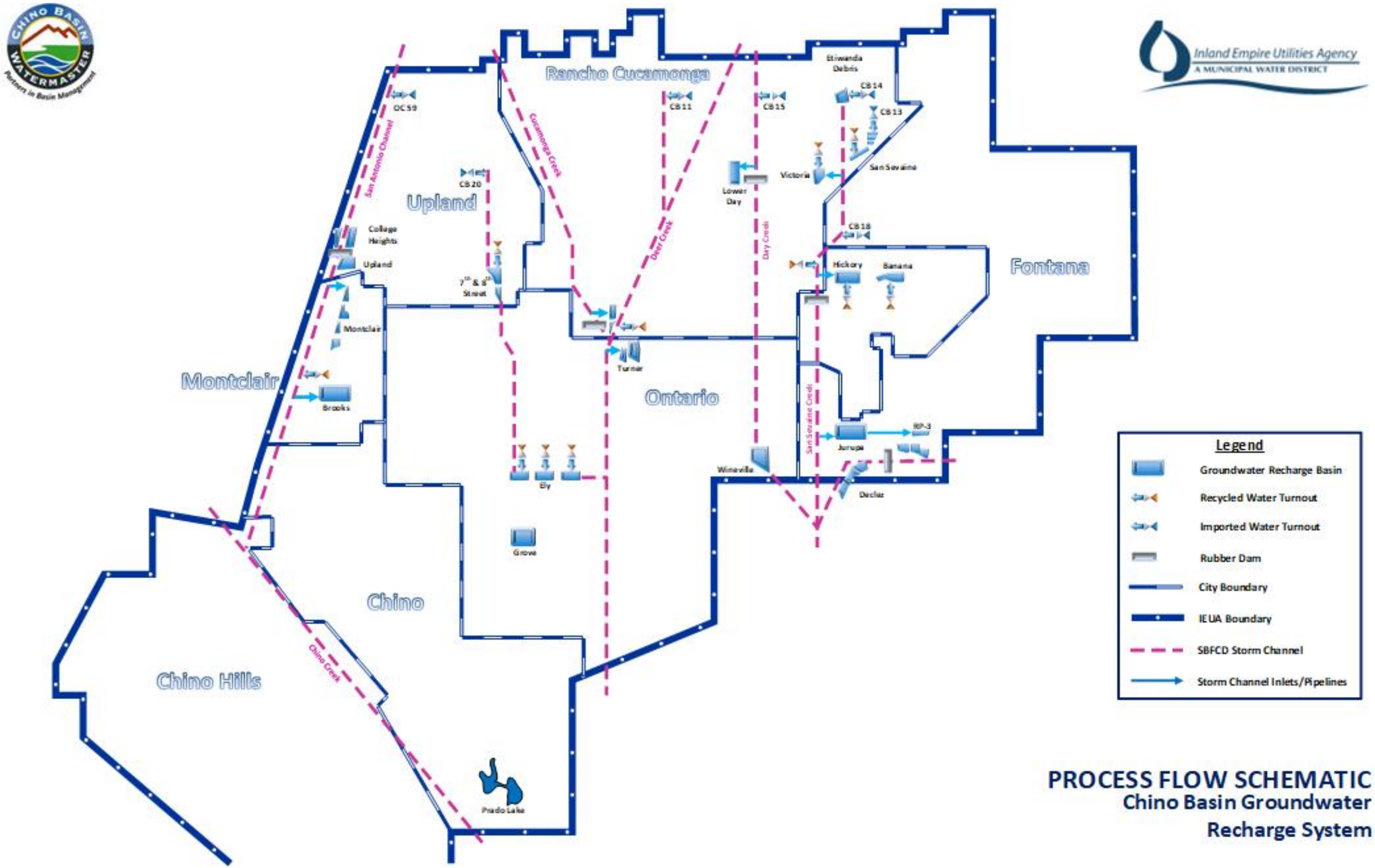


Figure 7-8: Groundwater Recharge Systems (GWR) – Schematic

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Asset Management System Summary – GWR
7th Street & 8th Street Basin
1. Asset Profile

PROCESS FLOW SCHEMATIC
7th Street & 8th Street Basins

7th Street Basin
The 7th Street Basin is owned by the San Bernardino County Flood Control District (SBCFCD) and is located on the border of the City of Ontario and the City of Upland, near the intersection of 7th Street and Grove Avenue. The 7th Street Basin receives flow from the 8th Street Basin and has the ability to discharge flow to the West Cucamonga Creek. The 7th Street Basin has an approximate size of 6.5 acres and an approximate sidewall depth of 11 feet from a floor elevation of 1123' to an outfall pipe invert elevation of 1134' equating to 54.6 AF of storage. The 7th Street Basin includes a 36" automated sluice gate for discharge to the West Cucamonga Creek and a level transmitter.

8th Street Basin
The 8th Street Basin is owned by the SBCFCD and is located on the border of the City of Ontario and the City of Upland, near the intersection of 8th Street and Grove Avenue. The 8th Street Basin is comprised of two cells: the North Cell and the South Cell.

- *8th Street Basin North Cell* – The 8th Street Basin North Cell receives stormwater and imported water from the West Cucamonga Creek, stormwater from a local storm drain system, and recycled water from the 8th Street Basin Recycled Water Turnout. The 8th Street Basin North Cell has an approximate size of 8.3 acres and an approximate sidewall depth of 7 feet from a floor elevation of 1134' to an 8th Street Basin South Cell overflow structure at an elevation of 1141' equating to 52.6 AF of storage. The 8th Street Basin North Cell includes a 54" manual sluice gate for discharge to the 8th Street Basin South Cell and a level transmitter.
- *8th Street Basin South Cell* – The 8th Street Basin South Cell receives flow from the 8th Street Basin North Cell. The 8th Street Basin South Cell has an approximate size of 6.3 acres and an approximate sidewall depth of 8 feet from a floor elevation of 1133' to a 7th Street Basin overflow structure at an elevation of 1141' equating to 38.0 AF of storage. The 8th Street Basin South Cell includes a 48" automated sluice gate for discharge to the 7th Street Basin, staff gauges, and a level transmitter.

8th Street Basin Recycled Water Turnout
The 8th Street Basin Recycled Water Turnout is located to the north of the 8th Street Basin. The turnout includes a 12" Cla-Val flow control valve, flow meter, and pressure transmitter to provided recycled water to 8th St. Basin. The turnout is designed for flow rates ranging from 200 gpm to 3,000 gpm.

CB 20 MWD Imported Water Turnout
The CB 20 MWD Imported Water Turnout is located near the intersection of Winston Street and 18th Street in the City of Upland. The turnout includes a 24" Cla-Val flow control valve with flow measurement and a pressure transmitter to provided imported water to a local storm drain system that connects to the West Cucamonga Creek. The turnout is designed for flow rates ranging from 1,000 gpm to 9,000 gpm.

Electrical System

- *Basin* – The electrical energy to power the 7th Street Basin and the 8th Street Basin is obtained from the local electrical grid (SCE) through a meter on 7th Street. The system utilizes 120v power, does not have any transformers, and does not have emergency power generation.
- *Recycled Water Turnout* – The electrical energy to power the 8th Street Basin Recycled Water Turnout is obtained from the local electrical grid (SCE) through a meter on 8th Street. The system utilizes 120v power, does not have any transformers, and does not have emergency power generation.
- *Imported Water Turnout* – The electrical energy to power the CB 20 MWD Imported Water Turnout is obtained from the local electrical grid (SCE) through a meter on 18th Street. The system utilizes 120v power, does not have any transformers, and does not have emergency power generation.

Instrumentation and Control System

- *Basin* – Local control wiring for valve position and basin levels are fed back to a local PLC. The basin PLC has a radio antenna that transmits control data to the Almond Repeater and then to RP-1 to the GWR workstation server for control and remote access.
- *Recycled Water Turnout* – Local control wiring for flow and valve position are fed back to a local PLC. The turnout PLC has a 9dB yagi antenna that transmits control data the local PLC panel for the 8th Street Basin to be further transmitted to the GWR workstation.
- *Imported Water Turnout* – Local control wiring for flow and valve position are fed back to a local PLC. The turnout PLC has a radio antenna that transmits control data to the Almond Repeater and then to RP-1 to the GWR workstation server for control and remote access.

2. Capacity Profile
Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
7th Street Basin	*Basin* Area: 6.5 acres Depth: 11 ft Volume: 54.6 AF *Gates* 36" sluice gate	Automated
8th Street Basin North Cell	*Basin* Area: 8.3 acres Depth: 7 ft Volume: 52.6 AF *Gates* 54" sluice gate	Manual
8th Street Basin South Cell	*Basin* Area: 6.3 acres Depth: 8 ft Volume: 38.0 AF *Gates* 48" sluice gate	Automated
8th Street Basin Recycled Water Turnout	*Flow Control Valve* 12" @ 200–3,000 gpm 12" Flow Meter *Valves* 16" butterfly	Manual
CB 20 MWD Imported Water Turnout	*Flow Control Valve* 24" @ 1,000-9,000 gpm	
Electrical Instrumentation	Utility Voltage: 120 v Transformers: N/A HMI: 2 unit RTU: 1 unit PLC: 2 unit I/O Hub: 1 unit Radio: 3 unit	

3. Asset Ratings
Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
7th St. Basin				
Basin	2	NA	2	NA
Gates	2	NA	2	NA
8th St. Basin				
North Cell Basin	2	NA	2	NA
North Cell Gates	4	NA	3	NA
South Cell Basin	2	NA	2	NA
South Cell Gates	2	NA	2	NA
Recycled Water Turnout Flow Control Valve	4	NA	4	NA
Recycled Water Turnout Valves	3	NA	3	NA
CB 20 MWD Imported Water Turnout Flow Control Valve	3	NA	4	NA
Electrical & Instrumentation	4	NA	4	NA

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation
8th St. Basin North Cell Gates
The two gates were not installed with stainless steel hardware, so the hardware is failing prematurely and needs to be replaced. The bolts are imbedded in concrete. Maintenance will address this issue and a potential project is not needed at this time.

8th Street Basin Recycled Water Turnout
The 8th St. Basin Recycled Water Turnout discharges into an unlined portion of the West Cucamonga Creek causing erosion of the embankments, unwanted vegetation growth, and has provided a location for a homeless encampment. The discharge piping should be extended further into the 8th Street Basin North Cell to prevent these issues. A potential project will address these issues.

Electrical & Instrumentation
The level transmitters for the 8th St. Basin North Cell, 8th St. Basin South Cell, and 7th St. Basin do not extend to the bottom of the basin floor; and therefore, do not provide an accurate measurement of the level. The wiring and conduit should be extended to allow for relocation of the pressure transmitter to the bottom of the basin floor. A potential project will address these issues.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
7th St. Basin	2004	
8th St. Basin North Cell	2004	
8th St. Basin South Cell	2004	
8th St. Basin Recycled Water Turnout	2007	
CB 20 MWD Imported Water Turnout	2009	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – GWR
Banana Basin
1. Asset Profile

PROCESS FLOW SCHEMATIC
Banana Basin

Banana Basin
Banana Basin is owned by the San Bernardino County Flood Control District (SBCFCD) and is located in unincorporated San Bernardino County, near the intersection of Whittram Avenue and Banana Avenue. Banana Basin receives stormwater from the West Fontana Channel, stormwater from a local storm drain system, and recycled water from the Force Main Manifold (FMM) Recycled Water Turnout. Banana Basin has an approximate size of 7.4 acres and an approximate sidewall depth of 7 feet from a floor elevation of 1136' to the West Fontana Channel overflow structure at an elevation of 1143' equating to 42.4 AF of storage. The Banana Basin has staff gauges, a level transmitter, and a 36" automated sluice gate for discharge to the West Fontana Channel, which feeds Hickory Basin.

Force Main Manifold (FMM) Recycled Water Turnout
The FMM Recycled Water Turnout is located south of the intersection of Whittram Avenue and Mulberry Ave, approximately 0.5 miles west of Banana Basin. The turnout includes two 12" motor operated butterfly valves, flow meter, and pressure transmitter and provides recycled water to Hickory Basin and to Banana Basin. The turnout is designed for flow rates ranging from 200 gpm to 6,000 gpm.

Electrical System

2. *Basin* – The electrical energy to power Banana Basin is obtained from the local electrical grid (SCE) through a meter on Whittram Avenue The system utilizes 120v power, does not have any transformers, and does not have emergency power generation.
3. *Recycled Water Turnout* – The electrical energy to power the FMM Recycled Water Turnout is obtained from the local electrical grid (SCE) through a meter on Whittram Avenue The system utilizes 120v power, does not have any transformers, and does not have emergency power generation.

Instrumentation and Control System

4. *Basin* – Local control wiring for valve position and basin level are fed back to a local PLC. The basin PLC has a radio antenna that transmits control data to RP-4, which routes the information to RP-1 to the GWR workstation server for control and remote access.
5. *Recycled Water Turnout* – Local control wiring for flow and valve position for both Hickory and Banana Basins are fed back to the remote telemetry unit. The turnout has a 10dB yagi antenna that transmits control data to RP-4, which routes the information to RP-1 to the GWR workstation server for control and remote access.

6. Capacity Profile
Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Banana Basin	*Basin* Area: 7.4 acres Depth: 7 ft Volume: 42.4 AF *Gates* 36" sluice gate	Automated
FMM Recycled Water Turnout	*Flow Control Valve* 12" @ 200–6,000 gpm 12" Flow Meter *Valves* 10" gate 10" backflow preventer	2 Valves 2 - Manual
Electrical Instrumentation	Utility Voltage: 120 v Transformers: N/A HMI: 1 unit RTU: 1 unit PLC: 1 unit I/O Hub: 1 unit Radio: 2 unit	

7. Asset Ratings
Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Banana Basin				
Basin	3	NA	3	NA
Gates	3	NA	3	NA
FMM Recycled Water Turnout				
Flow Control Valve	3	NA	3	NA
Valves	4	NA	4	NA
Electrical & Instrumentation	4	NA	4	NA

* Ratings as defined in Appendix A; General System Assets

8. Key Issues for Further Investigation
Instrumentation
During high wind events, the radio tower sways in the wind and causes a loss of communication to RP-4. Improvement to the radio should be investigated as part of the GWR Communication System Upgrades Project – EN12019.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Banana Basin	2004	
FMM Recycled Water Turnout	2006	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – GWR
Brooks Basin
1. Asset Profile

PROCESS FLOW SCHEMATIC
Brooks Basin

Brooks Basin
Brooks Basin is owned by the Chino Basin Water Conservation District (CBWCD) and is located in the City of Montclair, near the intersection of Ramona Ave and Brooks Street. Brooks Basin receives stormwater and imported water from the San Antonio Channel, stormwater from a local storm drain system, and recycled water from the Orchard Recycled Water Turnout. Brooks Basin has an approximate size of 9.9 acres and an approximate sidewall depth of 33 feet from a floor elevation of 860' to a State Street Storm Drain inlet pipe invert elevation of 893' equating to 192.0 AF of storage. Brooks Basin includes a 48" automated sluice gate and pipeline for inlet flow from the San Antonio Channel, a 42" automated sluice gate and pipeline for flow from the State Street storm drain inlet, and a basin level transmitter. Several level transmitters occur in monitoring wells, but are no longer needed..

Orchard Recycled Water Turnout
The Orchard Recycled Water Turnout is located at the intersection of the San Antonio Channel and Orchard Street approximately 0.5 miles north of Brooks Basin. The turnout includes a 16" Cla-Val flow control valve, flow meter, and pressure transmitter to provided recycled water to San Antonio Channel. Recycled Water discharged in the channel can then be conveyed to Brooks Basin for groundwater recharge. The turnout is designed for flow rates ranging from 1,000 gpm to 10,000 gpm.

Electrical System
- *Basin* – The electrical energy to power Brooks Basin is obtained from the local electrical grid (SCE) through a meter on Silicon Avenue The system utilizes 120v power, does not have any transformers, and does not have emergency power generation.
- *Recycled Water Turnout* – The electrical energy to power the Orchard Recycled Water Turnout is obtained from the local electrical grid (SCE) through a meter on Orchard Street. The system utilizes 120v power, does not have any transformers, and does not have emergency power generation.

Instrumentation and Control System
- *Basin* – Local control wiring for valve position and basin levels are fed back to a local PLC. The basin PLC has a radio antenna that transmits control data to the Almond Repeater and then to RP-1 to the GWR workstation server for control and remote access.
- *Recycled Water Turnout* – Local control wiring for flow and valve position, and pressure are fed back to a local control panel and PLC. The data is transmitted by phone line to the GWR workstation server at RP-1 for control and remote access.

2. Capacity Profile
Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Brooks Basin	*Basin* Area: 9.9 acres Depth: 33 ft Volume: 192.0 AF *Gates* 48" sluice gate 42" sluice gate	 Automated Automated
Orchard Recycled Water Turnout	*Flow Control Valve* 16" @ 1,000–10,000 16" Flow Meter	gpm
Electrical Instrumentation	Utility Voltage: 120 v Transformers: N/A HMI: 2 unit RTU: N/A PLC: 2 unit I/O Hub: 2 unit Radio: 1 unit	

3. Asset Ratings
Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Brooks Basin				
Basin	3	NA	3	NA
Gates	2	NA	2	NA
Orchard Recycled Water Turnout				
Flow Control Valve	4	NA	4	NA
Electrical & Instrumentation	3	NA	3	NA

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation
Brooks Basin
The eastern access road to the basin floor was never completed when the basin was filled in to allow for the construction of commercial property on the eastern side of the basin. Currently, access to the eastern side of Brooks Basin cannot be obtained from the western access road. The eastern access road should be extended to the basin floor. A maintenance project will address this issue. No projected needed at this time.

Orchard Recycled Water Turnout
The discharge pipe of the Orchard Recycled Water Turnout does not penetrate completely through the sidewall of the San Antonio Channel and has begun leaking between the soil and sidewall of the channel causing possible erosion. The penetration should be appropriately sealed to prevent the leak behind the sidewall of the channel. In addition, the pipe discharges at the top of the sidewall of the San Antonio Channel allowing for water to cascade to the bottom of the channel creating a load noise issue. The discharge into the channel should be redesign to eliminate the noise issue. A potential project is needed to address this issue.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Brooks Basin	2004	
Orchard Recycled Water Turnout	2007	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – GWR
College Heights Basin
1. Asset Profile

PROCESS FLOW SCHEMATIC
College Heights Basin

College Heights Basin
College Heights Basin is owned by the Chino Basin Water Conservation District (CBWCD) and is located the City of Upland, near the intersection of Monte Vista Avenue and Arrow Route. College Height Basin is comprised of two cells: the West Cell and the East Cell.

- *College Heights Basin West Cell* – College Heights Basin West Cell receives stormwater and imported water from the San Antonio Channel. The West Cell has an approximate size of 6.0 acres and an approximate sidewall depth of 21 feet from a floor elevation of 1223’ to the San Antonio Rubber Dam inflated elevation 1244’ equating to 93.8 AF of storage. The College Heights Basin West Cell includes a 48” automated sluice gate for inlet flow from the San Antonio Channel, staff gauges, and a level transmitter.
- *College Heights Basin East Cell* – College Heights Basin East Cell receives stormwater and imported water from the San Antonio Channel. The East Cell has an approximate size of 7.0 acres and an approximate sidewall depth of 21 feet from a floor elevation of 1223’ to the San Antonio Rubber Dam inflated elevation 1244’ equating to 89.8 AF of storage. The College Heights Basin East Cell includes a 48” automated sluice gate for inlet flow from the San Antonio Channel staff gauges, and a level transmitter.

San Antonio Channel Rubber Dam
A 4’ tall rubber dam has been installed into the San Antonio Channel to divert stormwater and imported water into the College Heights and Upland Basins. The San Antonio Channel Rubber Dam includes a control house with a stilling well, 2.5 hp/154scfm air blower, and a 2” motor controlled vent valve.

Electrical System
The College Heights Basin, Upland Basin, and the San Antonio Channel Rubber Dam share a common electrical system housed in the San Antonio Channel Rubber Dam control house. The electrical energy to power College Heights Basin, Upland Basin, and the San Antonio Channel Rubber Dam is obtained from the local electrical grid (SCE) through a meter on Arrow Route. The system utilizes 120v power, does not have any transformers, and does not have emergency power generation.

Instrumentation and Control System
The College Heights Basin, Upland Basin, and the San Antonio Channel Rubber Dam share a common instrumentation and control system housed in the San Antonio Channel Rubber Dam control house. Local control wiring for gate positions, basin levels, flows, rubber dam pressures, stilling well levels, and vent valve position are fed back to a local PLC. The PLC has a radio antenna that transmits control data to the Almond Repeater and then to RP-1 to the GWR workstation server for control and remote access.

2. Capacity Profile
Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
College Heights Basin West Cell	*Basin* Area: 6.0 acres Depth: 21 ft Volume: 93.8 AF *Gates* 48” sluice gate	Automated
College Heights Basin East Cell	*Basin* Area: 7.0 acres Depth: 21 ft Volume: 89.8 AF *Gates* 48” sluice gate	Automated
San Antonio Channel Rubber Dam	*Rubber Dam* 4 ft tall rubber dam *Blower* 2.5 hp 154 scfm *Vent Valve* 2” ball valve	
Electrical Instrumentation	Utility Voltage: 120 v Transformers: N/A HMI: 1 unit RTU: N/A PLC: 1 unit I/O Hub: 2 units Radio: 1 unit	

3. Asset Ratings
Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
College Heights Basin West Cell				
Basin	3	NA	3	NA
Gates	3	NA	3	NA
College Heights Basin East Cell				
Basin	3	NA	3	NA
Gates	3	NA	3	NA
San Antonio Channel Rubber Dam				
Rubber Dam	3	NA	3	NA
Blower	3	NA	3	NA
Vent Valve	3	NA	3	NA
Electrical & Instrumentation	4	NA	4	NA

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation
San Antonio Channel Rubber Dam
The rubber dams were inspected in January 2015 and were determined to have a remaining lifespan of 5 years remaining. A potential project is needed within the next 5 years to replace the rubber dams.

Instrumentation
The level transmitters for College Heights Basin West Cell and East Cell do not extend to the bottom of the basin floor; and therefore, do not provide an accurate measurement of the level. The wiring and conduit should be extended to allow for relocation of the pressure transmitter to the bottom of the basin floor.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
College Heights Basin West Cell	2004	
College Heights Basin East Cell	2004	
San Antonio Channel Rubber Dam	2004	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – GWR

Declez Basin

1. Asset Profile

PROCESS FLOW SCHEMATIC
Declez Basin

Declez Basin
Declez Basin is owned by the San Bernardino County Flood Control District (SBCFCD) and is located in an unincorporated area of Riverside County, near the intersection of Philadelphia Avenue and Mulberry Avenue Declez Basin is comprised of three cells: Cell 1, Cell 2, and Cell 3

- *Declez Basin Cell 1* – Declez Basin Cell 1 receives stormwater from the Declez Channel and stormwater from a local storm drain system. Cell 1 has an approximate size of 6.7 acres and an approximate sidewall depth of 7 feet from a floor elevation of 825' to the Declez Basin Cell 1 overflow structure at an elevation 832' equating to 42.7 AF of storage. Declez Basin Cell 1 includes a 36" automated sluice gate to discharge flow to Declez Basin Cell 2, staff gauges, and a level transmitter.
- *Declez Basin Cell 2* – Declez Basin Cell 2 receives flow from Declez Basin Cell 1. Cell 2 has an approximate size of 4.6 acres and an approximate sidewall depth of 7 feet from a floor elevation of 823' to the Declez Basin Cell 3 overflow structure at an elevation 830' equating to 29.1 AF of storage. Declez Basin Cell 2 includes a dual 36" automated sluice gate system (one motor actuator, two gates, and two pipelines) to discharge flow to Declez Basin Cell 3, staff gauges, and a level transmitter.
- *Declez Basin Cell 3* – Declez Basin Cell 3 receives flow from Declez Basin Cell 2. Cell 3 has an approximate size of 4.2 acres and an approximate sidewall depth of 8 feet from a floor elevation of 821' to the Declez 3 soil-cement overflow structure at an elevation 829' equating to 30.0 AF of storage. Declez Basin Cell 3 includes a dual 36" automated sluice gate system (one motor actuator, two gates, and two pipelines) to discharge flow to Declez Channel, staff gauges, and a level transmitter.

Electrical System
The electrical energy to power Declez Basin is obtained from the local electrical grid (SCE) through a meter on Philadelphia Avenue The system utilizes 120v power, does not have any transformers, and does not have emergency power generation.

Instrumentation and Control System
Local control wiring for valve position and basin levels are fed back to a local PLC. The basin PLC has a radio antenna that transmits control data to RP-1 to the GWR workstation server for control and remote access.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Declez Basin Cell 1	*Basin* Area: 6.7 acres Depth: 7 ft Volume: 42.7 AF *Gates* 36" sluice gate	Automated
Declez Basin Cell 2	*Basin* Area: 4.6 acres Depth: 7 ft Volume: 29.1 AF *Gates* 2 - 36" sluice gates	Automated
Declez Basin Cell 3	*Basin* Area: 4.2 acres Depth: 8 ft Volume: 30.0 AF *Gates* 2 - 36" sluice gates	Automated
Electrical Instrumentation	Utility Voltage: 240 v Transformers: 1 HMI: 1 unit RTU: N/A PLC: 1 unit I/O Hub: 1 unit Radio: 1 unit	240v/120v

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Declez Basin Cell 1				
Basin	3	NA	3	NA
Gates	3	NA	3	NA
Declez Basin Cell 2				
Basin	3	NA	3	NA
Gates	3	NA	4	NA
Declez Basin Cell 3				
Basin	3	NA	3	NA
Gates	3	NA	4	NA
Electrical & Instrumentation	3	NA	3	NA

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

Declez Basin Cell 2 & 3 Gates
The Declez Basin Cell 2 & 3 discharge gates have control feedback and electrical issues that result in them not functioning. The gates only have power when the PLC calls the gate to operate. When there is no power, feedback is not sent back to SCADA. Entering a SCADA enhancement request to address this issue.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Declez Basin Cell 1	2004	
Declez Basin Cell 2	2004	
Declez Basin Cell 3	2004	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – GWR
Ely Basin
1. Asset Profile

PROCESS FLOW SCHEMATIC
Ely Basin

Ely Basin
Ely Basin is comprised of three basins: Basin 1, Basin 2, and Basin 3. Ely Basin 1 and Ely Basin 2 are owned by the San Bernardino County Flood Control District (SBCFCD) and Ely Basin 3 is owned by the Chino Basin Water Conservation District (CBWCD). Ely Basin is located in City of Ontario, near the intersection of Philadelphia Avenue and Vineyard Avenue

- *Ely Basin 1* – Ely Basin 1 receives stormwater from the West Cucamonga Creek and recycled water from the Ely Basin 1 Recycled Water Turnout. Ely Basin 1 has an approximate size of 9.9 acres and an approximate sidewall depth of 12 feet from a floor elevation of 823' to the Ely Basin 2 overflow structure at an elevation 835' equating to 85.2 AF of storage. Ely Basin 1 includes four 24" manual sluice gates to route flows within the basin, staff gauges, and a level transmitter. A soil cement berm created a forebay on the west side of Ely 1 for collecting debris.
- *Ely Basin 2* – Ely Basin 2 receives flows from Ely Basin 1, stormwater from a local storm drain system, and recycled water from the Ely Basin 2 Recycled Water Turnout. Ely Basin 2 has an approximate size of 11.1 acres and an approximate sidewall depth of 10 feet from a floor elevation of 825' to the Ely Basin 3 overflow structure at an elevation 835' equating to 95.6 AF of storage. Ely Basin 2 includes two 24" manual sluice gates to route flows within the basin, staff gauges, and a level transmitter.
- *Ely Basin 3* – Ely Basin 3 receives flows from Ely Basin 2, stormwater from a local storm drain system, and recycled water from the Ely Basin 3 Recycled Water Turnout. Ely Basin 3 has an approximate size of 11.1 acres and an approximate sidewall depth of 15 feet from a floor elevation of 820' to the West Cucamonga Creek overflow structure at an elevation 835' equating to 135.8 AF of storage. Ely Basin 3 includes three 24" manual sluice gates to route flows within the basin, a 24" automated gate to discharge flows to the West Cucamonga Creek, staff gauges, and a level transmitter.

Ely Basin Turnouts
This system is comprised of three separate turnouts each including a 12" Cla-Val flow control valve, flow meter, and pressure transmitter to provided recycled water to Ely Basin Nos. 1, 2, & 3. Each turnout is designed for flow rates ranging from 700 gpm to 3,100 gpm.

Electrical System
- *Basin* – The electrical energy to power Ely Basin is obtained from the local electrical grid (SCE) through a meter on Philadelphia Avenue near Ely Basin 3. The system utilizes 120v power, does not have any transformers, and does not have emergency power generation.
- *Recycled Water Turnout* – The electrical energy to power the three Ely Basin Recycled Water Turnouts is provided by three independent solar panels. The system utilizes 24v DC power, does not have any transformers, and does not have emergency power generation.

Instrumentation and Control System
- *Basin* – Local control wiring for gate position and basin levels are fed back to a local PLC. The basin PLC has a radio antenna that transmits control data to RP-1 to the GWR workstation server for control and remote access.
- *Recycled Water Turnout* – Local control wiring for flow and valve position, and pressure are fed back to an I/O hub. Each of the three Ely Basin recycled water turnouts has a 10dB yagi antenna that transmits control data to a PLC located at Ely Basin 3. The PLC at Ely Basin 3 then transmits control data back to the GWR workstation server located at RP-1 for remote access.

2. Capacity Profile
Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Ely Basin 1	<u>Basin</u> Area: 9.9 acres Depth: 12 ft Volume: 85.2 AF <u>Gates</u> 4 - 24" sluice gate	 Manual
Ely Basin 2	<u>Basin</u> Area: 11.1 acres Depth: 10 ft Volume: 95.6 AF <u>Gates</u> 2 - 24" sluice gate	 Manual
Ely Basin 3	<u>Basin</u> Area: 11.1 acres Depth: 15 ft Volume: 135.8 AF <u>Gates</u> 3 - 24" sluice gate 1 – 24" sluice gate	 Manual Automated
Ely Basin Recycled Water Turnout	<u>*Flow Control Valve*</u> 3 - 12" @ 700–3,100 gpm	
Electrical Instrumentation	Utility Voltage: 120v 24v DC Transformers: N/A HMI: N/A RTU: 1 unit PLC: 1 unit I/O Hub: 4 units Radio: 4 units	

3. Asset Ratings
Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Ely Basin 1				
Basin	4	NA	3	NA
Gates	4	NA	4	NA
Ely Basin 2				
Basin	3	NA	3	NA
Gates	4	NA	3	NA
Ely Basin 3				
Basin	3	NA	3	NA
Gates	4	NA	3	NA
Ely Basin Recycled Water Turnout				
Flow Control Valve	3	NA	3	NA
Electrical & Instrumentation	3	NA	3	NA

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation
Ely Basin 1
The Ely Basin 1 Forebay berm has cracks in the concrete structure, which allows water to leak from the forebay area into Ely Basin 1. The cracks in the berm structure should be sealed to eliminate the water leaks between the fore-bay and the basin. The basin 1 outlet berm needs a hardened pourover to prevent its annual erosion.

Ely Basin 2
The Ely Basin 2 Bypass channel is too shallow and cannot maintain the required flow. Under high flow conditions, water spills over the berm into Ely Basin 2 causing erosion to the berm. Further evaluation is needed before a project is recommended; these are low priority issues. The basin 2 outlet berm needs a hardened pourover to prevent its annual erosion.

Ely Basin Manual Gates
The Ely Basin manual gates are designed to be submerged when the basins are full of water. The Basin 1 and Basin 2 outlet gates (four tota) are constructed of aluminum; and therefore, have begun to degrade. The gates should be replaced for regular submerssion.. Hand wheels are broken off and are non-operational. Typically these gates are not needed, so further evaluation is needed to determine if this system needs to be rehabbed or removed. There would be a benefit of having a control structure to transfer flows between basins, rather than overflowing from basin to basin, which requires an upgrade to the transfer pipes. The manual aluminum control gates in Basin 3 berms and are not needed and can be removed.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Ely Basin 1	2004	
Ely Basin 2	2004	
Ely Basin 3	2004	
Ely Basin Recycled Water Turnout	2005	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
RW Turnouts	Turnout Downsize for optimizing delivery	The RW turnouts are oversized for the capacity of the Ely basin resulting in flow control and metering issues. They should be reduced in capacity.

Asset Management System Summary – GWR

Etiwanda Debris Basin

1. Asset Profile

Etiwanda Debris Basin
The Etiwanda Debris Basin is owned by the San Bernardino County Flood Control District (SBCFCD) and is located in an unincorporated area of San Bernardino County, near the intersection of Wilson Avenue and East Avenue. The Etiwanda Debris Basin receives stormwater from the San Gabriel Mountains, stormwater from a local storm drain system, and imported water from the CB 14 MWD Imported Water Turnout. The Etiwanda Debris Basin has an approximate size of 15.5 acres and an approximate sidewall depth of 6 feet from a floor elevation of 1599' to the conservation berm elevation of 1605' equating to 72.7 AF of storage. The Etiwanda Debris Basin includes a 24" manual sluice gate for discharge to the East Etiwanda Creek.

CB 14 MWD Imported Water Turnout
The CB 14 MWD Imported Water Turnout is located south of the Etiwanda Debris Basin. The turnout includes a 24" Cla-Val flow control valve with an 18" mag-meter to discharge flow to the Etiwanda Debris Basin, another 24" Cla-Val flow control valve to discharge flow to the East Etiwanda Creek, a force main manifold 18" mag-meter, and a pressure transmitter. The turnout is designed for flow rates ranging from 1,000 gpm to 18,000 gpm which can be shared with delivery to Etiwanda Creek and Victoria Basin.

Electrical System
The Etiwanda Debris Basin has no electrical service. The electrical energy to power the CB 14 MWD Imported Water Turnout is obtained from the local electrical grid (SCE) through a meter on East Avenue The system utilizes 120v power, does not have any transformers, and does not have emergency power generation.

Instrumentation and Control System
The Etiwanda Debris Basin has no instrumentation or controls. The CB 14 MWD Imported Water Turnout has local control wiring for valve position and flows that are fed back to a local PLC. The basin PLC has a radio antenna that transmits control data to the Almond Repeater and then to RP-1 to the GWR workstation server for control and remote access

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Etiwanda Debris Basin	*Basin* Area: 15.5 acres Depth: 6 ft Volume: 72.7 AF *Gates* 24" sluice gate	Manual
CB 14 MWD Imported Water Turnout	*Flow Control Valve* 24" @ 500-9,000 gpm	2 valves
Electrical Instrumentation	Utility Voltage: 120 v Transformers: N/A HMI: N/A RTU: 1 unit PLC: 1 unit I/O Hub: N/A Radio: 1 unit	

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Etiwanda Debris Basin				
Basin	3	NA	3	NA
Gates	3	NA	3	NA
CB 14 MWD Imported Water Turnout				
Flow Control Valve	3	NA	3	NA
Electrical & Instrumentation	3	NA	3	NA

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

Etiwanda Debris Basin
The conservation bern pour over needs to be repaired with further hardened surface to prevent lost capacity in the Etiwanda Debris Basin.

CB 14 MWD Imported Water Turnout
CB 14 MWD Imported Water Turnout has a similar design as the CB 20 MWD Imported Water Turnout, which creates high noise when in operation. Residential home construction is occurring around the turnout and it is probable that sound proofing will be required in the future. The facility is in a remote location, so no project needed at this time to address this issue. MWD requires the MWD meter to not be used for operations as it can lead to overflow conditions. Programming should be done such that lost communication with the meter (0 cfs flow feedback) will not change the valve opening for obtain increased flow.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Etiwanda Debris Basin	2007 2009	
CB 14 MWD Imported Water Turnout	2009	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
Conservation Berm Pour Over	Hardening and Repair	Repair pour over structure to prevent washout and erosion and lost water capture.

Asset Management System Summary – GWR
Grove Basin
1. Asset Profile

PROCESS FLOW SCHEMATIC
Grove Basin

Grove Basin
Grove Basin is owned by the San Bernardino County Flood Control District (SBCFCD) and is located in the City of Ontario, near the intersection of Riverside Avenue and Grove Avenue. Grove Basin receives stormwater from a local storm drain system. Grove Basin has an approximate size of 13.8 acres and an approximate sidewall depth of 25 feet from a floor elevation of 743' to a storm drain exit elevation of 768' equating to 305.5 AF of storage. Grove Basin includes a 42" automated sluice gate for discharge to the storm drain, a 66" automated sluice gate operated by SBFCD, staff gauges, and two level transmitters.

Electrical System
The electrical energy to power Grove Basin is obtained from the local electrical grid (SCE) through a meter on Grove Avenue The system utilizes 480v power and has one 480v to 120v transformer. In addition, Grove Basin has an onsite 50kW, 480v generator.

Instrumentation and Control System
Local control wiring for gate position and basin levels are fed back to a local PLC. The basin PLC has a radio antenna that transmits control data to RP-1 to the GWR workstation server for control and remote access.

2. Capacity Profile
Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Grove Basin	_Basin_ Area: 13.8 acres Depth: 25 ft Volume: 305.5 AF _Gates_ 42" sluice gate 66" sluice gate	 Automated SBFCD
Electrical Instrumentation	Utility Voltage: 480v Transformers: 1 unit Generator: 480v HMI: 1 unit RTU: N/A PLC: 1 unit I/O Hub: 1 unit Radio: 1 unit	480v/120v

3. Asset Ratings
Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Grove Basin				
Basin	3	NA	3	NA
Gates	3	NA	3	NA
Electrical and Instrumentation	4	NA	4	NA

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation
Electrical & Instrumentation
Grove Basin is an old station. A generator powers the gates. A potential project is needed to upgrade the station and provide line power to the electrical equipment. The station is operated, in winter only and has an emergency pourover structure so priority is low to address this issue.

South Berm Seepage Concern Limits Stormwater Depth

SBCFCD has a concern for seepage and failure of the south berm. A seepage evaluate and geophycial study could allow increased stormwater capture and alleviate concerns for the south bern.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Grove Basin	2002	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – GWR
Hickory Basin

1. Asset Profile

Hickory Basin

Hickory Basin is owned by the San Bernardino County Flood Control District (SBCFCD) and is located in an unincorporated area of San Bernardino County, immediately northwest of the California Speedway. Hickory Basin is comprised of two cells: the West Cell and the East Cell.

- *Hickory Basin West Cell* – The Hickory Basin West Cell receives stormwater, imported water, and recycled water from the San Sevaine Channel and flows from the Hickory Basin East Cell. The Hickory Basin West Cell has an approximate size of 6.8 acres and an approximate sidewall depth of 14 feet from a floor elevation of 1101' to the San Sevaine Channel drain outlet pipe at an elevation of 1115' equating to 43.3 AF of storage. The Hickory Basin West Cell includes two 36" manual sluice gates for discharge to San Sevaine Channel, a 3,000 gpm pump to move flows either to Hickory Basin East Cell or Banana Basin, staff gauges and a level transmitter.
- *Hickory Basin East Cell* – The Hickory Basin East Cell receives flows from Banana Basin by way of the West Fontana Channel, pumped flows from the Hickory Basin West Cell, and recycled water from the Force Main Manifold (FMM) Recycled Water Turnout. The Hickory Basin East Cell has an approximate size of 4.2 acres and an approximate sidewall depth of 5 feet from a floor elevation of 1110' to the San Sevaine Channel drain outlet pipe at an elevation of 1115' equating to 18.0 AF of storage. The Hickory Basin East Cell includes a 36" automated sluice gate for discharge to the Hickory Basin West Cell, staff gauges, and a level transmitter.

Force Main Manifold (FMM) Recycled Water Turnout

The FMM Recycled Water Turnout is located south of the intersection of Whittram Avenue and Mulberry Ave, approximately 0.5 miles west of Banana Basin. The turnout includes two 12" motor operated butterfly valves, flow meter, and pressure transmitter to provided recycled water to Hickory Basin East Cell and/or Banana Basin. The turnout is designed for flow rates ranging from 200 gpm to 6,000 gpm. The FMM can be used to route water to Banana basin that is pumped from the Hickory Basin Pump Station. Two additional 12-inch diameter motor operated butterfly valves are located at Hickory Basin in a control vault on the north perimeter road.

San Sevaine Channel Recycled Water Turnout

The turnout is located south of Whittram Avenue at the San Sevaine Channel. The turnout includes a 10" Cla-Val flow control valve, flow meter, and pressure transmitter to provided recycled water to San Sevaine Channel. Recycled Water discharged in the channel can then be conveyed to Hickory Basin West Cell for groundwater recharge or to Jurupa Basin for pumping to RP3 Basin. The turnout is designed for flow rates ranging from 200 gpm to 2,200 gpm.

CB 18 MWD Imported Water Turnout

The CB 18 MWD Imported Water Turnout is located along the SCE and MWD right of way near the intersection of West Liberty Street and the San Sevaine Channel in the City of Fontana. The turnout includes a 24" vertical sleeve type, motor operated control valve, an 18" mag-meter, and a pressure transmitter to provide imported water to San Sevaine Channel. The turnout is designed for flow rates ranging from 1,500 gpm to 13,500 gpm.

San Sevaine Channel Rubber Dam

Flow in San Sevaine Channel such as those released from the CB 18 MWD Imported Water Turnout or the San Sevaine Channel Recycled Water Turnout can be diverted to Hickory Basin using an inflatable rubber dam located on San Sevaine Creek 430 feet south of Whittram Avenue . If the rubber dam is not inflated, flow continues south down the San Sevaine Channel towards Jurupa Basin. The San Sevaine Channel Rubber Dam includes a control house with a stilling well, level transmitter, 2.5 hp/154scfm air blower, and a 2" motor controlled vent valve.

Electrical System

- *Basin, San Sevaine Channel Recycled Water Turnout, and Rubber Dam* – Hickory Basin, the San Sevaine Channel Recycled Water Turnout, and the San Sevaine Channel Rubber Dam share a common electrical system housed in the San Sevaine Channel Rubber Dam control house. The electrical energy to power these systems is obtained from the local electrical grid (SCE) through a meter on Whittram Avenue The system utilizes 480v power, has one 480v to 120v transformer, and does not have emergency power generation.
- *FMM Recycled Water Turnout* – The electrical energy to power the FMM Recycled Water Turnout is obtained from the local electrical grid (SCE) through a meter on Whittram Avenue The system utilizes 120v power, does not have any transformers, and does not have emergency power generation.
- *Imported Water Turnout* – The electrical energy to power the CB 18 MWD Imported Water Turnout is obtained from the local electrical grid (SCE) through a meter on East Avenue The system utilizes 120v power, does not have any transformers, and does not have emergency power generation.

Instrumentation and Control System

- *Basin, San Sevaine Channel Recycled Water Turnout, and Rubber Dam* – Hickory Basin, the San Sevaine Channel Recycled Water Turnout, and the San Sevaine Channel Rubber Dam share a common instrumentation system housed in the San Sevaine Channel Rubber Dam control house. Local control wiring for gate positions, basin levels, flows, rubber dam pressures, stilling well levels, and vent valve position are fed back to a local PLC. This PLC has a radio antenna that transmits control data to RP-4 and then to RP-1 to the GWR workstation server for control and remote access.
- *FMM Recycled Water Turnout* – Local control wiring for flow and valve position for the both Hickory and Banana Basins are fed back to the remote telemetry unit. The turnout has a 10dB yagi antenna that transmits control data to RP-4, which routes the information to RP-1 to the GWR workstation server for control and remote access.
- *Imported Water Turnout* – Local control wiring for flow and valve position are fed back to a local PLC. The turnout PLC has a radio antenna that transmits control data to the Almond Repeater and then to RP-1 to the GWR workstation server for control and remote access.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Hickory Basin West Cell Basin Gates Pumps	 Area: 6.8 acres Depth: 14 ft Volume: 43.3 AF 2 - 36" sluice gate 8" @ 1,800 gpm	 Manual
Hickory Basin East Cell Basin Gates	 Area: 4.2 acres Depth: 5 ft Volume: 18.0 AF 36" sluice gate	 Automated
FMM Recycled Water Turnout Flow Control Valve Valves	 12" @ 200–6,000 gpm 12" Flow Meter 10" gate	 2 Valves 2 – Manual
	10" backflow preventer	
San Sevaine Channel Recycled Water Turnout Flow Control Valve	 10" @ 200–2,200 gpm	 w/ FM
CB 18 MWD Imported Water Turnout Flow Control Valve	 24" @ 1,500-13,500gpm	
San Sevaine Channel Rubber Dam Blower Vent Valve	 4 ft tall rubber dam 2.5 hp 54 scfm 2" ball valve	
Electrical Instrumentation	Utility Voltage: 120v & 480 v Transformers: 1 unit MI: 1 unit RTU: 1 unit PLC: 2 unit I/O Hub: 3 units Radio: 3 unit	 480v/120v

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Hickory Basin				
West Cell Basin	3	NA	3	NA
West Cell Gates	4	NA	4	NA
West Cell Pump	3	NA	3	NA
East Cell Basin	3	NA	3	NA
East Cell Gates	3	NA	3	NA
FMM Recycled Water Turnout				
Flow Control Valve	3	NA	3	NA
Valves	5	NA	5	NA
San Sevaine Recycled Water Turnout				
Flow Control Valve	3	NA	3	NA
CB 18 MWD Imported Water Turnout				
Flow Control Valve	3	NA	3	NA
San Sevaine Channel Rubber Dam				
Rubber Dam	3	NA	3	NA
Blower	3	NA	3	NA
Vent Valve	3		3	
Electrical & Instrumentation	3		4	

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

Hickory Basin West Cell Gates

One of the manual gates is missing a lift stem and cannot be operated. The gate is used to drain back to the San Sevaine Channel; this can only be done when the operating level is below the conservation berm. This issue will be addressed as a maintenance item, and potential project is not needed at this time. The manual outlet manual valve operator wheel requires the operator to enter water to turn, A small cinderblock platform was constructed by GWR operations, but should be made permanent such that it does not require water entry to use. A extended lift stem will be required such that the wheel can be turned at an ergonomic height (now its about 1-2 feet above foot level..

San Sevaine Channel Rubber Dam
The rubber dam was inspected in April 2022 and was determined to be in imminent need of replacement. IEUA currently has one replacement dam on hand, but should procure an additional replacement so that the Agency is prepared to replace the Hickory and Turner rubber dams when needed.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Hickory Basin West Cell	2004	
Hickory Basin East Cell	2004	
FMM Recycled Water Turnout	2006	
San Sevaine Recycled Water Turnout	2006	
CB 18 MWD Imported Water Turnout	2005	
San Sevaine Channel Rubber Dam	2004	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
Hickory West Outlet	Outlet control safe operations	Raise Actuator footing and increase lift stem length for safety and ergonomics.

Asset Management System Summary – GWR

Jurupa Basin

1. Asset Profile

PROCESS FLOW SCHEMATIC
Jurupa Basin

Jurupa Basin
Jurupa Basin is owned by the San Bernardino County Flood Control District (SBCFCD) and is located in the City of Fontana, at the intersection of Mulberry Avenue and Jurupa Avenue. Jurupa Basin receives stormwater, imported water, and recycled water from the San Sevaine Channel and stormwater from a local storm drain system. Jurupa Basin is used for flood control purposes; however, it is not used for groundwater recharge. Jurupa Basin has an approximate size of 55.9 acres and an approximate sidewall depth of 42 feet from a floor elevation of 885' to the San Sevaine Channel overflow structure at an elevation of 927' equating to 1,538.7 AF of flood storage. Water for recharge can be stored for pumping behind an approximate 6-foot tall soil conservation berm with a crude hardened pour over. Jurupa Basin includes a 48" automated sluice gate at its inlet from the San Sevaine Channel, a 72" manual sluice gate for the inlet to the Jurupa Pump Station Wet Well, a 36" manual sluice gates in the conservation berm for drainage discharge back to San Sevaine Channel, one 300 hp 9,000 gpm VFD driven pumps to send flow to RP3 Basin, flow meter, pressure transmitters, backflow preventer, sump pump, staff gauges and one level transmitter. Pump station Building houses the PLC, VFD, exhaust fans and other appurtenances.

Electrical System
The electrical energy to power these systems is obtained from the local electrical grid (SCE) through a meter on Jurupa Avenue The system utilizes 480v power, has one 480v to 120v transformer, and does not have emergency power generation.

Instrumentation and Control System
Local control wiring for gate positions, basin levels, and flows are fed back to a local PLC. This PLC has a radio antenna that transmits control data to the Almond repeater and then to RP-1 to the GWR workstation server for control and remote access.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Jurupa Basin	*Basin* Area: 55.9 acres Depth: 42 ft Volume: 1,538.7 AF *Gates* 48" sluice gate 72" sluice gate 2 - 36" sluice gate *Pumps* 2- 300 hp & 3,000 gpm Sump Pump	 Automated Manual Manual VFD
Electrical Instrumentation	Utility Voltage: 480 v Transformers: 1 unit HMI: 1 unit RTU: N/A PLC: 1 unit I/O Hub: 1 unit Radio: 1 unit	 480v/120v

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Jurupa Basin				
Basin	3	NA	4	NA
Gates	3	NA	4	NA
Pumps	3	NA	4	NA
Electrical & Instrumentation	3	NA	3	NA

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

Jurupa Basin
The Jurupa Basin berm is not a permanent structure and overflows during large storm events. This has led to the erosion of the berm. The berm should be improved, an overflow structure constructed, and a flow through gate provided. A project is needed to convert the basin from a stormwater only to a multipurpose basin that can recharge recycled water and stormwater. Recycled water can be provided from the turnout on Whittram Avenue. Such a project will require a change to the recharge permit.

Jurupa Basin Gates
The Jurupa Basin inlet structure from San Sevaine Channel does not have capacity to receive large storm flows or imported water flows. The capacity of the structure should be increased to allow more flow into the basin. This is being addressed under an existing project Wineville/Jurupa/Force Main Improvements projects.

Jurupa Basin Pumps
Storm debris can be pushed toward the inlet of the Jurupa Pump Station and clog the inlet of the pumps. An inlet screening structure should be installed to maintain function of the pump station. Project underway to install trash boom system.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Jurupa Basin	2004 2009 2022	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – GWR
Lower Day Basin
1. Asset Profile

Lower Day Basin
Lower Day

Basin is owned by the San Bernardino County Flood Control District (SBCFCD) and is located in the City of Rancho Cucamonga, at the intersection of Rochester Avenue and Highland Avenue Lower Day Basin is comprised of three cells: Cell 1, Cell2, and Cell 3.

- *Lower Day Basin North Cell* ---
- *Lower Day Basin Cell 1* - Lower Day Basin Cell 1 receives stormwater and imported water from Day Creek and stormwater from a local storm drain system. Lower Day Basin Cell 1 has an approximate size of 3.7 acres and an approximate sidewall depth of 8 feet from a floor elevation of 1370' to the Lower Day Basin Cell 2 overflow structure at an elevation of 1378' equating to 26.2 AF of storage. Lower Day Basin Cell 1 includes a 36" automated sluice gate on the inlet to Lower Day Basin Cell 1 from Day Creek, a 36" manual sluice gate for discharge to Lower Day Basin Cell 2, and a level transmitter.
- *Lower Day Basin Cell 2* – Lower Day Basin Cell 2 receives stormwater and imported water from Day Creek and flows from Lower Day Basin Cell 1. Cell 2 has an approximate size of 5.1 acres and an approximate sidewall depth of 8 feet from a floor elevation of 1365' to the Lower Day Basin Cell 3 overflow structure at an elevation of 1373' equating to 31.4 AF of storage. Lower Day Basin Cell 2 includes a 36" manual sluice gate for ouflow discharge to l 3, staff gauges, and a level transmitter.
- *Lower Day Basin Cell 3* – Lower Day Basin Cell 3 receives flows from Cell 2. Lower Day Basin Cell 3 has an approximate size of 6.3 acres and an approximate sidewall depth of 10 feet from a floor elevation of 1363' to the Day Creek overflow structure at an elevation of 1373' equating to 55.4 AF of storage. Lower Day Basin Cell 3 includes a 72" automated sluice gate for outlow discharge to Day Creek, staff gauges, and a level transmitter.

CB 15 MWD Imported Water Turnout
The CB 15 MWD Imported Water Turnout is located near the intersection of Banyan Street and Day Creek in the City of Rancho Cucamonga. The turnout includes a 20" horizontal sleeve type, motor operated control valve, a 20" mag-meter, and a pressure transmitter to provided imported water to Day Creek. The turnout is designed for flow rates ranging from 1,500 gpm to 13,500 gpm.

Day Creek Rubber Dam
Flow released from the CB 15 MWD Imported Water Turnout can be diverted to Lower Day Basin using an inflatable rubber dam located on Day Creek below Highland Avenue. The Day Creek Rubber Dam includes a control house with a stilling well, 2.5 hp/154scfm air blower, and a 2" motor controlled vent valve.

Electrical System
- *Basin and Rubber Dam* – Lower Day Basin and the Day Creek Rubber Dam share a common electrical system housed in the Day Creek Rubber Dam control house. The electrical energy to power these systems is obtained from the local electrical grid (SCE) through a meter on Whittram Avenue The system utilizes 120v power, does not have any transformers, and does not have emergency power generation.
- *Imported Water Turnout* – The electrical energy to power the CB 15 MWD Imported Water Turnout is obtained from the local electrical grid (SCE) through a meter on East Avenue The system utilizes 120v power, does not have any transformers, and does not have emergency power generation.

Instrumentation and Control System
- *Basin and Rubber Dam* – – Lower Day Basin and the Day Creek Rubber Dam share a common instrumentation system housed in the Day Creek Rubber Dam control house. Local control wiring for gate positions, basin levels, flows, rubber dam pressures, stilling well levels, and vent valve position are fed back to a local PLC. This PLC has a radio antenna that transmits control data to the Almond Repeater and then to RP-1 to the GWR workstation server for control and remote access.
- *Imported Water Turnout* – Local control wiring for flow and valve position are fed back to a local PLC. The turnout PLC has a radio antenna that transmits control data to the Almond Repeater and then to RP-1 to the GWR workstation server for control and remote access.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Lower Day Basin Cell 1	<u>Basin</u> Area: 3.7 acres Depth: 8 ft Volume: 26.2 AF <u>Gates</u> 36" sluice gate 36" sluice gate	 Automated Manual
Lower Day Basin Cell 2	<u>Basin</u> Area: 5.1 acres Depth: 8 ft Volume: 31.4 AF <u>Gates</u> 36" sluice gate	 Manual
Lower Day Basin Cell 3	<u>Basin</u> Area: 6.3 acres Depth: 10 ft Volume: 55.4 AF <u>Gates</u> 72" sluice gate	 Automated
CB 15 MWD Imported Water Turnout	*<u>Flow Control Valve</u>* 20" @ 1,500-13,500 20" mag-meter	gpm
Day Creek Rubber Dam	*<u>Rubber Dam</u>* 4 ft tall rubber dam *<u>Blower</u>* 2.5 hp 154 scfm *<u>Vent Valve</u>* 2" ball valve	
Electrical Instrumentation	Utility Voltage: 120 v Transformers: N/A HMI: 1 unit RTU: 1 unit PLC: 2 unit I/O Hub: 2 units Radio: 2 unit	

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Lower Day Basin Cell 1				
Basin	3	NA	3	NA
Gates	3	NA	4	NA
Lower Day Basin Cell 2				
Basin	3	NA	3	NA
Gates	3	NA	3	NA
Lower Day Basin Cell 3				
Basin	3	NA	3	NA
Gates	4	NA	4	NA
CB 15 MWD Imported Water Turnout				
Flow Control Valve	3	NA	3	NA
Day Creek Rubber Dam				
Rubber Dam	3	NA	3	NA
Blower	3	NA	3	NA
Vent Valve	3	NA	3	NA
Electrical and Instrumentation	4	NA	4	NA

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

Lower Day Basin Gate
The Lower Day Basin inlet gate from Day Creek cannot open to 100 % due to an incorrectly positioned stem coupling. The stem coupling cannot move through the opening in the gate structure vault; and therefore, the gate can only be opened to a maximum of 75%. The stem should be replaced to allow for full motion of the gate. The gate should be repaired under the reoccurring GWR Asset Management project. Further investigation is needed prior to recommending a project to address this issue.

Day Creek Rubber Dam
The rubber dams were inspected in January 2015 and were determined to have a remaining lifespan of 5 years remaining. A potential project is needed within the next 5 years to replace the rubber dams.

Electrical & Instrumentation
Wires stolen from Lower Basin Cell 3. The gate is not operational, lost control and level transmitter feedback. A potential project is needed to address this issue.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Lower Day Basin Cell 1	2004	
Lower Day Basin Cell 2	2004	
Lower Day Basin Cell 3	2004	
CB 15 MWD Imported Water Turnout	2004	
Day Creek Rubber Dam	2004	
Electrical and Instrumentation	2004	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – GWR

Montclair Basin

1. Asset Profile

Montclair Basins

Montclair Basins are owned by the Chino Basin Water Conservation District (CBWCD) and are located in City of Montclair along San Antonio Creek,. Montclair Basins consist of four basins: Basin 1, Basin 2, Basin 3, and Basin 4.

- *Montclair Basin 1* – Montclair Basin 1 is located at the intersection of Arrow Hwy. and the San Antonio Channel. Montclair Basin 1 receives stormwater and imported water from the San Antonio Channel and stormwater from a local storm drain system. Montclair Basin 1 has an approximate size of 8.3 acres and an approximate sidewall depth of 30 feet from a floor elevation of 1099' to the Montclair Basin 2 overflow structure at an elevation 1129' equating to 150.0 AF of storage. Montclair Basin 1 includes a 36" locally-controlled motor-operate sluice gate for diversion of water from San Antonio Channel followed by locally read Parshall flume flow monitoring station. The basin has a midlevel outlet is controlled with a 24" manual sluice gate to discharge flows to Montclair Basin 2, staff gauges, and a level transmitter.
- *Montclair Basin 2* – Montclair Basin 2 is located at the intersection of Moreno Street and the San Antonio Channel. Montclair Basin 2 receives flow from Montclair Basin 1 and stormwater from a local storm drains. Montclair Basin 2 has an approximate size of 12.6 acres and an approximate sidewall depth of 36 feet from a floor elevation of 1065' to the San Antonio Channel overflow structure at an elevation 1101' equating to 295.4 AF of storage. outflow from Montclair Basin 2 to to Montclair Basin 3 is through abandoned 24-inch diameter pipes at a depth of approximately 30 feet. The basin has staff gauges, and a level transmitter.
- *Montclair Basin 3* – Montclair Basin 3 is located at the intersection of San Jose Street and the San Antonio Channel. Montclair Basin 3 receives flow from Montclair Basin 2 and local storm drains. Montclair Basin 3 has an approximate size of 4.6 acres and an approximate sidewall depth of 23 feet from a floor elevation of 1034' to the Montclair Basin 4 overflow structure at an elevation 1057' equating to 63.8 AF of storage. Montclair Basin 3 has staff gauges and a level transmitter.
- *Montclair Basin 4* – Montclair Basin 4 is located at the intersection of the 10 Freeway and the San Antonio Channel. Montclair Basin 4 receives flow from Montclair Basin 3 and stormwater from a local storm drain system. Montclair Basin 4 has an approximate size of 6.2 acres and an approximate sidewall depth of 27 feet from a floor elevation of 1010' to the San Antonio Channel overflow structure at an elevation 1037' equating to 111.0 AF of storage. Montclair Basin 4 has staff gauges and.

Electrical System

The electrical energy to power Montclair Basins is obtained from the local electrical grid (SCE) through a meter on San Jose Street near Montclair Basin 2. The system utilizes 120v power, does not have any transformers, and does not have emergency power generation.

Instrumentation and Control System

Local control wiring for gate position, flows, and basin levels are fed back to a local PLC. The basin PLC has a radio antenna that transmits control data to the Almond Repeater and then to RP-1 to the GWR workstation server for control and remote access.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Montclair Basin 1	<u>Basin</u> Area: 8.3 acres Depth: 30 ft Volume: 150.0 AF <u>Gates</u> 36" sluice gate 24" sluice gate	 Motorized Manual
Montclair Basin 2	<u>Basin</u> Area: 12.6 acres Depth: 36 ft Volume: 295.4 AF <u>Gates</u> 2 - 24" sluice gate	 Abandoned
Montclair Basin 3	<u>Basin</u> Area: 4.6 acres Depth: 23 ft Volume: 63.8 AF	
Montclair Basin 4	<u>Basin</u> Area: 6.2 acres Depth: 27 ft Volume: 111.0 AF	
Electrical Instrumentation	Utility Voltage: 120v Transformers: N/A HMI: N/A RTU: N/A PLC: 1 unit I/O Hub: 1 unit Radio: 1 unit	

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Montclair Basin 1				
Basin	3	NA	3	NA
Gates	5	NA	5	NA
Montclair Basin 2				
Basin	3	NA	3	NA
Gates	5	NA	5	NA
Montclair Basin 3				
Basin	3	NA	3	NA
Montclair Basin 4				
Basin	3	NA	3	NA
Electrical and Instrumentation	3	NA	3	NA

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

Montclair Basin 1

The Montclair Basin 1 motor operated gate is over 30 years old and is not connected to SCADA. The gate should be replaced and connected to SCADA. Replacement of the gate is the responsibility of Chino Basin Conversation District.

Montclair Basin 2

The Montclair Basin 2 discharge gates abandoned in the open position. Conduits have been run through the open gates.and piping. .

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Montclair Basin 1	2004	
Montclair Basin 2	2004	
Montclair Basin 3	2004	
Montclair Basin 4	2004	
Electrical and Instrumentation	2004	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – GWR
RP-3 Basin
1. Asset Profile

PROCESS FLOW SCHEMATIC
RP-3 Basin

RP-3 Basin
RP3 Basin is owned by Inland Empire Utilities Agency (IEUA) and is located in the City of Fontana, north of Declez Creek near the intersection of Jurupa Avenue and Beech Avenue RP3 Basin is comprised of four cells: Cell1, Cell2, Cell 3, and Cell 4.

- *RP3 Basin Cell 1* – RP3 Basin Cell 1 receives pumped flows from the Jurupa Basin. RP3 Basin Cell 1 has an approximate size of 9.0 acres and an approximate sidewall depth of 12 feet from a floor elevation of 947' to the Declez Channel Rubber Dam at an inflated elevation of 952' equating to 117 AF of storage. RP3 Basin Cell 1 includes a 36" automated sluice gate, two 30" automated sluice gates, staff gauges, and two level transmitters.
- *RP3 Basin Cell 2 M* –Cell 2M serves largely as a mitigation habitat but does provide recharge. Cell 2M receives stormwater from the Declez Channel and flows from RP3 Basin 1. RP3 Basin Cell 2 has an approximate size of 8.4 acres and an approximate sidewall depth of 8 feet from a floor elevation of 944' to the Declez Channel Rubber Dam at an inflated elevation of 952' equating to 44.3 AF of storage. RP3 Basin Cell 2 includes a 30" automated sluice gate, a 24" manual sluice gate to the after bay, and a level transmitter.
- *RP3 Basin Cell R -*
- *RP3 Basin Cell 3* – RP3 Basin Cell 3 receives stormwater from the Declez Channel and flows from RP3 Basin 1. RP3 Basin Cell 3 has an approximate size of 7.6 acres and an approximate sidewall depth of 12 feet from a floor elevation of 940' to the Declez Channel Rubber Dam at an inflated elevation of 952' equating to 76.4 AF of storage. RP3 Basin Cell 3 includes two 30" automated sluice gates, staff gauges, and two level transmitters.
- *RP3 Basin Cell 4* – RP3 Basin Cell 4 receives stormwater from the Declez Channel and flows from RP3 Basin 1. RP3 Basin Cell 4 has an approximate size of 8.9 acres and an approximate sidewall depth of 14 feet from a floor elevation of 938' to the Declez Channel Rubber Dam at an inflated elevation of 952' equating to 91.7 AF of storage. RP3 Basin Cell 4 includes two 30" automated sluice gates, staff gauges, and two level transmitters.

Declez Channel Rubber Dam
A 4' tall rubber dam has been installed into Declez Channel divert water from Declez Creek to the RP3 Basin. The Declez Channel Rubber Dam includes a control house with a stilling well, 2.5 hp/154scfm air blower, and a 2" motor controlled vent valve. The Declez Channel Rubber Dam diverts flow into the RP3 Distribution Channel, which routes water to the RP3 Basins. The RP3 Distribution Channel includes three 30" automated inlet sluice gates, an 18" automated sluice gate, and a manual outlet. Other sluice gates occur on the channel for each of the RP3 Cells and are discussed for those cells.

Electrical System
The electrical energy to power these systems is obtained from the local electrical grid (SCE) through a meter on Beech Avenue The system utilizes 120v power, does not have any transformers, and does not have emergency power generation.

Instrumentation and Control System
Local control wiring for gate positions, basin levels, flows, rubber dam pressures, stilling well levels, and vent valve position are fed back to a local PLC. This PLC has a radio antenna that transmits control data to the Almond Repeater and then to RP-1 to the GWR workstation server for control and remote access.

2. Capacity Profile
Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
RP-3 Basin Cell 1	Basin Area: 9.0 acres Depth: 5 ft Volume: 37.7 AF Gates 36" sluice gate 2 - 30" sluice gate	 Automated Automated
RP-3 Basin Cell 2	Basin Area: 8.4 acres Depth: 8 ft Volume: 44.3 AF Gates 30" sluice gate 24" sluice gate	 Motorized Manual
RP-3 Basin Cell 3	Basin Area: 7.6 acres Depth: 12 ft Volume: 76.4 AF Gates 2 - 30" sluice gates	 Motorized
RP-3 Basin Cell 4	Basin Area: 8.9 acres Depth: 14 ft Volume: 91.7 AF Gates 2 - 30" sluice gates	 Motorized
Declez Channel Rubber Dam	Rubber Dam 4 ft tall rubber dam Blower 2.5 hp 154 scfm Vent Valve 2" ball valve RP-3 Channel Gates 3 – 30" sluice gates 24" sluice gate 18" sluice gate 2-flume flow meters	 Automated Motorized Manual Abandoned
Electrical Instrumentation	Utility Voltage: 120v Transformers: N/A HMI: 1 unit RTU: N/A PLC: 1 unit I/O Hub: 1 unit Radio: 1 unit	

3. Asset Ratings
Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
RP-3 Basin Cell 1				
Basin	3	NA	3	NA
Gates	3	NA	4	NA
RP-3 Basin Cell 2				
Basin	3	NA	3	NA
Gates	3	NA	4	NA
RP-3 Basin Cell 3				
Basin	3	NA	3	NA
Gates	3	NA	4	NA
RP-3 Basin Cell 4				
Basin	3	NA	3	NA
Gates	3	NA	4	NA
Declez Channel Rubber Dam				
Rubber Dam	3	NA	3	NA
Blower	3	NA	3	NA
Vent Valve	3	NA	3	NA
RP-3 Channel Gates	3	NA	3	NA
Electrical and Instrumentation	3	NA	4	NA

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation
Declez Channel Rubber Dam
The rubber dams were inspected in January 2015 and were determined to have a remaining lifespan of 5 years remaining. A potential project is needed within the next 5 years to replace the rubber dams.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
RP-3 Basin Cell 1	2004	
RP-3 Basin Cell 2	2004	
RP-3 Basin Cell 3	2004	
RP-3 Basin Cell 4	2004	
Declez Channel Rubber Dam	2004	
Electrical and Instrumentation	2004	

* Appendix B – Condition Assessment Reports

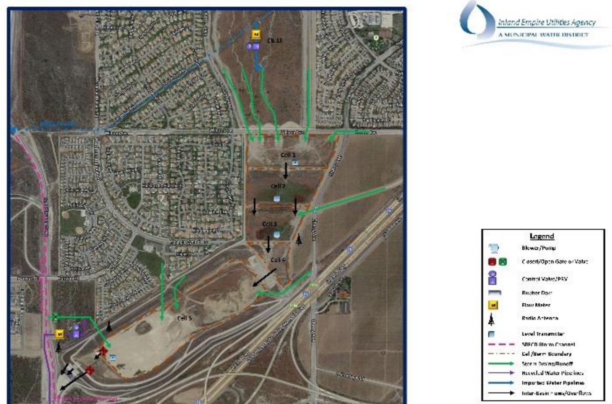
Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – GWR

San Sevaine Basin (MZ-2)

1. Asset Profile



PROCESS FLOW SCHEMATIC
San Sevaine Basin

San Sevaine Basin

San Sevaine Basin is owned by the San Bernardino County Flood Control San Sevaine Basin is owned by the San Bernardino County Flood Control District (SBCFCD) and is located in the City of Rancho Cucamonga, near the intersection of Wilson Avenue and Cherry Avenue San Sevaine Basin is comprised of five basins: Basin 1, Basin 2, Basin 3, Basin 4, and Basin 5.

- *San Sevaine Basin 1* – San Sevaine Basin 1 receives stormwater and imported water from the San Sevaine flood plain and stormwater from a local storm drain system. San Sevaine Basin 1 also receives recycled water from a 30" pipe, which discharges on the basin floor near the basin's southwestern corner. San Sevaine Basin 1 has an approximate size of 15.9 acres and an approximate sidewall depth of 9 feet from a floor elevation of 1484' to the San Sevaine Basin 2 overflow structure at an elevation of 1493' equating to 76.7 AF of storage. San Sevaine Basin 1 has a level transmitter.
- *San Sevaine Basin 2* – San Sevaine Basin 2 receives flow from San Sevaine Basin 1. San Sevaine Basin 2 also receives recycled water from a 30" pipe, which discharges on the basin floor near the basin's southwestern corner. San Sevaine Basin 2 has an approximate size of 11.8 acres and an approximate sidewall depth of 9 feet from a floor elevation of 1467' to the San Sevaine Basin 3 overflow structure at an elevation of 1476' equating to 58.5 AF of storage. San Sevaine Basin 2 has a level transmitter.
- *San Sevaine Basin 3* – San Sevaine Basin 3 receives flow from San Sevaine Basin 2 and stormwater from a local storm drain system. San Sevaine Basin 3 also receives recycled water from a 30" pipe, which discharges on the basin floor near the basin's southwestern corner. San Sevaine Basin 3 has an approximate size of 9.9 acres and an approximate sidewall depth of 8 feet from a floor elevation of 1453' to the San Sevaine Basin 4 overflow structure at an elevation of 1461' equating to 34.5 AF of storage. San Sevaine Basin 3 has a level transmitter.
- *San Sevaine Basin 4* – San Sevaine Basin 4 receives flow from San Sevaine Basin 3, has very little storage and passes flows on to San Sevaine 5. At capacity, Basin 4 holds 6.4 AF over 3.6 acres.
- *San Sevaine Basin 5* – San Sevaine Basin 5 receives storm water and imported water (from CB 14 discussed earlier for Etiwanda Basin) from the East Etiwanda Creek, flows from San Sevaine Basin 4, and stormwater from a local storm drain system. San Sevaine Basin 5 has an approximate size of 73.5 acres and an approximate sidewall depth of 17 feet from a floor elevation of 1382' to the San Sevaine Channel overflow structure at an elevation of 1399' equating to 798.7 AF of storage. San Sevaine Basin 5, 48" sluice gate inlet from the East Etiwanda Creek, 96" manual sluice gates for discharge to the San Sevaine Channel, a 42" manual sluice gate, and a basin level transmitter.

San Sevaine Basin 5 Pump Station

The pump station includes two 10 cfs submersible pumps installed in a 24' wet well, wet well level transmitter, two 12" flanged gate valves, two 12" anti slam check valves, sump pump installed in the valve vault

San Sevaine Basin Recycled Water Turnout

The turnout includes a 20" Cla-Val flow control valve, 20" electromagnetic flowmeter, pressure transmitter, and three 20" flanged gate valves to provide recycled water to the groundwater recharge basin. The turnout is designed for flow rates ranging from 400 gpm to 6,700 gpm.

CB 13 MWD Imported Water Turnout

The CB 13 MWD Imported Water Turnout is located north of San Sevaine Basin in the San Sevaine flood plain. The turnout is owned by Metropolitan Water District of Southern California. CB 13 includes a 24" vertical sleeve type, motor operated control valve, a 24" mag-meter, and a pressure transmitter to provided imported water to San Sevaine Channel. The turnout is designed for flow rates ranging from 500 gpm to 9,000 gpm. Deliveries from the turnout recharge enroute in the creek and in basin 1 and 2. Flows from CB13 do not generally reach San Sevaine 3.

Electrical System

- *Basins* – The electrical energy to power the basin is provided by independent solar panels. The system utilizes 24v DC power, does not have any transformers, and does not have emergency power generation.
- *San Sevaine 5 Pump Station –*
- *Recycled Water Turnout* – The electrical energy to power the San Sevaine Basin Recycled Water Turnout is obtained from the local electrical grid (SCE) through a meter on Cherry Avenue The system utilizes 120v power, does not have any transformers, and does not have emergency power generation.
- *Imported Water Turnout* – The turnout is not operated by IEUA.

Instrumentation and Control System

- *Basins* – Local control wiring for basin levels are fed back to a local PLC. This PLC has a radio antenna that transmits control data to RP-4 and then to RP-1 to the GWR workstation server for control and remote access.
- *San Sevaine 5 Pump Station –*
- *Recycled Water Turnout* – Local control wiring for flow and valve position are fed back to a remote I/O hub, which radios control data to the San Sevaine Basin 3 RTU. The San Sevaine Basin 3 RTU has a radio that transmits control data to RP-4, which routes the information to RP-1 to the GWR workstation server for control and remote access. In addition, there is a San Sevaine Basin Turnout Main RTU that radios information back to RP-4.
- *Imported Water Turnout –*

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
System Sub System(s)	**Design Capacity (Dry Weather Average)**	**Notes**
San Sevaine Basin Cell 1	Area: 15.9 acres Depth: 9 ft Volume: 76.7 AF	
San Sevaine Basin Cell 2	Area: 11.8 acres Depth: 9 ft Volume: 58.5 AF	
San Sevaine Basin Cell 3	Area: 9.9 acres Depth: 8 ft Volume: 34.5 AF	
San Sevaine Basin Cell 5 Gates	Area: 73.5 acres Depth: 17 ft Volume: 798.7 AF 48" sluice gate	Manual
System Subsystem(s)	**Design Capacity (Dry Weather Average)**	**Notes**
	96" sluice gate 42" sluice gate	Manual Manual
San Sevaine Basin Recycled Water Turnout Flow Control Valve	20" Cla-Val @ 400–6,700 gpm 20" Electromagnetic flowmeter	
San Sevaine Basin 5 Pump Station	Two 10 cfs submersible pumps	
Electrical Instrumentation	Utility Voltage: 120v 24v DC Transformers: N/A HMI: 1 unit RTU: 2 unit PLC: 2 unit I/O Hub: 2 unit Radio: 3 unit	

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
San Sevaine Basin Cell 1				
Basin	3	NA	3	NA
San Sevaine Basin Cell 2				
Basin	3	NA	3	NA
San Sevaine Basin Cell 3				
Basin	3	NA	3	NA
San Sevaine Basin Cell 4				
Basin	3	NA	3	NA
San Sevaine Basin Cell 5				
Basin	3	NA	3	NA
Gates	3	NA	3	NA
San Sevaine Basin Recycled Water Turnout				
Flow Control Valve	3	NA	3	NA
Electrical & Instrumentation	3	NA	4	NA

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

Instrumentation

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
San Sevaine Basin Cell 1	1959 1969 2019	
San Sevaine Basin Cell 2	1969	
San Sevaine Basin Cell 3	1969	
San Sevaine Basin Cell 4	1969	
San Sevaine Basin Cell 5	2003 2019	
San Sevaine Basin Recycled Water Turnout	2011 2019	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – GWR
Turner Basin 1 & 2
1. Asset Profile

Turner Basins 1 & 2
Tuner Basins are consist of multiple basins numbered Basins 1 through 8. The north 350' of Turner Basin 1 is owned by the Chino Basin Water Conservation District, while the remaining portions of Turner Basin 1&2 and Turner 3&4 and 8 are owned by the San Bernardino County Flood Control District (SBCFCD). Turner 5, 6, and 7 are owned by the San Bernardino County Parks Department. Turner 1&2 are located in the City of Ontario, south of 4th Street and east of Cucamonga Creek.

- *Turner 1* – Turner Basin 1 receives stormwater from Cucamonga creek, stormwater, imported water, and recycled water via Deer Creek, and recycled water from either the Turner Basin 1 Recycled Water Turnout or the Deer Creek Recycled Water Turnout. Imported water for Turner 1 comes from CB-11 discussed in detail for Turner 3&4. Turner 1 has an approximate size of 13.9 acres and an approximate sidewall depth of 38 feet from a floor elevation of 965' to the Turner 2 overflow structure at an elevation of 1003' equating to 314.0 AF of storage. Turner 1 includes a 48-inch tall by 96inch wide automated sluice gatefor the basin inlet from Cucamonga Creek, a 48" automated sluice gate for the Turner 1 inlet from Deer Creek, a 42" automated sluice gate for discharge to Turner 2. The basin has a staff gauges and a level transmitter.
- *Turner 2* – Turner 2 receives flows from Turner 1. Turner 2 has an approximate size of 4.0 acres and an approximate sidewall depth of 22 feet from a floor elevation of 968' to the Cucamonga Creek overflow structure at an elevation of 990' equating to 51.7 AF of storage. Turner 2 has staff gauges and a level transmitter.

Tuner 1 Recycled Water Turnout
The Turner 1 Recycled Water Turnout is located on the northwest side of Turner 1. The turnout includes a 12" flow control valve, a 12" mag-meter, and pressure transmitter to provided recycled water to Turner 1. The turnout is designed for flow rates ranging from 500 gpm to 6,000 gpm.

Cucamonga Creek Rubber Dam
Stormwater can be diverted to Turner Basin 1 using an inflatable rubber dam located in Cucamonga Creek just south of 4th Street. The Cucamonga Creek Rubber Dam includes a control house with a stilling well, 2.5 hp/154scfm air blower, and a 2" motor controlled vent valve.

Electrical System
Turner 1&2, the Turner 1 Recycled Water Turnout, and the Cucamonga Creek Rubber Dam share a common electrical system housed in the Cucamonga Creek Rubber Dam control house. The electrical energy to power these systems is obtained from the local electrical grid (SCE) through a meter on 4th Street. The system utilizes 120v power, does not have any transformers, and does not have emergency power generation.

Instrumentation and Control System
Turner Basins 1&2, the Turner Basin 1 Recycled Water Turnout, and the Cucamonga Creek Rubber Dam share a common instrumentation system housed in the Cucamonga Creek Rubber Dam control house. Local control wiring for gate positions, basin levels, flows, rubber dam pressures, stilling well levels, and vent valve position are fed back to a local PLC. This PLC has a radio antenna that transmits control data to the Almond Repeater and then to RP-1 to the GWR workstation server for control and remote access.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Turner Basin 1	*Basin* Area: 13.9 acres Depth: 38 ft Volume: 314.0 AF *Gates* 96" sluice gate 48" sluice gate 42" sluice gate	 Automated Automated Automated
Turner Basin 2	*Basin* Area: 4.0 acres Depth: 22 ft Volume: 51.7 AF	
Turner Basin 1 Recycled Water Turnout	*Flow Control Valve* 10" @ 500–6,000 gpm 12" mag-meter	
Cucamonga Creek Rubber Dam	*Rubber Dam* 4 ft tall rubber dam *Blower* 2.5 hp 154 scfm *Vent Valve* 2" ball valve	
Electrical Instrumentation	Utility Voltage: 120 v Transformers: N/A HMI: 1 unit RTU: N/A PLC: 1 unit I/O Hub: 3 units Radio: 1 unit	

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Turner Basin 1				
Basin	2	NA	2	NA
Gates	3	NA	3	NA
Turner Basin 2				
Basin	3	NA	3	NA
Turner Basin Recycled Water Turnout				
Flow Control Valve	3	NA	3	NA
Cucamonga Creek Rubber Dam				
Rubber Dam	3	NA	3	NA
Blower	3	NA	3	NA
Vent Valve	3	NA	3	NA
Electrical & Instrumentation	3	NA	3	NA

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

Cucamonga Creek Rubber Dam
The rubber dams were inspected in January 2015 and were determined to have a remaining lifespan of 5 years remaining. A potential project is needed within the next 5 years to replace the rubber dams.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Turner Basins 1	2004	
Turner Basins 2	2004	
Turner Basin 1 Recycled Water Turnout	2014	
Cucamonga Creek Rubber Dam	2004	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – GWR

Turner Basin 3 & 4C

1. Asset Profile

PROCESS FLOW SCHEMATIC
Turner Basins 2 – 4C

Turner Basins 3 – 4C
Tuner Basins are consist of multiple basins numbered Basins 1 through 8. The north 350' of Turner Basin 1 is owned by the Chino Basin Water Conservation District, while the remaining portions of Turner Basin 1&2 and Turner 3&4 and 8 are owned by the San Bernardino County Flood Control District (SBCFCD). Turner 5, 6, and 7 are owned by the San Bernardino County Parks Department. Turner 3&4 are located in the City of Ontario, south of 4th Street and west of Archibald Avenue. Turner 4 consists of three basins namely 4A, 4B, and 4C.

- *Turner Basin 3* – Turner Basin 3 receives flows from Turner Basin 4. Turner Basin 3 has an approximate size of 3.6 acres and an approximate sidewall depth of 25 feet from a floor elevation of 961' to the Deer Creek overflow structure at an elevation of 986' equating to 50.3 AF of storage. Turner Basin 3 has a level transmitter.
- *Turner Basin 4A* – Turner Basin 4A receives stormwater, imported water, and recycled water from Deer Creek and flows from Turner Basins 5 and 8. Turner Basin 4A has an approximate size of 8.9 acres and an approximate sidewall depth of 28 feet from a floor elevation of 962' to the Turner Basin 3 overflow structure at an elevation of 990' equating to 154.4 AF of storage. Turner Basin 4A includes a 30" automated sluice gate for the basin inlet from Deer Creek, a 30" automated sluice gate for discharge to Turner Basin 3, a 30" automated sluice gate for discharge to Turner Basin 4B & 4C, staff gauges, and a level transmitter.
- *Turner Basins 4B & 4C* – Turner Basins 4B & 4C receive flows from Turner Basin 4A. Turner Basins 4B & 4C. Turner Basins 4B & 4C include a 30" automated sluice gate for the basin inlet from Turner Basin 4 and a level transmitter. Turner Basin 4C also has a 24" manual gate for inlet from an unlined channel from Turner Basin 5.
- *Turner 8*
- *Turner 5.*
- *Turner 6 and 7* – Turner 6 and 7 are not part of the recharge program, These basins are fishing lakes just south of Turner 5 and 8 in Guasti Regional Park.

Deer Creek Recycled Water Turnout
The Deer Creek Recycled Water Turnout is located at the intersection of 4th Street and Turner Avenue. The turnout includes a 10" Cla-Val flow control valve, flow meter, and pressure transmitter to provided recycled water to Deer Creek. Recycled Water discharged in the lined creek can then be conveyed to Turner 1 and/or Turner 3&4 for groundwater recharge. The turnout is designed for flow rates ranging from 300 gpm to 3,500 gpm.

CB 11 MWD Imported Water Turnout
The CB 11 MWD Imported Water Turnout is located near the intersection of Banyan Street and Haven Avenue in the City of Rancho Cucamonga. The turnout includes a 24" vertical sleeve type, motor operated control valve, a 24" Venturi meter, and a pressure transmitter to provided imported water to the Haven Avenue storm drain, which leads to Deer Creek. The turnout is designed for flow rates ranging from 1,500 gpm to 18,000 gpm.

Electrical System

- *Turner Basins 3&4* – The electrical energy to Turner Basins 3&4 is obtained from the local electrical grid (SCE) through a meter on Archibald Avenue The system utilizes 120v power, does not have any transformers, and does not have emergency power generation.
- *Deer Creek Recycled Water Turnout* – The electrical energy to power the Deer Creek Recycled Water Turnout is obtained from the local electrical grid (SCE) through a meter on Turner Avenue The system utilizes 120v power, does not have any transformers, and does not have emergency power generation.
- *Imported Water Turnout* – The electrical energy to power the CB 11 MWD Imported Water Turnout is obtained from the local electrical grid (SCE) through a meter on Banyan Street. The system utilizes 120v power, does not have any transformers, and does not have emergency power generation.

Instrumentation and Control System

- *Turner Basins 3&4* – Local control wiring for flow, valve position, and basin levels for Turner Basins 3&4 are fed back local PLC. The local PLC has a radio antenna that transmits control data to the Almond Repeater and then to RP-1 to the GWR workstation server for control and remote access.
- *Deer Creek Recycled Water Turnout* – Local control wiring for flow and valve position are fed back to a local control panel and PLC. The turnout has a 9dB yagi antenna that transmits control data to RP-4, which routes the information to RP-1 to the GWR workstation server for control and remote access.
- *Imported Water Turnout* – Local control wiring for flow and valve position are fed back to a local PLC. The turnout PLC has a radio antenna that transmits control data to the Almond Repeater and then to RP-1 to the GWR workstation server for control and remote access.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Turner Basin 3	*Basin* Area: 3.6 acres Depth: 25 ft Volume: 50.3 AF	
Turner Basin 4	*Basin* Area: 8.9 acres Depth: 28 ft Volume: 154.4 AF *Gates* 3 - 30" sluice gates	Automated
Turner Basin 4B&C	*Gates* 2 - 30" sluice gates 24" sluice gate	Automated Manual
Deer Creek Recycled Water Turnout	*Flow Control Valve* 10" @ 300–3,500 gpm	w/ flow meter
CB 11 MWD Imported Water Turnout	*Flow Control Valve* 24" @ 1,500-18,000 24" Venturi Flow Meter	gpm
Electrical Instrumentation	Utility Voltage: 120 v Transformers: N/A HMI: N/A RTU: 2 unit PLC: 2 unit I/O Hub: 2 unit Radio: 2 unit	

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Turner Basin 3				
Basin	3	NA	3	NA
Turner Basin 4				
Basin	3	NA	3	NA
Gates	3	NA	3	NA
Turner Basin 4 B & C				
Basin	3	NA	3	NA
Gates	3	NA	3	NA
Deer Creek Recycled Water Turnout				
Flow Control Valve	3	NA	3	NA
CB 11 MWD Imported Water Turnout				
Flow Control Valve	3	NA	3	NA
Electrical & Instrumentation	3	NA	3	NA

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

NA
No issues that require immediate attention.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Turner Basin 3	2004	
Turner Basin 4	2004	
Turner Basins 4 B& C	2014	
Deer Creek Recycled Water Turnout	2006	
CB 11 MWD Imported Water Turnout	2004	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – GWR
Upland Basin

1. Asset Profile

PROCESS FLOW SCHEMATIC
Upland Basin

Upland Basin
Upland Basin is owned by the City of Upland and is located, near the intersection of Monte Vista Avenue and Arrow Route. Upland Basin receives stormwater and imported water from the San Antonio Channel and stormwater from a local storm drain system. Upland Basin has an approximate size of 24.8 acres and an approximate sidewall depth of 65 feet from a floor elevation of 1145' to the San Antonio Channel overflow structure elevation of 1210' equating to 847.5 AF of storage. Upland Basin includes a 48" automated sluice gate with associated flow meter for inlet flow from the San Antonio Channel and a level transmitter. IEUA contributed to construction and has an agreement for use of 200 AF storage in Upland Basin

San Antonio Channel Rubber Dam
A 4' tall rubber dam has been installed into the San Antonio Channel to divert stormwater and imported water to Upland and College Heights Basins from 1240' to 1244'. The San Antonio Channel Rubber Dam includes a control house with a stilling well, 2.5 hp/154scfm air blower, and a 2" motor controlled vent valve.

Electrical System
The College Heights Basin, Upland Basin, and the San Antonio Channel Rubber Dam share a common electrical system housed in the San Antonio Channel Rubber Dam control house. The electrical energy to power College Heights Basin, Upland Basin, and the San Antonio Channel Rubber Dam is obtained from the local electrical grid (SCE) through a meter on Arrow Route. The system utilizes 120v power, does not have any transformers, and does not have emergency power generation.

Instrumentation and Control System
The College Heights Basin, Upland Basin, and the San Antonio Channel Rubber Dam share a common instrumentation and control system housed in the San Antonio Channel Rubber Dam control house. Local control wiring for gate positions, basin levels, flows, rubber dam pressures, stilling well levels, and vent valve position are fed back to a local PLC. The PLC has a radio antenna that transmits control data to the Almond Repeater and then to RP-1 to the

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Upland Basin	*Basin* Area: 24.8 acres Depth: 59 ft Volume: 694.9 AF *Gates* 48" sluice gate	Automated
San Antonio Channel Rubber Dam	*Rubber Dam* 4 ft tall rubber dam *Blower* 2.5 hp 154 scfm *Vent Valve* 2" ball valve	
Electrical Instrumentation	Utility Voltage: 120 v Transformers: N/A HMI: 1 unit RTU: N/A PLC: 1 unit I/O Hub: 2 units Radio: 1 unit	

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Upland Basin				
Basin	3	NA	3	NA
Gates	3	NA	3	NA
San Antonio Channel Rubber Dam				
Rubber Dam	3	NA	3	NA
Blower	3	NA	3	NA
Vent Valve	3	NA	3	NA
Electrical & Instrumentation	3	NA	3	NA

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

San Antonio Channel Rubber Dam
The rubber dams were inspected in January 2015 and were determined to have a remaining lifespan of 5 years remaining. A potential project is needed within the next 5 years to replace the rubber dams.

Table 3 History of Select Assets

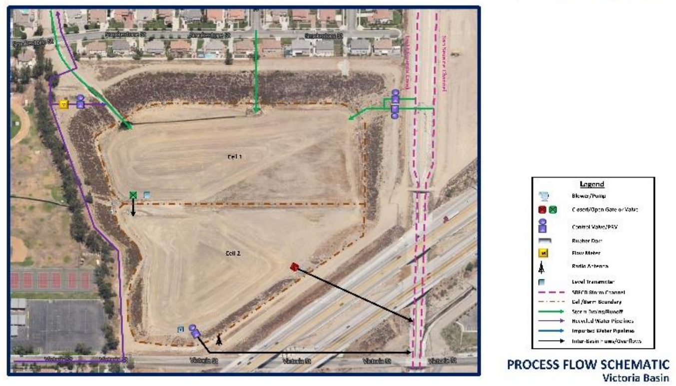
System	Capital Improvement Project Activity	Condition Assessment Report
Upland Basin	2004	
San Antonio Channel Rubber Dam	2004	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – GWR
Victoria Basin
1. Asset Profile



PROCESS FLOW SCHEMATIC
Victoria Basin

Victoria Basin
Victoria Basin is owned by the San Bernardino County Flood Control District (SBCFCD) and is located in the City of Rancho Cucamonga, near the intersection of Victoria Avenue and the 15 Freeway. Victoria Basin is comprised of two cells: North Cell and South Cell:

- *Victoria Basin North Cell* – Victoria Basin North Cell receives stormwater and imported water from the San Sevaine Channel and Etiwanda Creek, recycled water from the Victoria Basin Recycled Water Turnout, and stormwater from a local storm drain system. Victoria North Cell has an approximate size of 9.6 acres and an approximate sidewall depth of 4 feet from a floor elevation of 1314' to the Victoria Basin South Cell overflow structure at an elevation of 1318' equating to 28.5 AF of storage. Victoria Basin North Cell includes two 48" automated sluice gates for inlet into the basin from the San Sevaine Channel and East Etiwanda Creek, a 36" automated sluice gate for discharge to Victoria Basin South Cell , and a level transmitter.
- *Victoria Basin South Cell* – Victoria Basin South Cell receives flow from Victoria Basin North Cell . Victoria Basin South Cell has an approximate size of 7.8 acres and an approximate sidewall depth of 9 feet from a floor elevation of 1309' to the San Sevaine Channel overflow structure at an elevation of 1318' equating to 47.1 AF of storage. Victoria Basin South Cell includes a 36" automated sluice gate for discharge to the San Sevaine Channel and a level transmitter.

Victoria Basin Recycled Water Turnout
The Victoria Basin Recycled Water Turnout is located on the west side of Victoria Basin North Cell. The turnout includes an 8" Cla-Val flow control valve, flow meter, and pressure transmitter to provided recycled water to the groundwater recharge basin. The turnout is designed for flow rates ranging from 200 gpm to 3,000 gpm.

Electrical System
The electrical energy to power Victoria Basin and the Victoria Basin Recycled Water Turnout is obtained from the local electrical grid (SCE) through a meter on Victoria Street. The system utilizes 120v power, does not have any transformers, and does not have emergency power generation.

Instrumentation and Control System
Local control wiring for flow, valve position, gate positions, and basin levels are fed back to a local control panel and PLC, which transmits control data to the Victoria Basin Main RTU. The Victoria Basin Main RTU has a radio that transmits control data to RP-4, which routes the information to RP-1 to the GWR workstation server for control and remote access.

2. Capacity Profile
Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Victoria Basin Cell 1	<u>Basin</u> Area: 9.6 acres Depth: 4 ft Volume: 28.5 AF <u>Gates</u> 2 - 48" sluice gate 36" sluice gate	 Automated Automated
Victoria Basin Cell 2	<u>Basin</u> Area: 7.8 acres Depth: 9 ft Volume: 47.1 AF <u>Gates</u> 36" sluice gate	 Automated
Victoria Basin Recycled Water Turnout	<u>*Flow Control Valve*</u> 8" @ 200–3,000 gpm 8" mag-meter	
Electrical Instrumentation	Utility Voltage: 120 v Transformers: N/A HMI: 1 unit RTU: 1 unit PLC: 1 unit I/O Hub: 2 units Radio: 3 units	

3. Asset Ratings
Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Victoria Basin Cell 1				
Basin	3		3	
Gates	3		3	
Victoria Basin Cell 2				
Basin	3		3	
Gates	3		3	
Victoria Basin Recycled Water Turnout				
Flow Control Valve	3		3	
Electrical & Instrumentation	3		3	

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation
NA
No issues that require immediate attention.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Victoria Basin Cell 1	2004	
Victoria Basin Cell 2	2004	
Victoria Basin Recycled Water Turnout	2011	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

<u>End of System Summary</u>

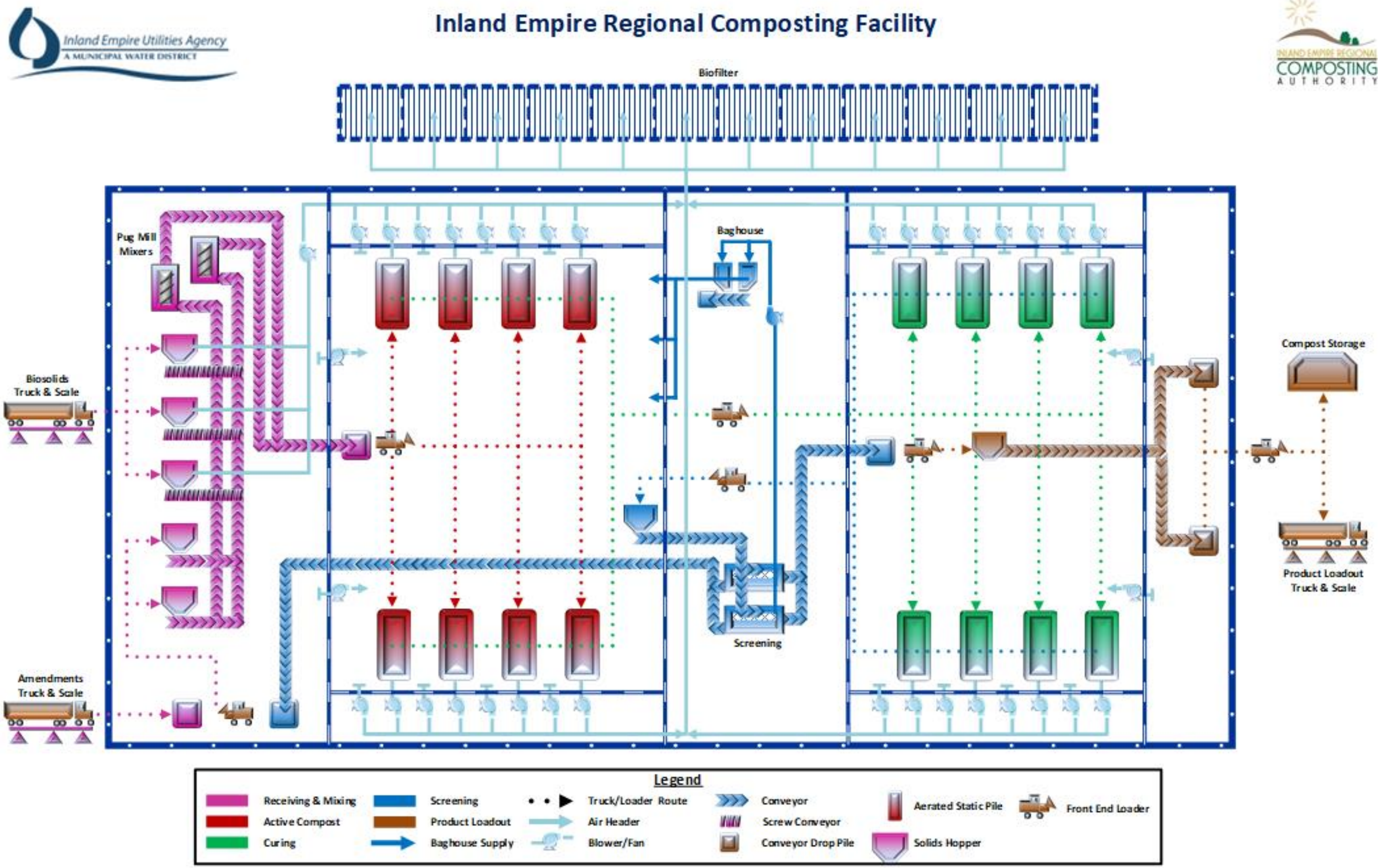


Figure 7-9: Inland Empire Regional Composting Facility (IERCF) – Schematic

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Table 7-8: Inland Empire Regional Composting Facility – Project Summary

#	Project Number[1]	Project Name	Project Description	Fund[2]	Project Type[3]	Fiscal Year Budget (Dollars)										
						2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Ten-Year Total

(1) Project Number – from Ten-Year Capital Improvement Project; Final Capital Project List 03-17-2014
(2) Project Fund – Administrative Services (GG), Non-Reclaimed Water (NC), Regional Composting Authority (RM), Ground Water Recharge (RW), Recycled Water (WC), Regional Capital (RC), Regional O&M (RO), or Water Fund (WW)
(3) Project Type – Capital Construction Project (CC), Capital Major Equipment Project (EQ), Operations & Maintenance Project (OM), Reimbursable Project (RE), or Capital Replacement Project (RP)

Asset Management System Summary – IERCF
Treatment Process
1. Asset Profile

Biosolids Hoppers
Biosolids from Los Angeles County Sanitation District (LACSD), Inland Empire Utilities Agency, and third-party sources are transported by trucks to the Inland Empire Regional Composting Facility (IERCF). After being weighed, the trucks offload the biosolids into three biosolids hoppers. Each biosolids hopper has a capacity of 55 cubic yards, five 3 hp live-bottom screws, and one 25 hp screw conveyor.

Amendment Hoppers
Amendments from outside sources are transported to IERCF by truck and stored along the western wall of the active compost process area. These amendments are mixed with recycled screening material (overs) to produce specific amendment blends. Front end loaders mix the material and load it into two amendment hoppers. Each amendment hopper has a 200-ton capacity, five 3 hp live-bottom screws, and one 33-foot, 110-ton-per-hour belt conveyor powered by a 15 hp motor.

Pug Mill Mixers
Material from the biosolids hoppers and the amendment hoppers is conveyed by belt conveyors to two redundant pug mill mixers. The pug mill mixers blend the biosolids and amendments together to create an appropriate blend of material to begin the active compost process. Each pug mill mixer has a capacity of 225 tons per hour and is powered by a 75 hp motor.

Belt Conveyors
Belt conveyors are used to move material throughout IERCF. Nine belt conveyors allow material to be moved from receiving and mixing to active compost. Seven belt conveyors allow material to be moved from active compost through screening to curing. An additional four belt conveyors return the overs from screening to receiving and mixing. Two belt conveyors allow material to be moved from curing to product loadout.

Active Compost HVAC
Supply air into the active compost process area is provided by seven 20 hp fans dedicated to receiving and mixing, nine 20 hp roof fans, and five 75 hp dedicated to the screening/baghouse. Air is exhausted from the active compost area to the biofilter by four 125 hp exhaust fans, twelve 125 hp exhaust fans, and twenty-two 30 hp process fans.

Curing HVAC
Supply air into the curing process area is provided by four 25 hp fans pulling from product loadout, five 10 hp roof fans, and fourteen 20 hp process fans. Air is exhausted from the active compost area to the biofilter by four 150 hp exhaust fans and two 125 hp exhaust fans.

Trommel Screens
After the material has been treated in the active compost and curing processes, it is placed into a hopper and conveyed to two Trommel screens to remove the overs. The fine material is conveyed to product loadout as the final compost product and the overs are conveyed back to receiving and mixing to be recycled back into the amendments. Each Trommel screen has 3/8-inch spacing and a 400-cubic-yard-per-hour production capacity and is powered by a 150 hp motor.

Baghouse
The Baghouse filters the air from the Trommel screens and the screenings process area and returns filtered air back to the active compost process area. The Baghouse is supplied by five 75 hp, 25,650 cfm fans and removes particulate matter from the air and conveys it to a storage area located in the screenings process area.

Biofilter
The biofilter is required to treat all air leaving IERCF to remove ammonia and VOCs. The biofilter is sized to treat 813,200 cfm of air, consists of twelve 135' x 87' cells, an irrigation system, and an inlet air humidification system. Full replacement of the biofilter media in all 12 cells, recurring every 5 years. Turnover of existing biofilter media and replenishment of material as necessary, annually (not done on years of a full media replacement).

Rolling Stock and Storage Tent
Front end loaders move material to the amendment hoppers, and then are used as the primary equipment to transfer material throughout the composting process: active composting, curing, screening, product loadout, cleanup, and for biofilter media turnover and replacement activity. Product compost is stored in a 30,000 cubic yard storage tent.

2. Capacity Profile
Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Facility Biosolids Amendment	 600 wet tons per day 160 wet tons per day	
Biosolids Hoppers	3 @ 55 cy 5 @ 3 hp live bottom 1 @ 25 hp sc. conv.	 ea. hop. ea. hop.
Amendment Hoppers	2 @ 200 tons 5 @ 3 hp live bottom 1 @ 15 hp belt conv.	 ea. hop. ea. hop.
Pug Mill Mixers	2 @ 75 hp, 225 tph	
Receiving & Mixing Belt Conveyors	1 @ 20 hp, 162 ft 1 @ 20 hp, 144 ft 1 @ 25 hp, 70 ft 1 @ 25 hp, 91 ft 1 @ 25 hp, 80 ft 1 @ 25 hp, 75 ft 1 @ 30 hp, 215 ft 1 @ 30 hp, 219 ft 1 @ 30 hp, 258 ft	All units are 225 tons per hour (tph)
Belt Conveyors Screening Product Loadout	 2 @ 20 hp, 91', 150tph 1 @ 15 hp, 133', 150tph 2 @ 15 hp, 27', 150tph 1 @ 25 hp,157', 190tph 1 @ 25 hp, 136', 190tph 1 @ 15 hp, 32', 110tph 1 @ 15 hp, 77', 110tph 1 @ 20 hp, 172', 110tph 1 @ 30 hp, 537', 110tph 1 @ 20 hp, 135', 145tph 1 @ 15 hp, 113', 145tph	
Active Compost HVAC	7 @ 20 hp, 18,250cfm 9 @ 20 hp, 23,000cfm 5 @ 75 hp, 25,650cfm 4 @ 125 hp, 35,500cfm 12 @ 125 hp, 28400cfm 22 @ 30 hp, 4,500 cfm	R&M Fan Roof Fan BH Fan Ex. Fan Ex. Fan Pr. Fan
Curing HVAC	4 @ 25 hp, 20,500 cfm 5 @ 10 hp, 18,000 cfm 14 @ 20 hp, 2,850 cfm 4 @ 150 hp, 42,250 cfm 2 @ 125 hp, 35,000 cfm	PL Fan Roof Fan Pr. Fan Ex. Fan Ex. Fan
Trommel Screens	2 @ 3/8-inch, 150 hp, 400 cyh	
Baghouse	2 @ 65,000 cfm 5 @ 75 hp, 25,650 cfm	Filters Fans
Biofilter Humidification System	813,200 cfm 1,000 nozzles	
Rolling Stock Composting Loader Product Loader Storage Tent	 4 @ Model 744 3 @ Model 644 30,000 cu.yd.	 John Deere John Deere Capacity

3. Asset Ratings
Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Biosolids Hoppers	2	3	2	2
Amendment Hoppers	3	3	2	2
Pug Mill Mixers	4	3	2	3
Receiving & Mixing Belt Conveyors	2	3	2	3
Screening Belt Conveyors	2	3	2	3
Active Compost HVAC	4	4	3	3
Curing HVAC	4	4	3	3
Trommel Screens	4	3	3	4
Baghouse	3	2	2	2
Biofilter	2	2	2	2
Rolling Stock & Storage Tent	4	3	3	3

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation
Amendment Hoppers
Modified the hardened steel floor so material does not bridge, but wearing frequently. No project needed at this time.

Pug Mill Mixer
Only one redundant paddle mixer and has been operating since ~2007. A replacement may be needed in the near future. Floor of trough is repaired frequently. Installing ceramic coating on floor to reduce repair frequency. No project needed at this time.

Receiving & Mixing Belt Conveyors
Belt #11 has no redundancy. Spare parts are stored onsite to make repairs when needed. No project needed at this time.

Screening Belt Conveyors
Spare parts are stored onsite to make repairs when needed. Impractical to build a fully redundant system. No project needed at this time.

Active Compost HVAC
Roof supply fans (4) have poor access and the supports are corroding. A potential project is needed to address this issue. In addition, the process fans (4) have no redundancy. Spare parts are stored onsite for Maintenance to make repairs when needed. Impractical to build a fully redundant system. No project needed at this time.

Curing HVAC
A temporary fix in place for leaks along the screening's air duct. Loadout axial fan is in poor condition, and in-house repairs are being made to improve reliability. Project RA17001 will modify the foul-air-rectangular-transition air duct running north/south through screenings

Trommel Screens
Converted both screes to move the same size product. Redundancy will be lost if the process returning to two different sized products. Screen No.1 was rebuilt in 2014/15, but there is uncertainty of the cost in a future rebuild. No project needed at this time.

Baghouse
North of the building's centerline was retrofitted in 2014/15. The southern portion needs to be modified from rectangular duct to round duct. A project has been approved to upgrade this section of duct, but is not in the TYCIP.

Rolling Stock & Storage Tent
Two of the Model 744 units have 13,000 hours of operation. Replacement is recommended after 15,000 hours. In addition, the tent was installed in 2010 and has a ten year warranty. A potential project is needed to replace the front end loaders, but a project is not needed at this time for tent replacement.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Biosolids Hoppers	2007	
Amendment Hoppers	2007	
Pug Mill Mixers	2007	
Receiving & Mixing Belt Conveyors	2007	
Belt Conveyors	2007 2015	
Active Compost HVAC	2007	
Curing HVAC	2007	
Trommel Screens	2007 2013	
Baghouse	2007	
Biofilter	2007	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – IERCF

Auxiliary Systems

1. Asset Profile

Plant Drain
The plant drain collects sewer from the truck scale house and administration building, wash-down water from the truck cleaning area and process areas, and excess irrigation and condensate from the biofilter system. The plant drain system consists of five submersible pump stations: north process area, south process area, biofilter west, biofilter east, and center aisle duct. These five pump stations pump to the plant drain pump station. The plant drain pump station pumps to either the inlet of RP-4 or to the Non-Reclaimable Waste System (NRWS). Currently, the system is being pumped to the NRWS.

Electrical System
The electrical energy to power the treatment facility is obtained from the local electrical grid (SCE) and from onsite energy generation (solar and an emergency generator). The solar assets are owned and operated by private firms as part of power purchase agreements. The electrical feed from the grid is composed of dual 12 kV feeders from RP-4 to the IERCF north and south electrical rooms, where transformers and switchgear are located to distribute electrical energy throughout the facility. A single line diagram of the IERCF electrical system is shown in Appendix B.

A diesel emergency generator is used in the event of a power failure. A 2.0 MW generator is located on the southeast corner of the IERCF property and can supply power to meet maximum daytime production of the facility.

An extensive lighting system is needed to illuminate the indoor facility. Lighting units are located in each of the process areas, on equipment walls, and on the building support columns.

Utility Water System
Utility water is used throughout the facility for irrigation, biofilter irrigation and humidification, truck wash-down, and general cleaning purposes. The system is supplied by the 1299 pressure zone from a connection on 6th Street. The piping consists of several isolation valves and point-of-use connections.

Potable Water System
Potable water is used throughout the plant for restrooms, cooling, and more. The system is supplied from two service connections on 6th Street from the City of Rancho Cucamonga. IERCF also has an independent fire suppression system with two connections on 6th Street.

Instrumentation and Control System
An extensive array of instruments is used to monitor and control the processes at IERCF. Nearly all of the processes at the plant are observed and controlled from a centralized SCADA system. Control wiring and local panels are provided at individual pieces of equipment, and control wiring transmits data to a redundant PLC system located in the main control building. Fiber optic cable is then run to RP-4 for remote access.

Yard Piping
A substantial network of pipes exists mainly for the auxiliary systems. The material, sizes, and service conditions of these pipes vary widely.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Plant Drain	3 @ 620 gpm 20 hp	VFD
Electrical System		
Utility Voltage	12 kV	
Transformers	4 @ 12 kV to 480 V 5 @ 480 V to 120 V	
Switchgear	4 @ 12 kV 2 @ 12 kV	
Distribution	8 @ 480 V	MCCs
Generator	1 @ 2,000 kW 2,937 Bhp	
Mounted Lighting	345 units	Process
Utility Water System		
Pipelines	8-inch PVC @ 3,750 gpm	
Valves	6-inch PVC @ 2,100 gpm 5 units	Main Line
Potable Water System		
Pipelines	2 @ 2.5-inch DI @ 350 gpm 10-inch DI @ 5,800 gpm	Potable Fire
Instrumentation and Control System		
HMI Workstation	4 units	
RTU	N/A	
PLC	4 units	
I/O Hub	6 units	
Radio Transmitter	1 unit	RP-4
Structure		
Administration	30.0 ft X 62.5 ft	
Warehouse	67.7 ft X 60.0 ft	
Operations	52.9 ft X 59.6 ft	

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Plant Drain	3	2	2	2
Electrical System	2	2	3	3
Utility Water System	3	3	3	3
Potable Water System	4	3	3	3
Instrumentation and Control System	3	2	3	3
Yard Piping	3	3	3	3
Structure	4	4	3	3

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

Plant Drain
No issues require specific attention.

Electrical System
No issues require specific attention.

Utility Water System
No issues require specific attention.

Potable Water System
A potential project will retrofit the fire sprinkler system pipelines and Victaulic fittings.

Instrumentation and Control System
No issues require specific attention.

Yard Piping
No issues require specific attention.

Structures
Additional warehouse storage space for critical equipment, office space is needed, and the conference room needs to be retrofitted and expanded to service large meetings. 3,000 sq ft of additional space is needed for the warehouse and office space, but an estimate has not been established for the conference room. A potential project is needed to address these issues.

In addition, the process building's protective coating for the inner roof lining is deteriorating; the epoxy has failed and the foam barrier is retaining moisture. The coating protects the infrastructure in the drop ceiling. A potential project is needed to address this issue.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Plant Drain	2007	
Electrical System	2007 2011	
Utility Water System	2007	
Potable Water System	2007	
Instrumentation and Control System	2007	
Yard Piping	2007	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

<u>End of System Summary</u>

Agency Lift Stations

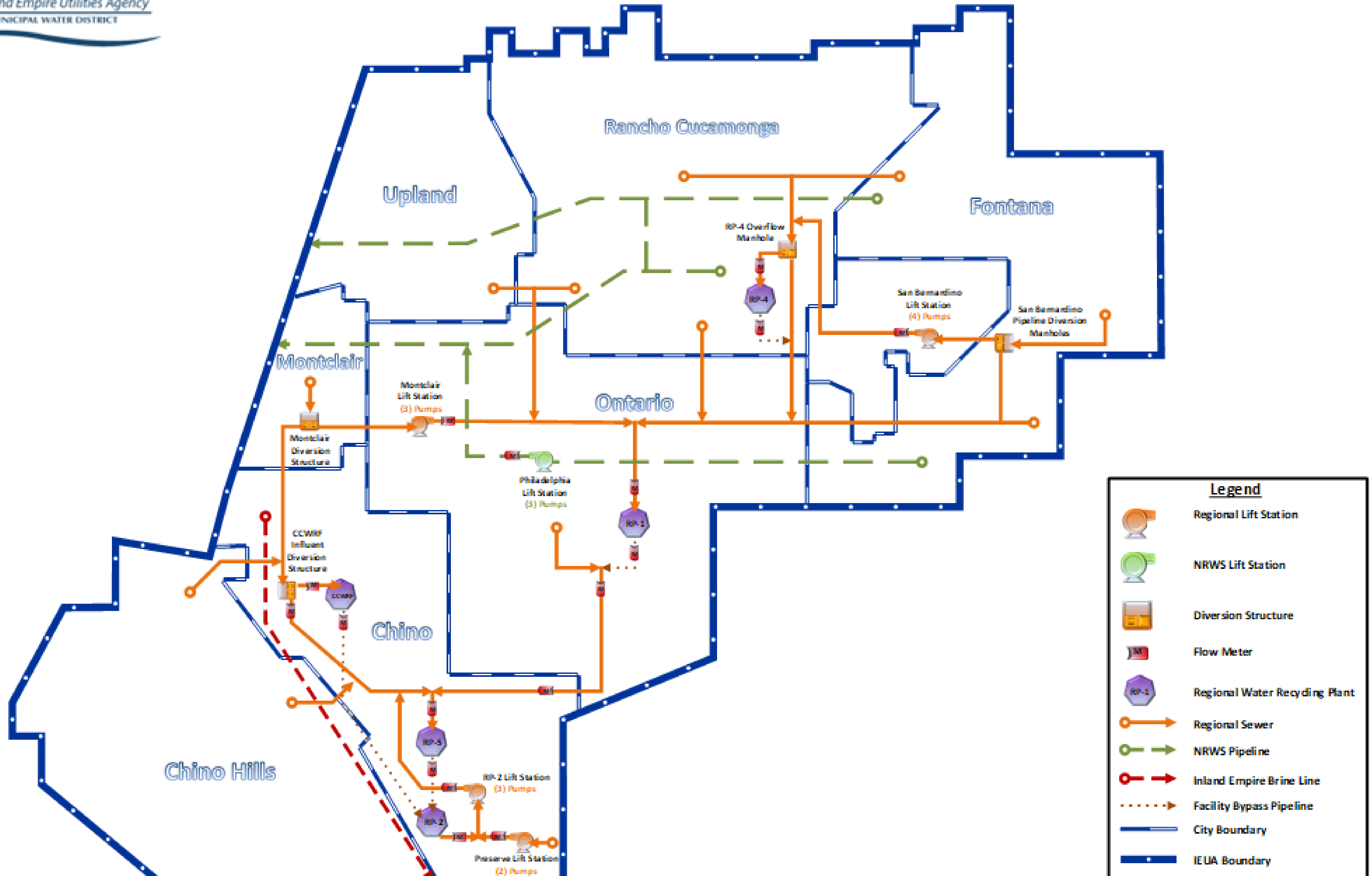

Figure 7-10: Agency Lift Stations (LS) – Schematic

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Table 7-9: Agency Lift Stations – Project Summary

#	Project Number[1]	Project Name	Project Description	Fund[2]	Project Type[3]	Fiscal Year Budget (Dollars)										
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Ten-Year Total
1	EN22048	Generator Retrofit – PLS (James Simpson)	New state of the art digital control panels and CAT digital voltage regulators shall be installed for Philadelphia Lift Station Generators.	NC	CC	80,000										80,000
2	EN23002	Philadelphia Lift Station Force Main Improvements (Josh Biesiada)	The objectives of the project are to design and construct two new non-reclaimable waste force main pipelines from the Philadelphia Lift Station to a new junction structure on the Northern NRWS Center Trunk at Campus Avenue with clean out manholes at 500 ft intervals. [Scope Removal] design and construct emergency overflow protection with a passive overflow into the regional sewer pipeline, and line the emergency overflow reservoir with impermeable material (i.e. concrete, EPDM rubber, etc.).	NC	RP	7,163,000	11,350,000	1,000,000	0	0	0	0	0	0	0	19,513,000
3	EN22020	Philadelphia Lift Station Pump Upgrades (Josh Biesiada)	Replace pumps with newer style non-clog dry pit submersible pumps similar to Montclair LS. These will provide higher efficiency and an easier to service and maintain. VFD's will need to be upgraded as well.	NC	RP	329,000	400,000	4,000,000	2,000,000	0	0	0				6,729,000
4	EN23066	Preserve Lift Station Improvements (Megan Trott)	Remove non-clog pump no. 1 and install into pump no. 3's location. Install the mechanical accessories, electrical and control equipment necessary to operator the third pump. This will require purchasing a new VFD and bypass electrical cabinet, extended cover for the electrical, conduit, air conditioning units, and electrical accessories. Purchase and install a new chopper in pump no. 1's location. IEUA internal support will consist of project management (design through construction) and Operation's assistance during installation and start up. A design consultant will be hired for the electrical design and construction during installation and start up. A design consultant will be hired for the electrical design and construction support. IEUA's Integrated System Services (ISS) Department will be involved with the re-writing of the Process Control Narratives which is included in the internal support.	RO	OM	455,000	0	0	0	0	0	0	0	0	0	455,000

#	Project Number[1]	Project Name	Project Description	Fund[2]	Project Type[3]	Fiscal Year Budget (Dollars)										
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Ten-Year Total
5	EN23036	San Bernardino Ave Lift Station Reliability Improvements (Jamal Zughbi)	The following are Operations and Maintenance's expectations and corresponding recommendations. Install chopper pumps or other available technologies to alleviate ragging of the pumps, pump Station bypass will be addressed under a separate future project, install an access hatch(es) at the lift station wet well near the low point for maintenance and collection cleaning, retain a consulting engineering firm for design and construction services, and pave the existing graveled area around the pumps and install a 20-ft wide apron at the entry location. This will require removing part of the existing fence. Also, the project will install a manway access to the wet well.	RO	CC	500,000	1,200,000	300,000								2,000,000
6	EN19025	Montclair and San Bernardino Lift Station Force Main Clean Out Vaults (Josh Biesiada)	The objectives of the Montclair and San Bernardino Avenue Clean Outs project is to design, and construct clean out vaults every 500 feet on the existing San Bernardino Avenue Lift Station force main pipelines (24" and 30" ductile iron pipelines). [Scope Removal]: Evaluate the existing clean out vaults located on the Montclair Lift Station force main, and design and construct clean out vaults every 500 feet on the existing Montclair Lift Station force main. This scope will be deferred to a future project that will construct a new force main alongside the existing Montclair force main.	RC	CC	704,500	0	0	0	0	0	0	0	0	0	704,500
7	EN22028	Philly RW Gravity Line Abandonment (Jason Marseilles)	Remove the manhole structure and pipeline within the recharge basin and basin levee. Seal the gravity pipeline at the manhole located outside the levee and remove the manhole structure. The goal is to seal the pipeline section that could potentially drain the recharge basin should the pipeline develop a failure point over time.	WC	OM	0	250,000	250,000	0	0	0	0	0	0	0	500,000
8	EN21045	Montclair Force Main Improvements (Jamal Zughbi)	The project will include the design and construction of a new pipeline of approximately 4,000 LF. The preliminary design report and the final design is expected to take one year for completion; construction is expected to	RC	CC	1,040,000	4,800,000	2,600,000								8,440,000

#	Project Number[1]	Project Name	Project Description	Fund[2]	Project Type[3]	Fiscal Year Budget (Dollars)										
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Ten-Year Total
			take 1.5 years as Caltrans permitting will likely be required													

(1) Project Number – from Ten-Year Capital Improvement Project; Final Capital Project List 03-17-2014
(2) Project Fund – Administrative Services (GG), Non-Reclaimed Water (NC), Regional Composting Authority (RM), Ground Water Recharge (RW), Recycled Water (WC), Regional Capital (RC), Regional O&M (RO), or Water Fund (WW)
(3) Project Type – Capital Construction Project (CC), Capital Major Equipment Project (EQ), Operations & Maintenance Project (OM), Reimbursable Project (RE), or Capital Replacement Project (RP)

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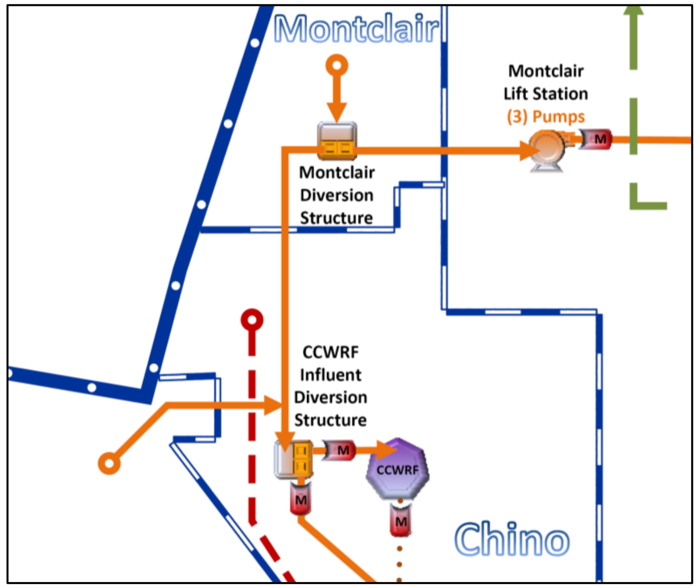
Asset Management System Summary – LS

Montclair Lift Station

1. Asset Profile



Pump System
The Montclair lift station conveys flows collected from the Montclair service area as well as a portion of Ontario. The pump station consists of a small circular wet well and three lift pumps.

Electrical System
The electrical energy to power the lift station is obtained from the local electrical grid (SCE). The electrical feed from the grid is composed of a 12 kV feeder to the transformer and switchgear. A single line diagram of the Montclair lift station electrical system is shown in Appendix B.

A diesel emergency generator is used in the event of a power failure. One generator is located inside the pump station and supplies power to the facility in the event of a utility outage.

Potable Water System
Potable water is supplied to the station for supply at several hose bibs. The water system formerly supplied seal water to the old pumps.

Instrumentation and Control System
All aspects of the pump station operations are monitored and controlled by the instrumentation and control system. The control system includes a redundant PLC and communication modules for maximum reliability.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Montclair Lift Station	5.69 MGD	
Pump System Pipelines Pump Station Valves	 18-inch 3,950 gpm 3 @ 2,990 gpm 85 hp 7 units	
Electrical System Utility Voltage Transformers Switchgear Distribution Generator Mounted Lighting	 12 kV 12 kV to 480 V 480 V 480 V 1 @ 250 kW 398 Bhp 17 units	
Potable Water System Backflow Devices Valves	 1 units 2 units @ 2-inch	
Instrumentation and Control System HMI Workstation PLC I/O Hub Radio Transmitter	 1 Ea. 2 Ea. (Redundant Pair) 1 Ea. 1 Ea.	

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Pump System	2	2	2	2
Electrical System	3	3	3	4
Potable Water System	3	3	3	3
Instrumentation and Control System	2	2	2	2

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

Issues with pump no. 1 with false comm issues to SCADA. DCS, E&I and Schneider investigated once. Need to follow up (10/12/22)

Very short power blips have caused issues to the VFDs with properly restarting back up generator automatically. (10/12/22)

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Pump System	1978 2014	
Electrical System	1978 2014	
Potable Water System	1978	
Instrumentation and Control System	1978 2014	

* Appendix B – Condition Assessment Reports

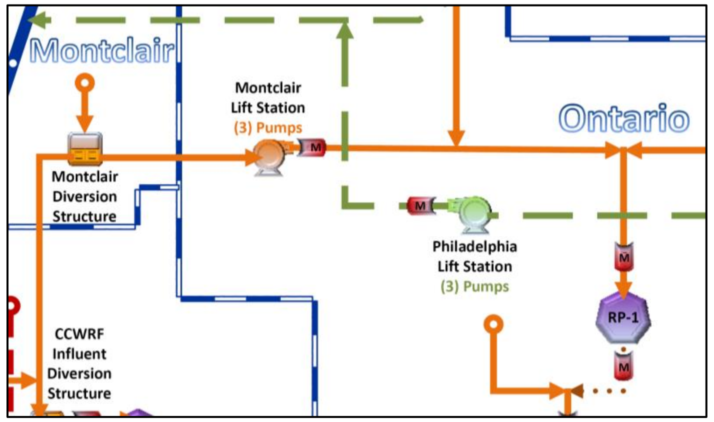
Table 4 Potential Projects

System	Project Name	Project Description
Force Main	EN19025 Montclair and San Bernardino LS Force Main Clean Out	Design and construct clean out vaults every 500ft on the existing San Bernardino Avenue, evaluate the existing clean out vaults located on the Montclair LS force main, and design and construct clean out vaults every 500 feet on the existing Montclair Lift Station force main
Force Main	EN21045 Montclair Force Main Improvements	Design and construction of a new pipeline of approximately 4,000 LF

Asset Management System Summary – LS

Philadelphia Lift Station

1. Asset Profile



Pump System
The Philadelphia lift station conveys non-reclaimable waste (NRW) That is collected from the northern half of the Agency service area to Los Angeles County. The lift station includes three pumps: two of which are variable speed and one that is constant speed. Flows are conveyed through two parallel force mains that are about 2.6 miles long, with a total head increase of about 110 feet.

In case of emergency and to accommodate maintenance and construction activity, an engine-driven pump is also available. The pump connections are located outdoors, and the pump can be trailered away off-site when it is not needed.

Electrical System
The electrical energy to power the treatment facility is obtained from the local electrical grid (SCE). The electrical feed from the grid is 480 V. A single line diagram of the electrical system is shown in Appendix B.

A diesel emergency generator is used in a power failure. The generator is located in the pump station and supplies power to all the pump station systems.

Utility Water System
Utility water is used for pump seal water. The water is delivered by the 1050 zone recycled water pipeline in Philadelphia Avenue.

Potable Water System
Potable water is supplied to the lift station for the restroom. Potable water can also be used as a backup for pump seal water in a recycled-water outage. The potable and recycled water is isolated by use of a removable pipe spool to prevent cross connections.

Instrumentation and Control System
The lift station is fully automated and monitored. Wet well level, force main discharge pressures, force main flows, and pump speeds are all controlled and monitored by a PLC. The lift station can also be monitored and controlled remotely.

Chemical Injection System
The lift station includes storage and injection systems for ferric chloride. The chemical can be injected to both force mains. Ferric chloride is used to control sulfides in the sewer system, reducing the effects of corrosion and odors. The injection pumps are started and stopped automatically.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Philadelphia Lift Station	5.2 MGD	
Pump System Pipelines Pump Station Wet Well Emergency Lagoon Valves	 12-inch 1,150 gpm 18-inch 2,800 gpm 3 @ 1,800 gpm 100 hp 80,000 Gallons 1 @ 5 MG unlined 13 units	
Electrical System Utility Voltage Switchgear Distribution Generator Mounted Lighting	 480 V 480 V 480 V 1 @ 250 kW 335 Bhp 19 units	
Utility Water System Pipelines Valves	 < 2 in. diameter 1 units	
Potable Water System Backflow Devices Valves	 1 units 3 units	
Instrumentation and Control System HMI Workstation PLC I/O Hub Radio Transmitter	 1 units 1 units 1 units 1 units	
Chemical Injection Chemical Pumps Storage Tank	 2 units 1 @ 13,000 Gallons	Diaphragm

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Pump System	4	4	4	4
Force Mains	4	4	4	4
Electrical System	3	3	3	3
Utility Water System	3	3	3	3
Potable Water System	3	3	3	3
Instrumentation and Control System	3	3	3	3
Chemical Injection	4	4	4	4

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

Pump System
Pumps are old and noisy. Requesting for non-clog pump similar to ones at Montclair Lift Station.

Pump #2 every few years the motor bearings have issues and requires to replacement.

Force Mains
The condition of the 12-inch and 18-inch force mains has not been inspected for the entire length of pipe. Both force mains are approaching 50 years in age and approaching the end of its service life. Project EN23002 will address the force main issues, as well as provide inspection manholes for future condition assessment.

Electrical System
No issues require special attention.

Utility Water System
No issues require special attention.

Instrumentation and Control System
No issues require special attention.

Chemical Injection
Issues with insufficient discharge pressure from chemical injection pump. Line pressure is 60+ psi but discharge pressure from chemical injection pump can drop to 50 psi.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Pump System	1968	2013
Electrical System	1968 2007	
Utility Water System	2011	
Potable Water System	1968	
Instrumentation and Control System	2007	
Chemical Injection	1993	

* Appendix B – Condition Assessment Reports

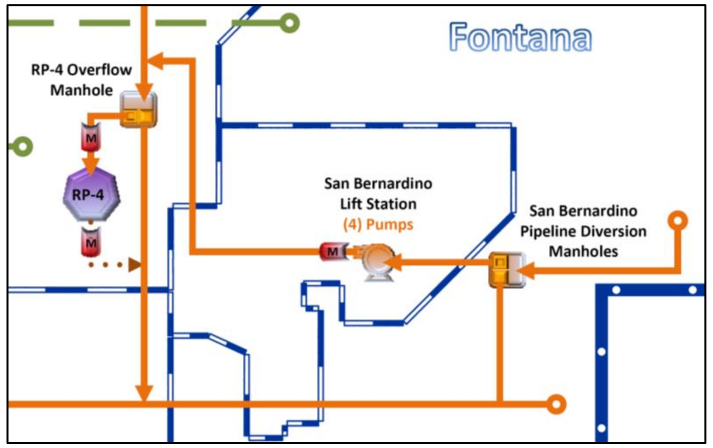
Table 4 Potential Projects

System	Project Name	Project Description
Chemical Injection	Philadelphia Lift Station Ferric Injection Enhancement	Replace the existing ferric tank (1993) and the ferric pumps. Line pressure is 60+ psi but discharge pressure from chemical injection pump can drop to 50 psi.

Asset Management System Summary – LS

San Bernardino Avenue Lift Station

1. Asset Profile



Pump System
The San Bernardino Avenue lift station conveys flows from the Fontana area to Regional Plant No. 4. The flows are lifted about 60 feet through about 1.4 miles of force main. To maintain acceptable flow velocities, two force mains of different diameters were provided. Four vertical-turbine pumps are provided with provisions for a future pump to be added to the wet well.

Electrical System
The electrical energy to power the lift station is obtained from the local electrical grid (SCE) and from onsite energy generation (emergency generator). The electrical feed from the grid is composed of a 12 kV feeder to a transformer and switchgear to distribute electrical energy throughout the facility. A single line diagram of the electrical system is shown in Appendix B.

A diesel emergency generator is used in a power failure. The generator is located adjacent to the electrical room for the lift station.

Potable Water System
Potable water is supplied to the site to be used as seal water for the lift pumps. The water is supplied to a storage tank by an air gap, and the tank in turn supplies the seal-water pump system.

Instrumentation and Control System
The lift station includes enough instrumentation and a PLC to allow for full control of the lift station remotely. The PLC and I/O include full redundancy for added reliability.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
San Bernardino Lift Station	7 MGD	
Pump System		
Pipelines	30-inch 5,902 gpm 24-inch 13,890 gpm	
Pump Station	2 @ 3,300 gpm 50 hp 2 @ 6,945 gpm 125 hp	
Valves	7 units	
Seal Water Tank	1 @ 2,900 Gal. 1 @ 50 Gal.	Secondary Primary
Seal Water Pumps	2 Ea.	
Electrical System		
Utility Voltage	12 kV	
Transformers	12 kV to 480 V	
Switchgear	480 V	
Distribution	480 V	
Generator	1 @ 500 kW 757 Bhp	
Mounted Lighting	19 units	
Potable Water System		
Backflow Devices	1 units	
Valves	2 units	
Instrumentation and Control System		
HMI Workstation	1 Ea.	
RTU	2 Ea.	
PLC	2 Ea.	
I/O Hub	2 Ea.	

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Pump System	4	3	4	4
Electrical System	3	3	3	3
Potable Water System	3	3	3	3
Instrumentation and Control System	3	3	3	3

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

Pump System
OPS is experiencing persistent ragging issues. EN 23036 would eventually address this issue by replacing all 4 non-clog vertical turbine to chopper pumps. However, OPS is seeking an immediate and short term fix by replacing at least one of the four pumps to Chopper.

Electrical System
Currently no issues require special attention.

Potable Water System
Currently no issues require special attention.

Instrumentation and Control System
Currently no issues require special attention.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Pump System	2007	
Electrical System	2007	
Potable Water System	2007 2013	
Instrumentation and Control System	2007 2012	

* Appendix B – Condition Assessment Reports

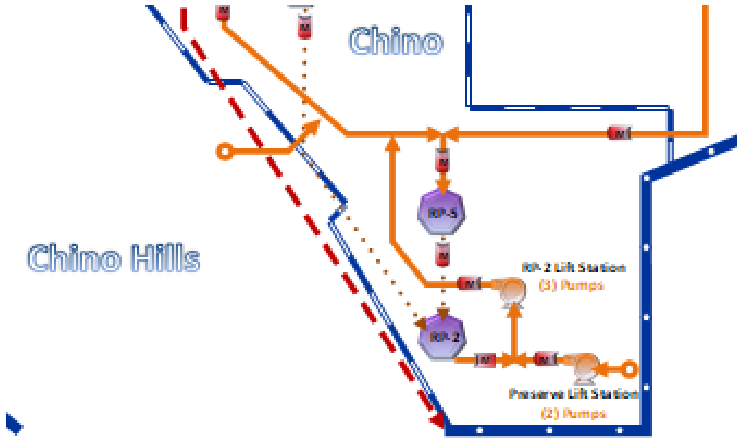
Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – LS

Regional Plant No.2 (RP-2) Lift Station

1. Asset Profile



Pump System
The RP-2 lift station collects raw sewage from the Mountain Avenue interceptor, CIW sewer, Butterfield force main, and the recycle flows from the solids treatment facilities at RP-2, and discharges through a 24-inch pipeline to the RP-5 headworks. The lift station is located on the RP-2 treatment plant site.

Electrical System
The electrical energy to power the lift station is fed from the RP-2 treatment plant distribution system. A separate backup generator for the lift station has been provided if utility power or the RP-2 distribution systems fail.

Instrumentation and Control System
The lift station includes instrumentation and automation to allow full remote control of the facility.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
RP-2 Lift Station	9.5 MGD	
Pump System Pipelines Pump Station Valves	 24-inch 6,600 gpm 3 @ 3,300 gpm 100 hp 6 units	
Electrical System Utility Voltage Transformers Switchgear Distribution Generator Mounted Lighting	 12 kV 12 kV to 480 V 480 V 480 V 1 @ 300 kW 443 Bhp > 2 units	
Instrumentation and Control System HMI Workstation RTU PLC I/O Hub	 1 Ea. 1 Ea. 1 Ea. 1 Ea.	

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Pump System	3	3	3	3
Electrical System	3	3	3	3
Instrumentation and Control System	3	3	3	3

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

Pump System
Due to the location and elevation of the RP-2 Lift Station, it will need to be relocated when the RP-5 Solids Treatment Facility is constructed to replace the RP-2 Solids Treatment Facility. The new lift station will be addressed by project EN19006.

Electrical System
Currently no issues require special attention.

Instrumentation and Control System
Currently no issues require investigation.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Pump System	2000	
Electrical System	2000	
Instrumentation and Control System	2000	

* Appendix B – Condition Assessment Reports

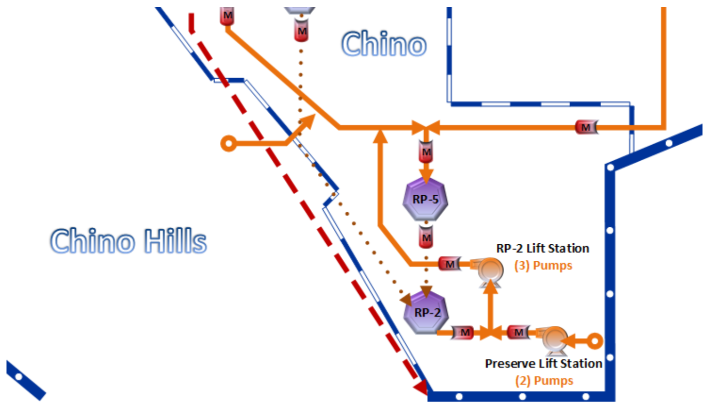
Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – LS

Preserve Lift Station

1. Asset Profile



Pump System

The Preserve Lift Stations handles flows from the Preserve residential and commercial development as well as the discharge flows from the California Institution for Women (CIW). This pump station is designed to pump raw unscreened wastewater to the existing Chino Interceptor Sewer at Kimball Ave. and Mill Creek Avenue. The pump station has two different sized parallel force mains a 16-inch and an 18-inch force main. This pump station is owned by the City of Chino but operated by IEUA.

The pump station is operated at constant speed in a fill and draw mode based on the water levels in the wet well. When the water reaches a certain level, a single pump will start and draw the water level down to the pump shut-off level. If the water level continues to rise with one pump operating, a second pump will start up.

Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Preserve Lift Station	1 MGD	
Pump System Pipelines Pump Station	 16-inch 2 @ 1890 gpm 85 hp	
Electrical System Utility Voltage Transformers Distribution	 12 kV 12 kV to 480 V 480 V	
Instrumentation and Control System Control Panel	 1 Ea.	

2. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Pump System	2	2	2	2
Electrical System	2	2	2	2
Instrumentation and Control System	2	2	2	2

* Ratings as defined in Appendix A; General System Assets

3. Key Issues for Further Investigation

Pump System

Current system has issues with properly removing the rags and debris build up in the wet well. There is a project to install a chopper pump in pump location no. 1 which will be used as part of a cleaning cycle to draw down the wet well and remove most of the rags and debris from the wet well.

Electrical System

Currently no issues require special attention.

Instrumentation and Control System

The control system allows for only local control and has no alarm capabilities. A cleaning cycle will need to be programmed once the new chopper pump is installed in pump no.1's location.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Pump System	2017	
Electrical System	2017	
Instrumentation and Control System	2017	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

End of System Summary

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Asset Management System Summary – Regional Sewer System

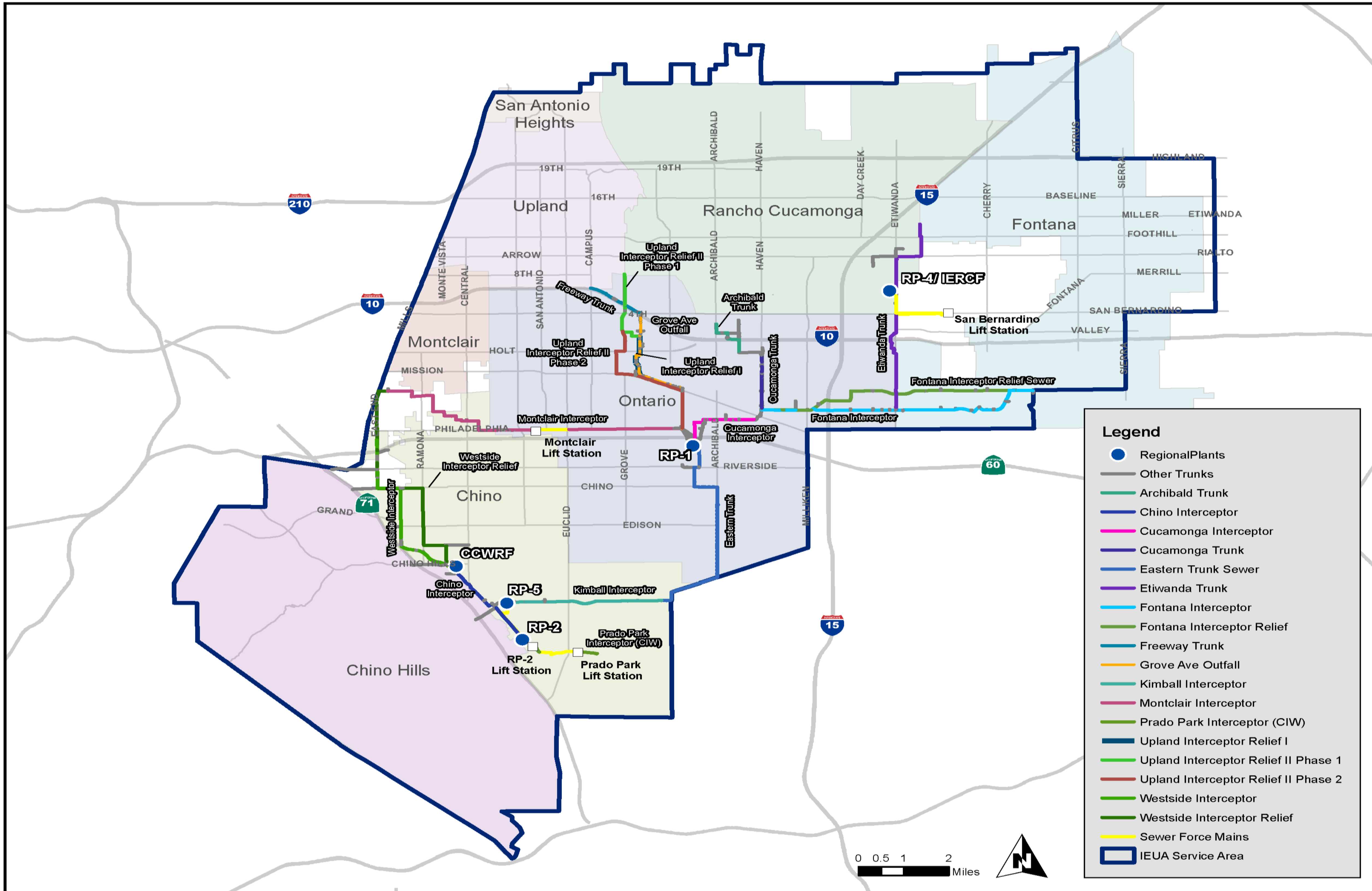

Figure 7-11: Regional Sewer System (RS) – Schematic

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Table 7-10: Regional Sewer System – Project Summary

#	Project Number[1]	Project Name	Project Description	Fund[2]	Project Type[3]	Fiscal Year Budget (Dollars)										
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Ten-Year Total
1	EN19024	Collection System Asset Management - Assessment Only (Joel Ignacio)	Solicit for qualified firms to provide the consulting services to meet the goal of the AM program and seek contractors to implement condition assessment activities or needed repairs or rehab. The activities will be specific to the Collection System (Regional Conveyance System).	RO	OM	60,000	0	0	0	0	0	0	0	0	0	60,000
2	EN23015	Collection System Upgrades 22/23 (Josh Biesiada)		RC	RP	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	5,000,000
3	EN26021	Regional Conveyance AMP (Ken Monfore)		RO	CC	0	0	0	500,000	0	0	0	0	0	0	500,000
4	EN21058	Regional Sewer-Hydraulic Modeling (Matthew Poeske)	This project will allow up to four to five analysis per year, along with IEUA labor costs, to be run for regional connection analysis.	RO	OM	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	400,000
5	EN18021	Prado Basin AMP Annual Monitoring (Joshua Aguilar)		NC	OM	110,000	112,500	115,000	117,500	120,000	122,500	125,000	127,500	50,000	50,000	1,050,000
6	EN22037	Prado De-Chlor (Julianne Frabizio)	Engineering will need to investigate whether it is more cost effective to protect in place the Prado De-Chlorination chemical storage facility, metering building, and the injection& monitoring buildings or to relocate them above 566' of elevation. Once a decision is made on protecting in place or relocating, Engineering will then need to move forward with design and construction	RO	OM	303,000	0	0	0	0	0	0	0	0	0	303,000
7	FM23003	Prado Dechlorination Station Reroofing (Frank Sotomayor)		GG	OM	120,000										120,000

(1) Project Number – from Ten-Year Capital Improvement Project; Final Capital Project List 03-17-2014

(2) Project Fund – Administrative Services (GG), Non-Reclaimed Water (NC), Regional Composting Authority (RM), Ground Water Recharge (RW), Recycled Water (WC), Regional Capital (RC), Regional O&M (RO), or Water Fund (WW)

(3) Project Type – Capital Construction Project (CC), Capital Major Equipment Project (EQ), Operations & Maintenance Project (OM), Reimbursable Project (RE), or Capital Replacement Project (RP)

Asset Management System Summary – RS

Northern Regional Sewer System

1. Asset Profile

The Agency's regional wastewater treatment provides domestic and industrial disposal systems across a 242-square-mile service area to eight contracting agencies. These contracting agencies include the City of Chino, Chino Hills, Cucamonga Valley Water District, Fontana, Montclair, Ontario, Upland, and Monte Vista Water District.

The Regional Sewer System (RSS) conveys primarily domestic wastewater to IEUA's four regional water recycling facilities. The RSS has been separated into two systems and will be referred to in the system summary sheets as the Northern Regional Sewer System and Southern Regional Sewer System. The operation and maintenance of the RSS systems are the responsibility of the IEUA's Pretreatment and Source Control (PT&SC) Department's Collections System Group.

Northern Regional Sewer System

The Northern Regional Sewer System consists of sewer pipelines north of the 60 freeway terminating into RP-1.

Gravity Sewer System:

- Archibald Trunk – 18,776 LF of pipeline from Archibald Ave. and Inland Empire Blvd. to Haven Ave. and Francis St, consisting of 742 LF of 54-inch piping, 2,549 LF of 36-inch piping, 5,000 LF of 30-inch piping, 1,707 LF of 24-inch piping, 917 LF of 20-inch piping, and 7,860 LF of 18-inch piping.
- Cucamonga Interceptor Relief – 10,043 LF of RCP pipeline from Haven Ave. to RP-1 on Cedar Ave, consisting of 786 LF of 81-inch piping, 7,203 LF of 72-inch piping, 843 LF of 60-inch piping, and 1,210 LF of 54-inch piping.
- Cucamonga Interceptor – 11,382 LF of RCP pipeline from Haven Ave. to RP-1 on Cedar Ave, consisting of 208 LF of 84-inch piping, 1,310 LF of 72-inch piping, 8,255 LF of 42-inch piping, and 1,609 LF of 27-inch piping.
- Cucamonga Trunk Relief - 12,398 LF of RCP pipeline from 10 Fwy. to Francis St. on Hermosa Ave and Haven Ave.
- Etiwanda Trunk – 29,542 LF of VCP pipeline from Eastend Ave. to Jurupa Ave. on Etiwanda Ave, consisting of 3,596 LF of 42-inch piping, 4,882 LF of 36-inch piping, 2,056 LF of 30-inch piping, 3,049 LF of 27-inch piping, 12,157 LF of 24-inch piping, 1,761 LF of 21-inch piping, 968 LF of 15-inch piping, and 2042 LF of 12-inch piping.
- Fontana Interceptor – 40,691 LF: 33,128 LF of pipeline from Live Oak Ave. to Haven Ave. on Marlay St. and Francis St., consisting of 5,396 LF of 39-inch piping, 7,657 LF of 36-inch piping, 13,138 LF of 33-inch piping, 4,915 LF of 21-inch piping, and 393 LF of 18-inch piping.
- Fontana Interceptor Relief – 36,119 LF of pipeline from Beech Ave. to Milliken Ave on Jurupa Ave, consisting of 5,187 LF of 78-inch piping, 508 LF of 72-inch piping, 12,105 LF of 66-inch piping, 3,925 LF of 54-inch piping, 1,804 LF of 48-inch piping, 977 LF of 42-inch piping, 260 LF of 36-inch piping, 5,595 LF of 30-inch piping, 2,415 LF of 27-inch piping, 260 LF of 24-inch piping, and 3,080 LF of 21-inch piping.
- Freeway Trunk – 6,076 LF of VCP pipeline along 10 Fwy. from 6th St. to 4th St., consisting of 74 LF of 39-inch piping, 208 LF of 33-inch piping, 2,219 LF of 27-inch piping, 3,169 LF of 18-inch piping, 166 LF of 15-inch piping, and 166 LF of 12-inch piping.
- Grove Avenue Outfall – 22,888 LF of VCP piping from Grove Ave. and 8th St. to Cucamonga Ave. and Mission Ave. to Carlos Ave., consisting of 270 LF of 42-inch piping, 8,917 LF of 36-inch piping, 8,060 LF of 30-inch piping, 1,395 LF of 27-inch piping, 236 LF of 24-inch, 689 LF of 21-inch, and 3,318 LF of 18-inch piping.
- Grove Interceptor – 4,042 LF: 3,964 LF of VCP pipeline from 8th St. to 5th St. on Grove Ave, consisting of 465 LF of 36-inch piping and 3,508 LF of 30-inch piping.
- Montclair Interceptor – 41,197 LF: 37,432 LF of VCP pipeline from Roswell Ave. and Grand Ave. to RP-1 on Philadelphia St., consisting of 720 LF of 67-inch piping, 1,510 LF of 60-inch piping, 31,349 LF of 30-inch piping, 494 LF of 27-inch, 392 LF of 24-inch, 2,658 LF of 21-inch and 308 LF of 12-inch piping.
- Turner Trunk – 2,562 LF of 24-inch VCP pipeline from 4th St. to 10 Fwy. on Turner St.
- Upland Interceptor – 10,870 LF of 30-inch VCP pipeline from Imperial Ave. and Mission Ave. to Carlos Ave. and Philadelphia Ave.
- Upland Interceptor Relief – 19,623 LF of VCP pipeline from 4th St. to Mission Ave. on Imperial St, consisting of 2,525 Lf of 36-inch piping, 2,325 LF of 30-inch, 1,205 LF of 27-inch, 749 LF of 24-inch, 7,422 LF of 21-inch, 3,295 LF of 18-inch, and 2,044 LF of 15-inch piping.

Force Main System:

- Montclair Lift Force Main – 4,366 LF of ductile iron pipeline from Montclair Lift Station to Euclid Ave.
- San Bernardino Lift Force Main

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Archibald Trunk	54-inch – 62 MGD 36-inch – 18.1 MGD 30-inch – 21.5 MGD 24-inch – 11.9 MGD 20-inch – 8.3 MGD 18-inch – 7.4 MGD	3.1 ft/s 2.9 ft/s 2.0 ft/s 2.3 ft/s 6.0 ft/s 6.0 ft/s
Cucamonga Interceptor Relief	81-inch – 254 MGD 72-inch – 105 MGD 60-inch – 214 MGD 54-inch – 71.8 MGD	6.2 ft/s 4.0 ft/s 6.0 ft/s 5.6 ft/s
Cucamonga Interceptor	84-inch – 238 MGD 72-inch – 158 MGD 42-inch – 21.2 MGD 27-inch – 15.3 MGD	6.0 ft/s 5.6 ft/s 2.0 ft/s 6.0 ft/s
Cucamonga Trunk Relief	39-inch – 29.5 MGD 36-inch – 34.6 MGD 33-inch – 34.0 MGD 30-inch – 29.9 MGD 27-inch – 30.4 MGD 24-inch – 23.4 MGD	4.4 ft/s 5.8 ft/s 6.0 ft/s 5.6 ft/s 6.0 ft/s 5.2 ft/s
Etiwanda Trunk	42-inch – 41 MGD 36-inch – 45 MGD 30-inch – 28 MGD 27-inch – 14 MGD 24-inch – 18 MGD 21-inch – 14 MGD 18-inch – 6 MGD	3.0 ft/s 7.0 ft/s 5.0 ft/s 5.0 ft/s 7.0 ft/s 6.0 ft/s 6.0 ft/s
Fontana Interceptor	39-inch – 15.9 MGD 36-inch – 19.4 MGD 33-inch – 11.1 MGD 21-inch – 10.8 MGD 18-inch – 12.7 MGD	1.7 ft/s 2.1 ft/s
Fontana Interceptor Relief	78-inch – 98.4 MGD 72-inch – 79.8 MGD 66-inch – 83.5 MGD 54-inch – 67.4 MGD 48-inch – 79.5 MGD 42-inch – 18.6 MGD 36-inch – 17.6 MGD 30-inch – 18.3 MGD 27-inch – 23.2 MGD 21-inch – 12.3 MGD	
Freeway Trunk	39-inch – 20.6 MGD 33-inch – 18.4 MGD 27-inch – 23.6 MGD 18-inch – 8.0 MGD 15-inch – 14.7 MGD 12-inch – 8 MGD	
Grove Avenue Outfall	42-inch – 21 MGD 36-inch – 34 MGD 30-inch – 31.8 MGD 27-inch – 29 MGD 24-inch – 23.6 MGD 21-inch – 9.7 MGD 18-inch – 10.4 MGD	
Grove Interceptor	36-inch – 36.9 MGD 30-inch – 42.1 MGD	
Montclair Interceptor	67-inch – 149 MGD 60-inch – 58 MGD 30-inch – 7 MGD 27-inch – 6.7 MGD 24-inch – 9 MGD 21-inch – 8.5 MGD	5.8 ft/s 3.6 ft/s 1.2 ft/s 1.2 ft/s 2.0 ft/s 2.5 ft/s
Turner Trunk	24-inch – 16 MGD	6 ft/s
Upland Interceptor	30-inch – 25.9 MGD	5.5 ft/s
Upland Interceptor Relief	36-inch – 31.6 MGD 30-inch – 31.5 MGD 27-inch – 16.1 MGD 24-inch – 13.1 MGD 21-inch – 15.9 MGD 18-inch – 7.4 MGD 15-inch – 5.2 MGD	5.4 ft/s 7.8 ft/s 5.9 ft/s 5.7 ft/s 7.0 ft/s 3.6 ft/s 4.3 ft/s
Montclair Lift Force Main	18-inch	
San Bernardino Lift Force Main		

3. Asset Ratings

Table 2 Asset Ratings - Pipeline Segments (PS) Manhole (MH)

System		Total Assets (GIS)	Rating Scale* 1 = Excellent; 5 = Failing				
			1	2	3	4	5
Archibald Trunk	PS			x	x		
	MH		x				x
Cucamonga Int. Relief	PS						
	MH		x				x
Cucamonga Interceptor	PS						
	MH		x	x		x	x
Cucamonga Relief	PS						
	MH						
Etiwanda Trunk	PS		x				
	MH		x	x			
Fontana Interceptor	PS		x	x	x		
	MH		x	x	x	x	
Fontana Int. Relief	PS						
	MH		x	x	x	x	
Freeway Trunk	PS						
	MH		x	x	x	x	
Grove Avenue Outfall	PS		x	x	x	x	
	MH		x	x	x	x	
Montclair Interceptor	PS		x	x			
	MH		x			x	x
Turner Trunk	PS						
	MH		x				
Upland Interceptor	PS		x				
	MH		x				
Upland Int. Relief	PS		x				
	MH		x		x		
Montclair Lift Force Main	PS						
	MH						
San Bern. Lift Force Main	PS						
	MH						

* Ratings as defined in Appendix A; Collection Systems Assets

4. Asset History & Potential Projects

Table 4 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report*
Archibald Trunk	1963	
Cucamonga Interceptor	1973	
Cucamonga Inter. Relief	1987	
Cucamonga Trunk Relief	1983	
Etiwanda Trunk	1986	
Fontana Interceptor		
Fontana Interceptor Relief		
Freeway Trunk	1961	
Grove Avenue Outfall	1961, 2006, 2010	
Grove Interceptor	1961, 2006	
Montclair Interceptor	1975	
Turner Trunk	1969	
Upland Interceptor	1956	
Upland Interceptor Relief	1956, 1991	
Montclair Lift Force Main	1978	
San Bern. Lift Force Main		

* Refer to GIS Database – Condition Assessment Reports

Table 5 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – RC

Southern Regional Sewer System

1. Asset Profile

The Agency's regional wastewater treatment provides domestic and industrial disposal systems across a 242-square-mile service area to eight contracting agencies. These contracting agencies include the City of Chino, Chino Hills, Cucamonga Valley Water District, Fontana, Montclair, Ontario, Upland, and Monte Vista Water District.

The Regional Sewer System (RSS) conveys primarily domestic wastewater to IEUA's four regional water recycling facilities. The RSS has been separated into two systems and will be referred to in the system summary sheets as the Northern Regional Sewer System and Southern Regional Sewer System. The operation and maintenance of the RSS systems are the responsibility of the IEUA's Pretreatment and Source Control (PT&SC) Department's Collections System Group.

Southern Regional Sewer System

The Southern Regional Sewer System consists of sewer pipelines south of the 60 freeway and RP-1.

Gravity Sewer System:

- Chino Interceptor – 16,059 LF of pipeline from CCWRF to RP-5 and RP-2, consisting of 150 LF of 54-inch piping, 1,933 LF of 42-inch piping, 6,212 LF of 30-inch piping, 1,645 LF of 27-inch piping, and 6,118 LF of 24 piping.
- Eastern Trunk Sewer – 29,321 LF of pipeline from RP-1 connecting to the Kimball Interceptor at Hellman Ave., consisting of 41 LF of 81-inch piping, 30 LF of 67-inch piping, 4,964 LF of 48-inch piping, 10,766 LF of 42-inch piping, 2,246 LF of 39-inch piping, 6,387 LF of 36-inch piping, 4,783 LF of 33-inch piping, and 100 LF of 27-inch piping.
- Kimball Interceptor – 18,923 LF of pipeline from RP-5 east to Hellman Ave., consisting of 2,137 LF of 66-inch piping, 4,809 LF of 60-inch piping, 10,889 of 54-inch piping, and 1,087 LF of 48" piping.
- Los Serranos Trunk – 2,807 LF of pipeline from Pomona Rincon Rd. to El Prado Rd. There are 52 LF of 36" piping and 2,755 LF of 30" piping.
- Westside Interceptor – 23,806 LF of pipeline from Walnut Ave. and Eastend Ave. to Chino Ave. along Pipeline and ending in CCWRF, consisting of 1,297 LF of 24" piping, 10,473 LF of 21" piping, 7,391 LF of 18" piping, 2,719 LF of 15" piping, 1358 LF of 12" piping, and 565 LF of 10" piping.
- Westside Interceptor Relief Sewer – 40,715 LF of pipeline from Montclair diversion structure along Eastend Ave. to Chino Ave, Ramona Ave., Eucalyptus Ave., and Monte Vista Ave. to CCWRF, consisting of 2,575 LF of 54" piping, 4,948 LF of 42" piping, 1,623 LF of 36" piping, 8,803 LF of 33" piping, 1,358 LF of 30" piping, 18,300 of 27" piping, 866 LF of 24" piping, 1,773 LF of 21" piping, and 445 LF of 15" piping.
- Preserve Lift Station Force Main
- RP-2 Lift Station Force Main

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Chino Interceptor	54" – 67.0 MGD 42" – 21.0 MGD 30" – 13.0 MGD 27" – 14.3 MGD 24" – 12.0 MGD	6.0 ft/s 1.8 ft/s 2.3 ft/s 3.3 ft/s 4.0 ft/s
Eastern Trunk Sewer	81" – 194 MGD 67" – X MGD 48" – 47 MGD 42" – 60.3 MGD 39" – 18.4 MGD 36" – 61.7 MGD 33" – 28.8 MGD 27" – 78.4 MGD	6.0 ft/s 6.3 ft/s 6.0 ft/s 6.0 ft/s 6.0 ft/s 6.0 ft/s 6.0 ft/s 6.0 ft/s
Kimball Interceptor	66" – 70.5 MGD 60" – 83.8 MGD 54" – 52.1 MGD 48" – 39.7 MGD	4.7 ft/s 6.3 ft/s 5.2 ft/s 5.6 ft/s
Los Serranos Trunk	36" – 17.9 MGD 30" – 28 MGD	
Westside Interceptor	24" – 7.2 MGD 21" – 7.7 MGD 18" – 5.8 MGD 15" – 4.9 MGD 12" – 1.8 MGD 10" – 2.0 MGD	2.3 ft/s 3.1 ft/s 3.8 ft/s
Westside Interceptor Relief Sewer	54" – 31.9 MGD 42" – 21.7 MGD 36" – 26.6 MGD 33" – 30.2 MGD 30" – 13.6 MGD 27" – 21.0 MGD 24" – 28.2 MGD 21" – 31.6 MGD	2.3 ft/s 2.4 ft/s 3.2 ft/s 4.8 ft/s 2.0 ft/s 3.5 ft/s 6.2 ft/s 2.2 ft/s
Preserve Lift Station Force Main		
RP-2 Lift Station Force Main		

3. Asset Ratings *(to be developed in future updates)*

Table 2 Asset Ratings - Pipeline Segments (PS) Manhole (MH)

System	Total Assets (GIS)		Rating Scale* 1 = Excellent; 5 = Failing				
			1	2	3	4	5
Chino Interceptor	PS		x	x	x		
	MH		x	x		x	x
Eastern Trunk Sewer	PS		x				
	MH						
Kimball Interceptor	PS		x				
	MH		x	x	x	x	
Los Serranos Trunk	PS		x	x			
	MH		x			x	x
Westside Interceptor	PS						
	MH						
Westside Inter. Relief Sewer	PS		x	x		x	
	MH		x		x	x	x
Preserve Lift Station Force Main	PS						
	MH						
RP-2 Lift Station Force Main	PS						
	MH						

* Ratings as defined in Appendix A; Collection Systems Assets

4. Asset History & Potential Projects

Table 4 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report*
Chino Interceptor		
Eastern Trunk Sewer		
Kimball Interceptor	1999	
Los Serranos Trunk		
Westside Interceptor		
Westside Interceptor Relief Sewer		
CIW/Prado Park Lift	1964, 1976, 1991, 1998, 2010	
RP-2 Lift Station Force Main		

* Refer to GIS Database – Condition Assessment Reports

Table 5 Potential Projects

System	Project Name	Project Description
NA	NA	NA

End of System Summary

Asset Management System Summary – Non Reclaimable Wastewater System

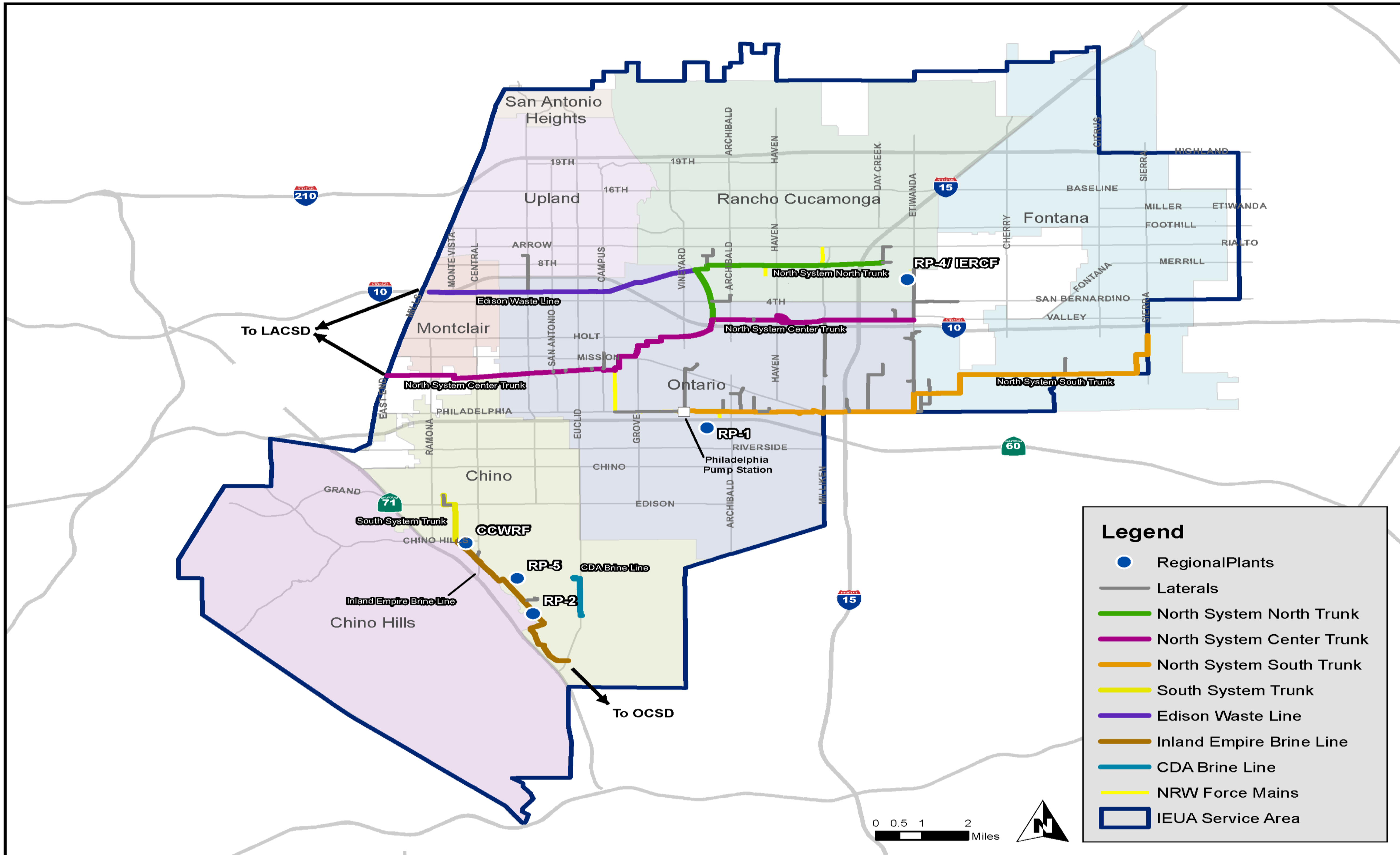

Figure 7-12: Non-Reclaimable Wastewater System (NRW) – Schematic

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Table 7-11: Non-Reclaimable Wastewater System – Project Summary

#	Project Number[1]	Project Name	Project Description	Fund[2]	Project Type[3]	Fiscal Year Budget (Dollars)										
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Ten-Year Total
1	EN23077	NRW Assessment Projects (Ken Monfore)		NC	OM	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	500,000
2	EN22007	NRW Asset Management Projects (Ken Monfore)	Solicit for qualified firms to provide the consulting services to meet the goal of the AM program and seek contractors to implement condition assessment activities or needed repairs or rehab. The activities will be specific to the NRW Collection System	NC	CC	0	200,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	4,200,000
3	EN19028	NRW Man Hole and Pipeline Condition Assessment (Joel Ignacio)	Solicit for qualified firms to provide the consulting services to meet the goal of the AM program and seek contractors to implement condition assessment activities or needed repairs or rehab.The activities will be specific to the NRW's Man Hole and Pipeline System.	NC	OM	70,000	0	0	0	0	0	0	0	0	0	70,000
4	EN23016	NRWS Emergency O&M Projects FY 22/23 (Rachael Solis)		NC	OM	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	1,000,000
5	EN23014	NRWS Manhole Upgrades - 22/23 (Josh Biesiada)		NC	RP	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	180,000	1,800,000
6	EN23075	NRWS On Call O&M Projects FY22/23 (Rachael Solis)		NC	OM	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	1,000,000
7	EN23086	New NRW Projects PDR's FY 22/23 (Jason Marseilles)		NC	CC	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	1,000,000

#	Project Number[1]	Project Name	Project Description	Fund[2]	Project Type[3]	Fiscal Year Budget (Dollars)										
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Ten-Year Total

(1) Project Number – from Ten-Year Capital Improvement Project; Final Capital Project List 03-17-2014

(2) Project Fund – Administrative Services (GG), Non-Reclaimed Water (NC), Regional Composting Authority (RM), Ground Water Recharge (RW), Recycled Water (WC), Regional Capital (RC), Regional O&M (RO), or Water Fund (WW)

(3) Project Type – Capital Construction Project (CC), Capital Major Equipment Project (EQ), Operations & Maintenance Project (OM), Reimbursable Project (RE), or Capital Replacement Project (RP)

Asset Management System Summary –
Non-Reclaimable Wastewater System

1. Asset Profile

The Agency operates the Non-Reclaimable Wastewater System (NRWS), which provides the disposal means for discharges of high-salt-content industrial wastewater. This wastewater is not suitable to be treated at the Agency's treatment plants. The NRWS transports non-reclaimable, salt-laden, industrial wastewater out of the Agency's service area to other treatment facilities in Los Angeles and Orange counties and to eventual discharge to the Pacific Ocean.

Northern Non-Reclaimable Waste System

- The North NRWS consists of five major trunk lines: the North, Central, and South trunk lines, the Edison Waste Line, and the Cucamonga Creek Trunk. The trunk lines collect industrial waste and convey the combined discharge to the County sanitation districts of Los Angeles County's sewer system.
- North System North Trunk – 22,887 LF of VCP pipeline in Rancho Cucamonga from Day Creek St. and Arrow St. along 8th St. to Hellman Ave.
- North System Center Trunk – 71,343 LF of VCP pipeline starting on Etiwanda Ave. and RP-4 in the City of Ontario running south to Ontario Mills Pkwy., west to Hellman Ave., southwest to Phillips Ave., and west to LACSD.
- North System South Trunk – 65,720 LF of VCP pipeline from Sierra Ave. and Slover Ave. in the City of Fontana to Jurupa Ave., west to Mulberry Ave, south on to Francis St., south on to Etiwanda Ave., and west to Philadelphia Ave to the Philadelphia pump station, where it is connected to the North System Center Trunk by the Philadelphia lift station force main.
- Edison Waste Line – 33,757 LF VCP of pipeline starting from Helms Ave. and 9th St. in Rancho Cucamonga, running south on Hellman Ave., and turning southwest to 5th Ave. in the City of Ontario, and running west along 5th St. to LACSD pipelines.
- Cucamonga Creek Trunk – 8,659 LF VCP of pipeline connecting the Edison Waste Line to the North System Center Trunk along Hellman Ave.
- Philadelphia Lift Force Main – 26,452 LF of two parallel force mains 12-inch and 18-inch VCP pipeline from the Philadelphia Pump Station west on Philadelphia Ave. and north on Bon View Ave. to the North System Center Trunk.

Southern Non-Reclaimable Waste System

The South NRWS serves industries in the south service area of the Agency, and the combined discharge is conveyed to Inland Empire Brine Line (IEBL) and ultimately to the sewer system of the Orange County Sanitation District.

Inland Empire Brine Line – 25,948 LF VCP and RCP of pipeline from Yorba Ave. and Edison Ave. to Monte Vista Ave., with a connection at CCWRF along Chino Creek to El Prado Rd. at Kimball Ave., extending southeast to Euclid Ave. and ultimately to OCSD. There are 15-inch VCP pipelines on Edison Ave., 15-inch VCP on Yorba Ave., 12-inch VCP on Monte Vista St., 27-inch RCP Central Ave/Easement, and 27-inch RCP along El Prado Rd.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	
North System North Trunk		
North System Center Trunk		
North System South Trunk	24-inch VCP 8-inch VCP	
Edison Waste Line		
Cucamonga Creek Trunk		
Philadelphia Lift Force Main	18-inch 12-inch	
Inland Empire Brine Line		

3. Asset Ratings

Table 2 Asset Ratings – Pipeline Segments (PS) Manhole (MH)

System	Total Assets (GIS)		Rating Scale* 1 = Excellent; 5 = Failing				
			1	2	3	4	5
North System North Trunk	PS						
	MH						
North System Center Trunk	PS						
	MH						
North System South Trunk	PS						
	MH						
Edison Waste Line	PS						
	MH						
Cucamonga Creek Trunk	PS						
	MH						
Philadelphia Lift Force Main	PS						
	MH						
Inland Empire Brine Line	PS						
	MH						

* Ratings as defined in Appendix A; Collection Systems Assets

4. Asset History & Potential Projects

Inland Empire Brine Line

According to the 2006 PBS&J condition assessment report of the IEBL line, 1/3 of the entire pipeline required rehabilitation/replacement, and 1/3 required re-inspection because of inaccessibility. The segments recommended for attention require considerable cleaning to remove debris, which has accumulated within the pipes and may contain hazardous constituents. Inspections were severely hampered by the debris accumulation. Additional inspection for many of the segments is recommended after the cleaning is complete.

Several manholes were found to be surcharged, while the manholes located at the southern-most end of the trunk sewer were inaccessible because of pressure lids.

Table 4 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report*
North System North Trunk		2006
North System Center Trunk		2006
North System South Trunk		2006
Edison Waste Line		2006
Cucamonga Creek Trunk		2006
Philadelphia Lift Force Main		2006
Inland Empire Brine Line		2006

*Refer to GIS Database – Condition Assessment Reports

Table 5 Potential Projects

System	Project Name	Project Description
NA	NA	NA

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Asset Management System Summary – Agency Laboratory

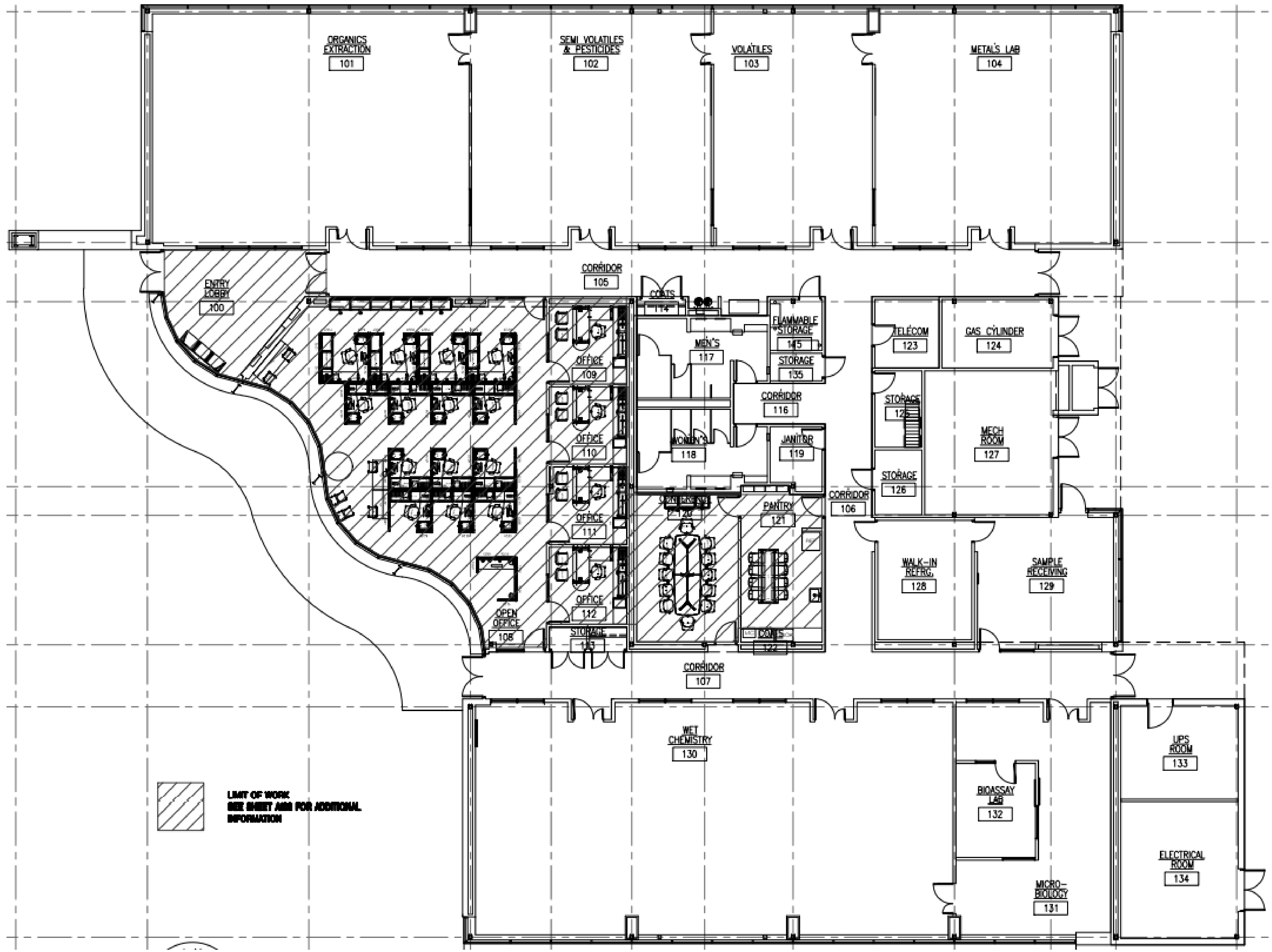

Figure 7-13: Agency Laboratory (Lab) – Schematic

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Table 7-12: Agency Laboratory – Project Summary

#	Project Number[1]	Project Name	Project Description	Fund[2]	Project Type[3]	Fiscal Year Budget (Dollars)										
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Ten-Year Total
1	EN23039	Lab Rooms Temperature Variation (Jamal Zughbi)	The project's scope includes the evaluation of the existing HVAC system capabilities and verify if the original design Lab room temperature of 72F can be brought down to 68F at all times. A consulting engineering firm will be retained to perform the desired system evaluation and produce a predesign report summarizing the findings and highlighting any potential Central Plant and/or HVAC equipment upgrade and improvement.	GG	CC	240,000	-	-	-	-	-	-	-	-	-	***240,000***
2	LB23001	Oil and Grease Extractor (Kawal Padda)		GG	CC	100,000										***100,000***

(1) Project Number – from Ten-Year Capital Improvement Project; Final Capital Project List 03-17-2014
(2) Project Fund – Administrative Services (GG), Non-Reclaimed Water (NC), Regional Composting Authority (RM), Ground Water Recharge (RW), Recycled Water (WC), Regional Capital (RC), Regional O&M (RO), or Water Fund (WW)
(3) Project Type – Capital Construction Project (CC), Capital Major Equipment Project (EQ), Operations & Maintenance Project (OM), Reimbursable Project (RE), or Capital Replacement Project (RP)

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Asset Management System Summary – Lab

Agency Laboratory

1. Asset Profile

Agency Laboratory (Lab)
The Agency Laboratory (Lab) is located at Regional Water Recycling Plant No.5 in Chino. The Lab is certified by the California Department of Public Health Environmental Laboratory Accreditation Program (ELAP) to perform 12 fields of testing and 35 specific approved methods. The lab was constructed in 2018 and is approximately 17,166 square feet.

The Lab performs more than 80,000 analyses annually and sends out another 5,000 samples for analysis by a contracted laboratory. The Lab is broken into the following groups: Metals & Organic Chemistry, Inorganic & Wet Chemistry and Microbiology. The Lab analyzes samples from the Agency's wastewater plants, pretreatment and source control programs, desalination facility, and ground water recharge basins.

Metals & Organic Chemistry
The Metals & Organic Chemistry section is located in North Side of the Building. This type of chemistry uses specialized equipment to analyze a sample extract's makeup. Organic Chemistry specifically analyzes substances containing a carbon molecule. Metals/Inorganic Chemistry specifically analyzes substances that don't contain a carbon molecule. Some common analyses include mercury, metal salts, heavy metals, pesticides, and volatile and semi-volatile organics. Key pieces of equipment used are the Inductively Coupled Plasma Spectrometer (ICP), the ICP Mass Spectrometer (ICP MS), the Gas Chromatograph (GC), and GC Mass Spectrometer (GC MS).

Inorganic & Wet Chemistry
The Inorganic and Wet Chemistry section is located in the South Side of the building. This type of chemistry includes analyses performed in a liquid phase with beakers, test tubes and solvents. Some common analyses include TOC, BOC, COD, solids (total, dissolved, suspended, and volatile), ammonia, alkalinity, cyanide, and anions.

Microbiology
Microbiology is located in the South Side just east of Wet Chemistry. Microbiology is the study of microscopic organisms. Some common analyses include total and fecal coliform and bioassay. Bioassay is a specific scientific experiment that measures the effects of a substance on a living organism (Ceriodaphnia dubia; specie of water flea).

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Average)	Notes
Metals & Organic Chemistry		
Metals:		
Fume Hood	2 @ 100 fpm	
ICP	1 @ 157 sample batch	
ICP MS	1 unit	
Mercury Analyzer	1 @ 62 sample batch	
Auto Block Digester	1 @ 54 sample batch	
Peristaltic Pump	2 units	
Chiller (ICPs)	3 units	
Purelab water	1 units	
system	2 units	
Dishwaser	2 units	Min
Auto Sampler		Max
Organics Preparation:		
Fume Hood	8 @ 100 fpm	
Extractor System	2 units	
Kiln	1 @ 450ºC	Max
Oven	1 @ 300ºC	Max
Evaporator	3 @ 300 ml 2 @ 50 or 200 ml	
Dishwasher	2 units	Min
Chiller	2 unit	
Refrigerator	1 unit	
Nanopure	1 unit	
Semi-Volatile Organics:		
Fume Hood	1 @ 100 fpm	
GC	3 @ 25 min per sample	
GC MS	2 @ 25 min per sample	Min
LC MS	1 unit	Max
Auto Sampler	4 unit	Max
Hydrogen Generator	1 unit	Min
Lab bench refrigerator	2 units	Max
Nitrogen Generator	1 unit	
Volatile Organics:		
Fume Hood	1 @ 100 fpm	
GC MS	2 units	
Concentrator	2 @ 51 sample batch	
Auto Sampler	2 units	
Refrigerator	1 unit	
Freezer	1 unit	
Purge & Tap Concentrator	2 units	
Oven	1 unit	
Gas System:		
Argon	160 liters	
Helium	300 ft^3	
Nitrogen	200 ft^3	
DI Purification	1 unit	
Refrigerator	1 @ 960 ft^3 13 to 41ºF	
Inorganic & Wet Chemistry		
Fume Hood	7 @ 100 fpm	
Oven	3 @ 180ºC 2 @ 104ºC	
Furnace	1 @ 550ºC	
Incubator	1 @ 20ºC	Min
TOC Analyzer	3 units	
Ion Chromatograph	2 @ 49 sample batch	
Colorimeter	1 @ 120 sample batch	
Auto Colorimeter	2 unit	Max
Auto Sampler	5 @ 120 sample batch	Max
Auto Titrator	1 @ 36 sample batch	Max
Nano Pure Filter	1 unit	Max
Dishwasher	1 units	
Digestion Block	2 units	Max
Flow Segmented Analyzer	2 units	Max
Cyanide Analyzer	2 units	
Cyanide Auto Sampler	1 units	
Refrigerator	1 units	
Gas System:		
Helium	2 @ 200 ft^3 2 @ 300 ft^3	
Nitrogen	2 @ 300 ft^3	
DI Purification	1 unit	
Refrigerator	1 @ 960 ft^3 13 to 41ºF	
Microbiology		
Autoclave	1 @ 35ºC	
Incubator	2 @ 35ºC	
Water Bath	1 @ 44.5ºC	
Oven	2 @ 180ºC	
Bioassay Incubator	1 unit	
Quantitry Sealer	2 unit	
Refrigerator	1 unit	

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Metals & Organic Chemistry	4	4	3	4
Inorganic & Wet Chemistry	4	4	3	4
Microbiology	4	4	3	4

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

Metals & Organic Chemistry

The building has ventilation problems and roof leaks. A black dusty and gritty substance covers the counters and expensive lab equipment through all areas. The temperature controls for the building, which are crucial for sensitive lab equipment, fail regularly. The outdoor refrigerator requires routine spare parts, but the structure is sound. Because of constant upgrades of equipment, spare parts become unavailable through the manufacturers. The GC is currently being operated until failure.

The Lab Department will budget for routine replacement of equipment.

Project EN15008 will replace the existing laboratory at RP-1 and replace new lab equipment once the new lab is constructed.

Inorganic & Wet Chemistry
The building has a lack of storage space and problems with roof leaks, and a portion is inadequately protected from weather elements. In addition, there is concern about the effectiveness of the fume hoods. The outdoor refrigerator requires routine spare parts, but the structure is sound (same equipment as above). Because of constant upgrades of equipment, spare parts become unavailable through the manufacturers.

The Lab Department will budget for routine replacement of equipment.

The current Ion Chromatograph machine has fulfilled its need and is at the end of its useful life. A potential project will replace this machine and provide analysis for additional constituents.

Project EN15008 will replace the existing operation laboratory at RP-1.

Microbiology
Please refer to the Metals & Organic Chemistry discussion under Key Issues related to the building, as Microbiology shares the same building. The autoclave should be replaced every five to ten years; spare parts are used between replacements to ensure continuous operation.

The Lab Department will budget for routine replacement of equipment.

Project EN15008 will replace the existing operation laboratory at RP-1.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Metals & Organic Chemistry	2018	2005
Inorganic & Wet Chemistry	2018	2005
Microbiology	2018	2005

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
Wet Chemistry	Ion Chromatograph Machine Replacement	Replace and upgrade the current Ion Chromatograph machine

End of System Summary

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Agency Headquarters

Figure 7-14: Agency Headquarters – Schematic

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Table 7-13: Agency Headquarters – Project Summary

#	Project Number[1]	Project Name	Project Description	Fund[2]	Project Type[3]	Fiscal Year Budget (Dollars) 2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Ten-Year Total
1	EN20040	HQ Driveway Improvements (Julianne Frabizio)	Widen the east and west entrances and provide safe ingress/egress. Improve curbs, gutter, driveways, upgrade lights, sidewalks and landscaping. relocate boulders, lap posts, and any other interfering structure. Only 10 Parking stall removals at one time-work to be phased. Additional tree removals. Container shed relocation.	GG	CC	15,000	0	0	0	0	0	0	0	0	0	15,000
2	EN26032	HQ Electric Cart Canopy Project (Julianne Frabizio)		GG	RP				100,000	150,000						250,000
3	FM20001	HQ Interior Replacements (Matthew Poeske)	This project will plan design new paint, flooring, cubicles and lighting for the main Headquarters Buildings. Work may also include an outdoor cooking and eating area between the Lab and Building B.	GG	OM	0	0	0	100,000	750,000	1,782,000	0	0	0	0	2,632,000
4	PL17002	HQ Solar Photovoltaic Power Plants Ph. 2 (Pietro Cambiaso)		RC	CC					300,000	1,100,000					1,400,000
5	WU23007	National Theater for Children (Lisa Morgan-Perales)		WW	OM	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	80,000	800,000
6	EN21020	Primavera Enhancement (Stacey Scott)	Upgrade existing Primavera version to a more current version and utilize collaboration components of Primavera.	GG	CC	200,000	75,000	50,000								325,000
7	EN23099	CIPO Enhancements (Rachael Solis)		GG	CC	75,000	75,000									150,000
8	EN20008	EN20008 HQ Parking Lot FY19/20 (Julianne Frabizio)	Replace up to 40 slabs; replace up to 4 trees with compatible trees for the new slabs; Relocate 4 storage containers and sheds to the lay-down area on RP-5, to free up 4 parking spaces; Replace broken/failed permeable concrete at Building A and B; and, wash Permeable Concrete at building B.	GG	OM	15,000	0	0	0	0	0	0	0	0	0	15,000

(1) Project Number – from Ten-Year Capital Improvement Project; Final Capital Project List 03-17-2014

(2) Project Fund – Administrative Services (GG), Non-Reclaimed Water (NC), Regional Composting Authority (RM), Ground Water Recharge (RW), Recycled Water (WC), Regional Capital (RC), Regional O&M (RO), or Water Fund (WW)
(3) Project Type – Capital Construction Project (CC), Capital Major Equipment Project (EQ), Operations & Maintenance Project (OM), Reimbursable Project (RE), or Capital Replacement Project (RP)

Asset Management System Summary – HQ
Agency Headquarters and Park
1. Asset Profile

Headquarters
Structures
Two 33,000-square-foot tilt-up-construction single stores contain office space, conference rooms, a board room, and key information system equipment used for agency business functions. Most of the non-wastewater treatment staff uses these two buildings for day-to-day business. The buildings were built to LEED Platinum 2004 certifications by incorporating several eco-friendly sustainable components.

Heating Ventilation and Air Conditioning (HVAC)
The Central Energy Plant serves headquarters buildings A, B, and the RP-5 REEP control room. Each building is air conditioned with a single variable air volume (VAV) air handler with chilled and heated water coils. VAV and VAV with reheat (VAV/R) terminals are pressure independent. Heating is provided by hot water preheat coils in the air handlers and hot water reheat coils in the VAV/R terminals. The REEP control and electrical rooms are air conditioned with constant-volume chilled-water fan coils. There are a total of four chilled water nodes with a connected cooling load of 144.5 tons cooling. Space heating connected load is 590,000 btuh. Hot water is also used for radiant floor heating in the main entrances and locker rooms.

Plumbing
The headquarters facility has traditional plumbing to bathroom fixtures including sinks, showers, toilets, and flushless urinals. Other fixtures include custodian closets and various outdoor hose bibs. Main lines feed hot water from the central plant to the building, where the hot water is used in various heating and cooling aspects of the building. The building is also equipped with a fire suppression system.

Chino Creek Wetlands and Educational Park
The 22-acre park was designed to restore native habitat and natural drainage that feeds into Chino Creek Reach I, showcasing the environmental values of this ecologically rich region of Southern California.

Water Ponds
An aesthetic water feature receives flow from a recycled water service. The ponds hold water and can recirculate for a waterfall feature between the two ponds. The overflow of the ponds flows down a stream to the extended detention basin.

Extended Detention Basin
The detention pond provides initial storage and detention for storm flows. It also serves as a preliminary settling pond for sediments, potentially reducing total suspended solids, and provides the primary storage pool, where flows are conveyed to one of three flow paths: the Surface Flow Wetlands and the Subsurface Flow Wetlands via two stop-log structures. A concrete/rip rap spillway is provided for the 100-year-storm event that would overflow the stop-log structures. The spillway feeds the surface bioswale system.

Surface Wetlands
The Surface Wetlands is a series of several deep water ponds that provide traditional natural system nutrient removal. A combination of emergent vegetation bands and deep and shallow zones provides higher retention time and less hydraulic short-circuiting and supports the microbial processes that result in water quality improvement. The final pond/habitat lake includes dense patches of emergent marsh and open water to provide suitable foraging habitat for water birds. Flow from the habitat lake exits a stop-log structure and flows to the effluent structure.

Subsurface Wetlands
Flow from the detention basin stop-log structure enters three engineered wetland cells. Each cell has a loose pea-gravel soil mixture that supports the root structure of nutrient-removal plant species. The configuration provides high surface area of water flows to the plant root structure for nutrient removal, low potential for hydraulic short-circuiting, and the most potential for highly efficient nutrient removal. Each cell controls the water level via a stop-log structure.

Bioswale
The bioswale system receives overflow from the extended detention basin and directs flow to the effluent structure. The bioswale has several energy-dissipation and soil-stabilization components, including planted willows, mulefat, geotextile soil fabric, rip rap, and a large stabilized tree root bole.

Intermittent Stream
The intermittent stream on the west side of the site conveys infrequent storm flows, providing preliminary water quality treatment, and consists of drier riparian habitats. Upland woodland and grassland areas provide aesthetically pleasing areas for visitors to walk through and picnic, while demonstrating upland habitats historically common in many hillsides and valleys. The effluent flow from this system flows into the effluent structure.

Effluent Structure
The concrete effluent structure receives surface flow from the intermittent-stream and swale system and bioswale system and receives piped flow from the Habitat Lake. The combined flow then flows south to the RP-5 Santa Ana River Outfall, where it follows the existing waterways.

Education
The purposes of the wetlands are to demonstrate natural-water treatment and upland habitats. The Agency encourages educational awareness through interactive trails with informational signage throughout the park, an information center, scheduled tours, the distribution of educational pamphlets and materials, and presentations to local/regional schools
The education and informational stations focus on different water and wetlands themes. Station examples include water testing, microscopic pond life viewing, and bird watching. Some stations consist of large obsolete wastewater treatment plant equipment that has been modified and placed in the park to serve as an elevated lookout platform; visual volume references; and shade structure. There is appropriate signage for each station. The Park also has a small portable building used for storage and office space to facility educational opportunities in the Park.

2. Capacity Profile
Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
Headquarters	14 acres	
Structures	2 at 33,000 sq ft ea. 194 Office spaces 11 Conference Rooms 7 kitchens	
HVAC	144.5 cooling tons 590,000 btuh space heating	
Plumbing	35 toilets 12 urinals 33 sinks 9 showers	
Chino Creek Park	22 acres	
Water Ponds	2 pumps @ 350 gpm	
Extended Detention Basin	3.1 acre-ft	Volume
Surface Wetlands	7.3 acre-ft	Volume
Subsurface Wetlands Pea Gravel	3 cells Approx. 170 ft by 40 ft 2.5 ft depth	Each
Bio swale	700 LF	
Intermittent Stream	1300LF	
Effluent Structure	20 ft x 8 ft x 6 ft	Vault
Education Stations Trails	11 stations 1.7 miles	

3. Asset Ratings
Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Headquarters				
Structures	4	3	3	3
HVAC	4	3	3	4
Plumbing	2	3	2	3
Chino Creek Park				
Water Ponds	3	3	3	3
Extended Detention Basin	4	3	3	4
Surface Wetlands	3	3	3	3
Subsurface Wetlands	4	3	3	3
Bioswale	2	3	3	3
Intermittent Stream	3	3	3	3
Effluent Structure	2	3	3	3
Education	3	3	4	3

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation
Headquarters
Structures
Cracks have been observed on the walls and parking spaces, indicating differential settling of the ground under the headquarters complex. A potential project will evaluate the extent of the settling to address its impacts. Roofing leaks have been observed during wet weather periods. A potential project will repair/replace the roof diaphragm.

Heating Ventilation and Air Conditioning (HVAC)
The Central Energy Plant has limited backup equipment and is undersized for future expected uses, specifically the future Central Lab project. Since the recent rehab, the Central Plant is still having issues, so a condition assessment is needed to identify potential solutions.
A potential project is needed upgrade controls, add backup equipment and expand process required for future uses.

Plumbing
Last year the fire-suppression-system piping broke, flooding a large portion of the headquarters office space. The failure was caused by excessive corrosion. Maintenance has a project to evaluate the condition of all the piping at the headquarters complex. Recent vandalism and theft has resulted in equipment being stolen from the Agency property.

Chino Creek Wetlands and Educational Park
Extended Detention Basin
Soil erosion has been observed on several slopes of the extended detention basin from storm water runoff. Engineering is working on projects to protect the slopes from further erosion.

Education
The park currently has limited use for school field trips and outreach because of the lack of shaded areas and permanent restroom facilities.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Headquarters		
Structures	2003	2013/2014
HVAC	2003	Planned 2015
Plumbing	2003	
Chino Creek Park		
Water Ponds	2003	
Extended Detention Basin	2007	
Surface Wetlands	2007	
Subsurface Wetlands	2007	
Bioswale	2007	
Intermittent Stream	2007	
Effluent Structure	2007	
Education	2007	

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
HQ Structures	HQ Parking Lot	Remove and Replace concrete stalls, remove and replace trees, and install root barriers.
HQ HVAC	Central Energy Plant HVAC	Upgrade controls, add backup equipment and expand process required for future uses
HQ Structures	HQ Roofing Repairs	Repair or Replace roof diaphragm to reduce leakage during wet weather.

End of System Summary

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Business and Process Automation Control Networks

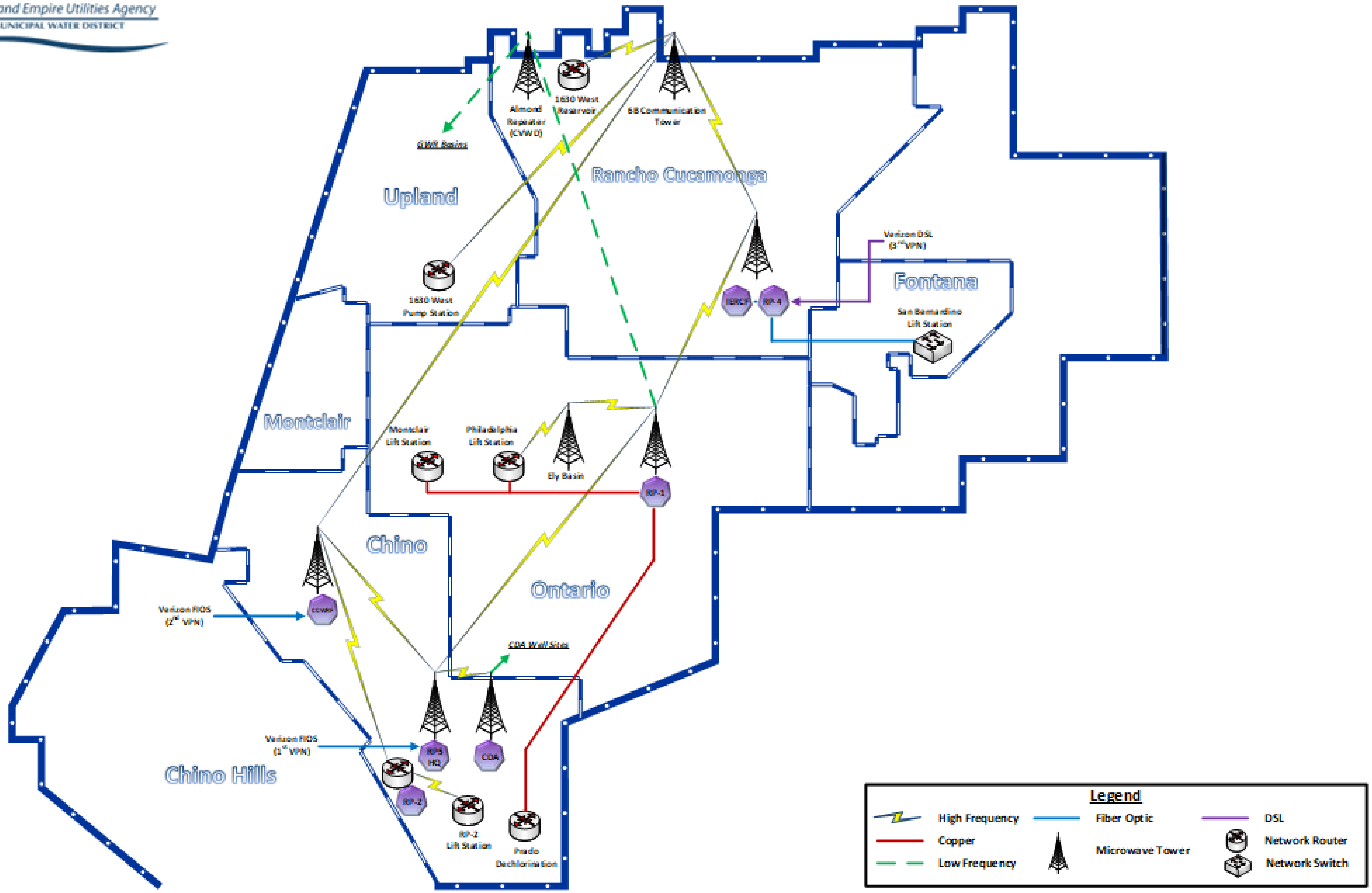

Figure 7-15: Business (BIZ) & Process Automation Control (PAC) Networks – Schematic

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Table 7-14: Business Network and Process Automation Control Network – Project Summary

#	Project Number[1]	Project Name	Project Description	Fund[2]	Project Type[3]	Fiscal Year Budget (Dollars)										
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Ten-Year Total
1	IS25002	ERP Implementation (Kanes Pantayatiwong)		GG	RP			1,000,000	5,000,000	4,000,000						10,000,000
2	IS22003	IT Infrastructure Assets New (Donald Hamlett)		GG	EQ	80,000										80,000
3	IS22004	IT Infrastructure Assets Replacement (Donald Hamlett)		GG	EQ	390,000										390,000
4	PL23002	PTSC Linko Database Upgrade (Kenneth Tam)		RO	OM	25,000										25,000
5	IS22006	SCADA Network Infrastructure Replacement (Donald Hamlett)		GG	EQ	300,000										300,000
6	IS23001	Virtual Phone System Transition (Donald Hamlett)		GG	OM	45,000										45,000
7	IS22002	Wide Area Microwave Radio Updates (Donald Hamlett)		GG	EQ	220,000										220,000
8	EN24020	IEUA SCADA Master Plan (Pierre Cayatte)		RC	CC	0	500,000					250,000				750,000
9	EN13016	SCADA Enterprise System (Pierre Cayatte)	The project will migrate the Agency's wastewater facilities from the Foxboro-Invensys DCS to an Rockwell Automation SCADA Enterprise System. This project includes several phases of a SCADA migration, including CCWRF, RP-1, RP-4, and RP-5. The scope for this project includes design, procurement, installation and programming of a new SCADA system. In doing this, several central control panels and equipment will need to be overhauled. The project will consist of several tasks including, SCADA system design (physical and operator screens), procurement, installation, integration, and cutover & testing of the upgrades to the network, supervisory control, direct control,	RO	CC	5,000,000	6,200,000	1,000,000								12,200,000

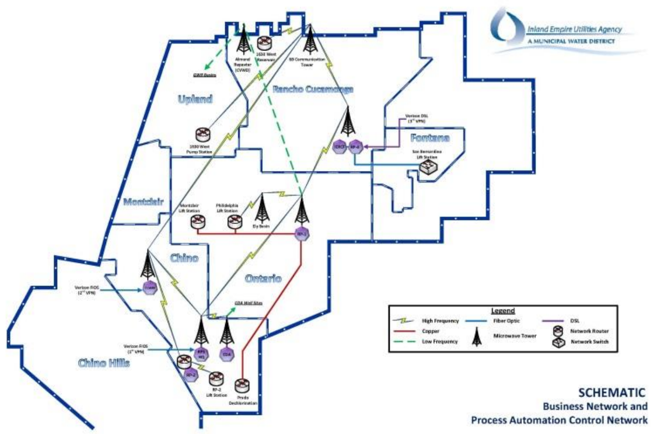
#	Project Number[1]	Project Name	Project Description	Fund[2]	Project Type[3]	Fiscal Year Budget (Dollars)										
						2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	Ten-Year Total
			Operations Data Management Systems, reporting, etc. for all of the Agency's five major WW facilities.													

(1) Project Number – from Ten-Year Capital Improvement Project; Final Capital Project List 03-17-2014
(2) Project Fund – Administrative Services (GG), Non-Reclaimed Water (NC), Regional Composting Authority (RM), Ground Water Recharge (RW), Recycled Water (WC), Regional Capital (RC), Regional O&M (RO), or Water Fund (WW)
(3) Project Type – Capital Construction Project (CC), Capital Major Equipment Project (EQ), Operations & Maintenance Project (OM), Reimbursable Project (RE), or Capital Replacement Project (RP)

Asset Management System Summary – BIZ/PAC

Business Networks

1. Asset Profile



Business Network
The Business Network (BIZ) is an Agency network that connects local area business networks throughout the Agency together through the use of a wireless Wide Area Network (WAN) and provides access to the internet. Communication within the network is transmitted through cable media and wireless media. The wireless media communication supports the BIZ and Process Automation & Control (PAC) systems. BIZ provides the shared use of business-related resources, such as storage servers, printers, email, and interpersonal communications. The BIZ is composed of servers located at the Headquarters Buildings, RP-1, and RP-5. Network switches connect each networked asset to the BIZ network. There are two sets of assets included in the BIZ: productivity tools and fixed assets.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Average)	Notes
BIZ – Productivity Tools		
A/V Equipment	14 units	
Cell Phone	76 units	
Camera	18 units	
Mobile Hot Spot	55 units	
Monitor	660 units	
Printer	125 units	
Scanner	21 units	
Tablet	23 units	
Workstation	300 units	
BIZ – Fixed Assets		
Server		
HyperV	12 units	
Server	50 units	
VMware	11 units	
UPS	4 units	
Network Switch	90 units	

3. Asset Ratings

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
BIZ – Productivity Tools	3	3	3	3
BIZ – Fixed Assets	3	3	3	3

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation

BIZ and PAC Networks
Assets are replaced based on product lifecycle. A technology consultant is evaluating the BIZ and PAC networks to analyze potential hardware and software upgrades; Project IS15012.

Equipment replacement lifecycle: PLC (12 years), UPS (10 years), Workstation (4 years), OIT (10 years), server (5 years), I/O (15 years), Printer (10 years), network switches (10 years), and software licenses are typically renewed annually.

BIZ – Productivity Tools
Maintenance projects related to equipment replacement based on the product's lifecycle will be budgeted in the Department's budget for routine replacement and rehab of assets.

BIZ – Fixed Assets
Maintenance projects related to equipment replacement based on the product's lifecycle will be budgeted in the Department's budget for routine replacement and rehab of assets.

Table 3 History of Select Assets

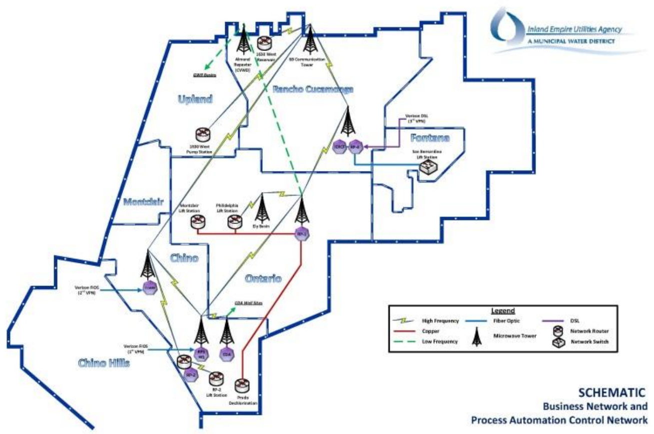
System	Capital Improvement Project Activity	Condition Assessment Report
BIZ – Productivity Tools		
BIZ – Fixed Assets		

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

Asset Management System Summary – BIZ/PAC
Process Automation Control Networks
1. Asset Profile



Process Automation & Control (PAC)
The Process Automation & Control System (PAC) is an Agency network that connects local area process automation networks together through a wireless Wide Area Network (WAN). The communications within the networks are transmitted through cable media and wireless media. A series of microwave transmitting towers creates a loop of wireless communication linking all the facilities. The primary communication towers are located at RP-1, CCWRF, RP-4, RP-5, and the Northwest 6B Tower. Cucamonga Valley Water District's Almond Street Repeater provides communication and control of the ground water recharge basins. Network switches connect PLCs, operator work stations, and other network devices connected to the PAC network. An operator is able to log on the PAC network to control and monitor a facility using the Supervisory Control and Data Acquisition (SCADA) system or Distributed Control System (DCS) system.

The SCADA systems are composed of Rockwell Automation software and Allen Bradley PLCs. The DCS systems use the Foxboro DCS system from Invensys and a combination of Invensys Control Processors and Allen Bradley PLCs. Field output data is transmitted to either a PLC or a centralized control processor, and the SCADA/DCS systems provide a single platform to monitor all the field data, make set point changes, establish/monitor alarm conditions, and control equipment within an entire facility. Field data is also transmitted to a historian, that is, a storage server, to allow trending or analytical analysis in the future.

There are two sets of assets included in the PAC: productivity tools and other fixed assets.

2. Capacity Profile
Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Average)	Notes
Productivity Tools Tablet Workstation	 25 units 50 units	
Fixed Assets Microwave IEUA CVWD DCS System SCADA System Server HyperV Server VMware UPS Network Switch PLC OIT	 5 units 1 unit 4 units 4 units 3 units 49 units 15 units 88 units 120 units 250 units 140 units	

3. Asset Ratings
Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Productivity Tools	3	3	3	3
Fixed Assets	4	4	3	4

* Ratings as defined in Appendix A; General System Assets

4. Key Issues for Further Investigation
PAC Networks
Assets are replaced based on product lifecycle. A technology consultant is evaluating the BIZ and PAC networks to analyze potential hardware and software upgrades; Project IS15012.

Equipment replacement lifecycle: PLC (12 years), UPS (10 years), Workstation (4 years), OIT (10 years), server (5 years), I/O (15 years), Printer (10 years), network switches (10 years), and software licenses are typically renewed annually.

BIZ – Productivity Tools
Maintenance projects related to equipment replacement based on the product's lifecycle will be budgeted in the Department's budget for routine replacement and rehab of assets.

BIZ – Fixed Assets
Maintenance projects related to equipment replacement based on the product's lifecycle will be budgeted in the Department's budget for routine replacement and rehab of assets.

PAC – Productivity Tools
Maintenance will be budgeted in the Department's budget for routine replacement and rehab of assets.

PAC – Fixed Assets
Maintenance projects related to equipment replacement based on the product's lifecycle will be budgeted in the Department's budget for routine replacement and rehab of assets. Project IS15020 will improve the network annually.

To improve communication new monopoles, radios, and microwaves are being installed under Project EN13040, EN13042, and EN13043.

DCS software and associated hardware need to be updated. Currently the Agency operates two different SCADA systems; it is the Agency's goal to transition to Allen Bradley PLC driven control. Project EN13016 will replace the current DCS system.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Microwave Towers		
Fixed Assets		

* Appendix B – Condition Assessment Reports

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

End of System Summary

Appendix A: Asset Ratings

Definitions of the ratings for each of the Failure Modes

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ASSET RATINGS DEFINITIONS

A. GENERAL SYSTEM ASSETS:

Table A-1 Condition Rating

Rating	Definition
1	New or Excellent Condition
2	Minor Defects Only
3	Moderate Deterioration (Does not require immediate action)
4	Significant Deterioration
5	Virtually Unserviceable

The rating is intended to show the degree of deterioration to structures and equipment.

Table A-2 Redundancy Rating

Rating	Definition
1	High level of redundancy – treatment process is not impacted by multiple units being out of service
2	Significant level of redundancy – treatment process is not impacted by one unit being out of service for an extended period of time
3	Adequate level of redundancy – treatment process is not impacted by one unit being out of service
4	Inadequate level of redundancy – treatment process is negatively impacted by one unit being out of service
5	No redundancy – intended process function cannot be achieved when asset is out of service

The rating is intended to show the impact to the treatment process when the asset in question is out of service.

Table A-3 Function Rating

Rating	Description
1	Exceeds all Functional Requirements
2	Exceeds some Functional Requirements
3	Meets all Functional Requirements
4	Fails some Functional Requirements
5	Fails all Functional Requirements

The rating is the ability for the asset to meet the functional requirements that allow performance targets to be met.

Table A-4 Reliability Rating

Rating	Definition
1	Frequency of failure is significantly lower than expected
2	Frequency of failure is lower than expected
3	Frequency of failure is consistent with design expectations
4	Frequency of failure is higher than expected
5	Frequency of failure is significantly higher than expected

The rating is intended to show the tendency for the asset to experience a failure.

B. COLLECTION SYSTEM ASSETS

Table B-1 Condition Rating

Rating	Definition
1	New Condition (Excellent)
2	Minor Defects Only (Good)
3	Moderate Deterioration (Does not require immediate action)
4	Significant Deterioration (Poor)
5	Virtually Unserviceable (Failing)

- *If the inspector feels that corrective measures are needed within 6 months, then the rating would be 5 (immediate/emergency work to be done).*
- *If the inspector feels that corrective measures are needed within 2 years, then the rating would be 4 (request rehab/repair work to be designed and executed by Engineering). Note: need to discuss whether 2 years is the right number or maybe 3 years.*
- *If the inspector feels that corrective measures are not needed but the asset should be re-inspected within 3 years, then the rating would be 3.*
- *If the inspector feels that corrective measures are not needed and the asset can be re-inspected in 5 years, then the rating would be 2.*
- *If the inspector feels that corrective measures are not needed and the asset can be considered for re-inspection beyond 5 years, then the rating would be 1.*

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Appendix B: Condition Assessment Reports

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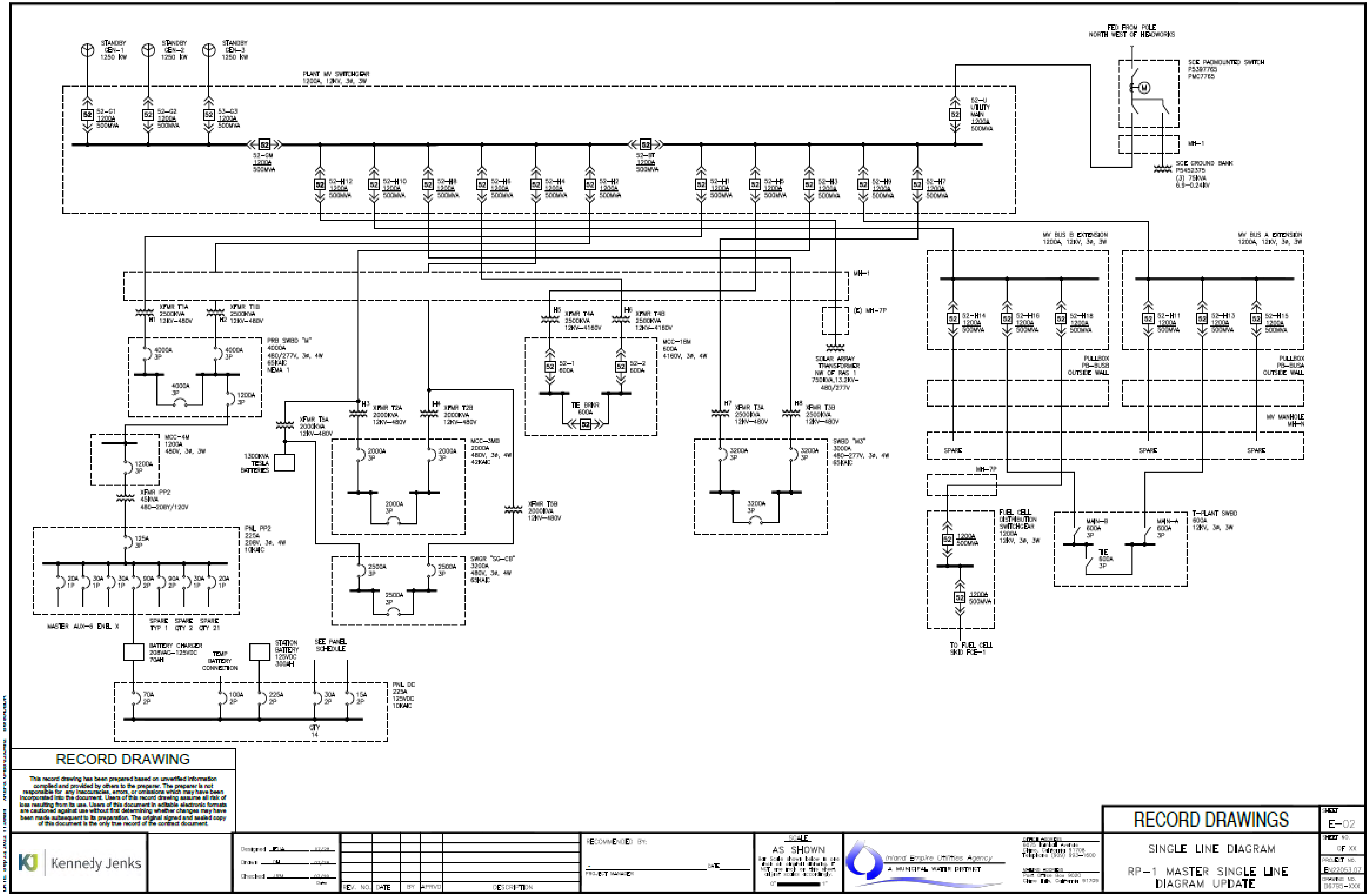
Condition assessment reports can be found on AIM at the following link:

Asset Management Information Portal - Condition Assessments - All Documents (sharepoint.com)

Appendix C: Electrical Single Line Diagrams



STANDBY GEN-1 1250 kW
STANDBY GEN-2 1250 kW
STANDBY GEN-3 1250 kW
PLANT MV SWITCHGEAR 1200A, 12KV, 3Ø, 3W
FED FROM POLE NORTH WEST OF HEADWORKS
SCE PADMOUNTED SWITCH
SCE GROUND BANK
MV BUS B EXTENSION 1200A, 12KV, 3Ø, 3W
MV BUS A EXTENSION 1200A, 12KV, 3Ø, 3W
SOLAR ARRAY TRANSFORMER
TO FUEL CELL SKID FCE-1
RECORD DRAWING
Kennedy Jenks
AS SHOWN
Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT
RECORD DRAWINGS
SINGLE LINE DIAGRAM
RP-1 MASTER SINGLE LINE DIAGRAM UPDATE
E-02

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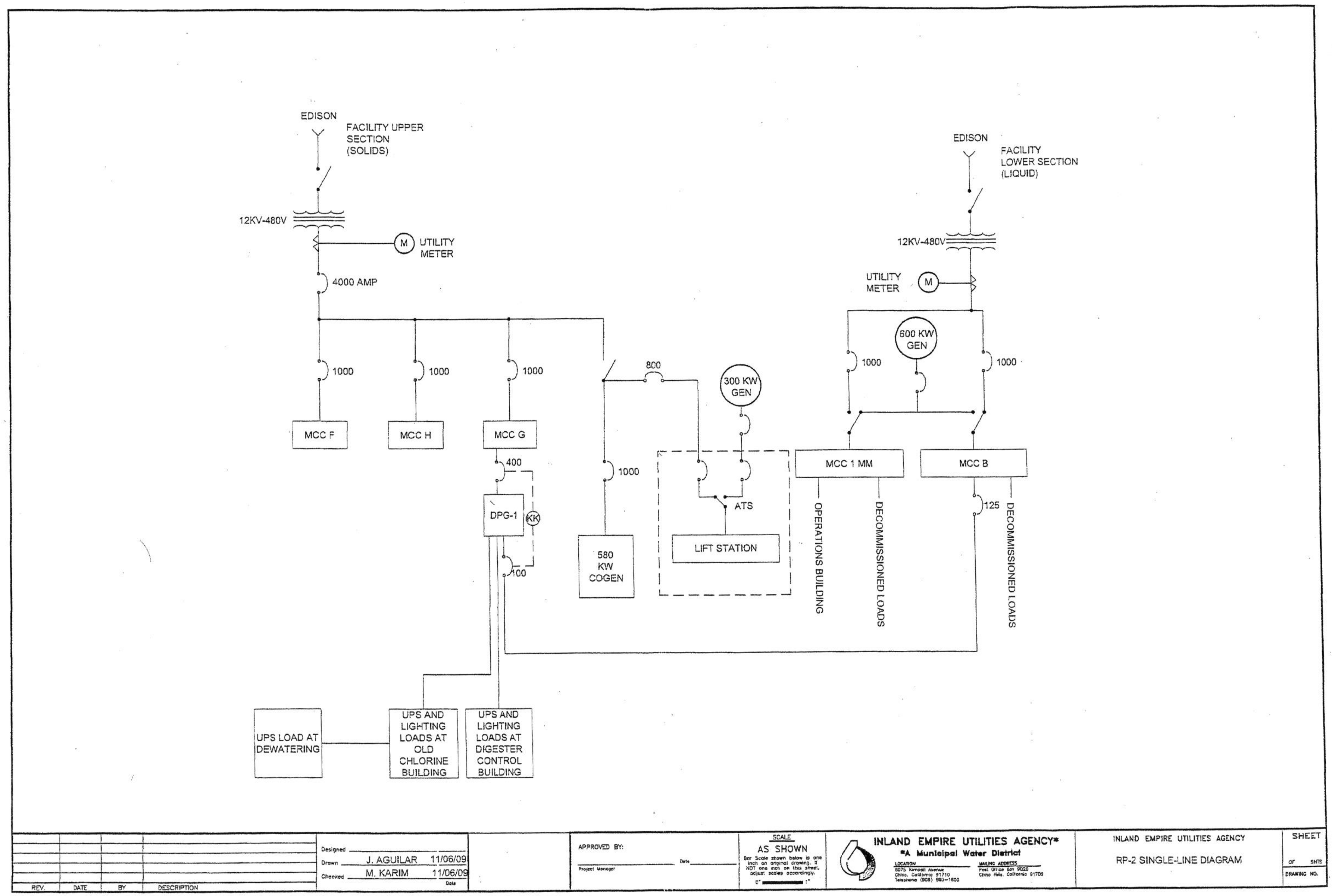
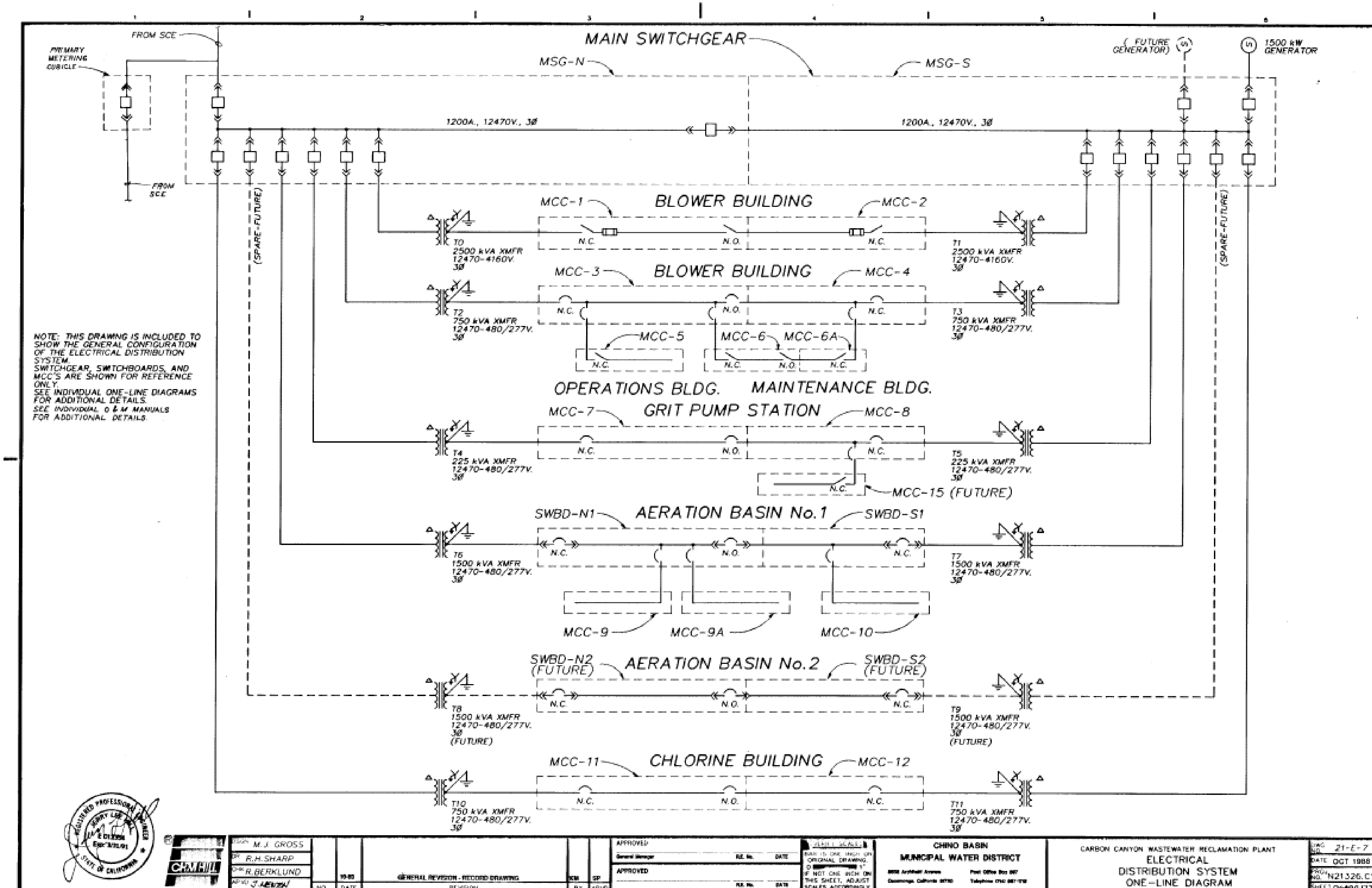
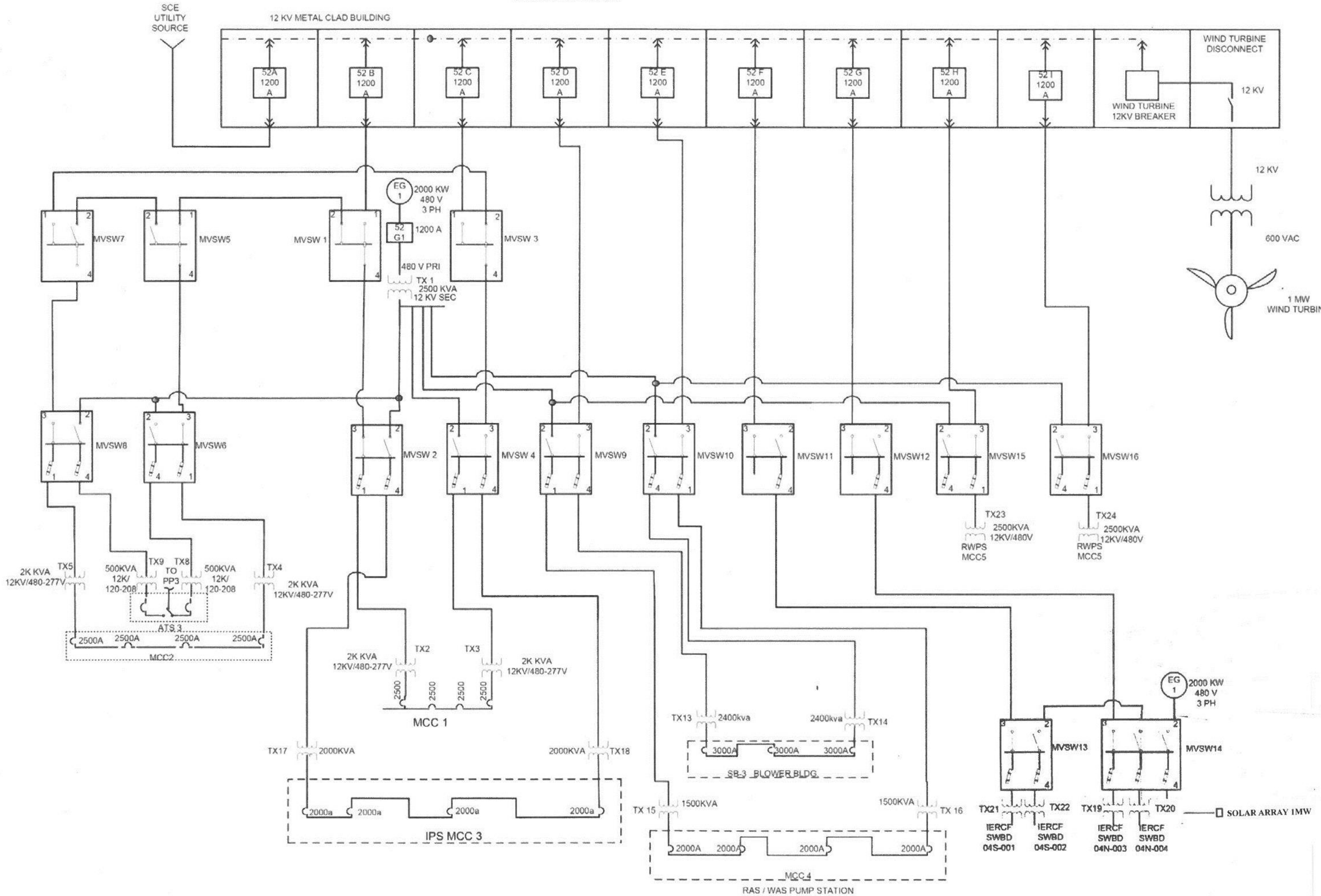
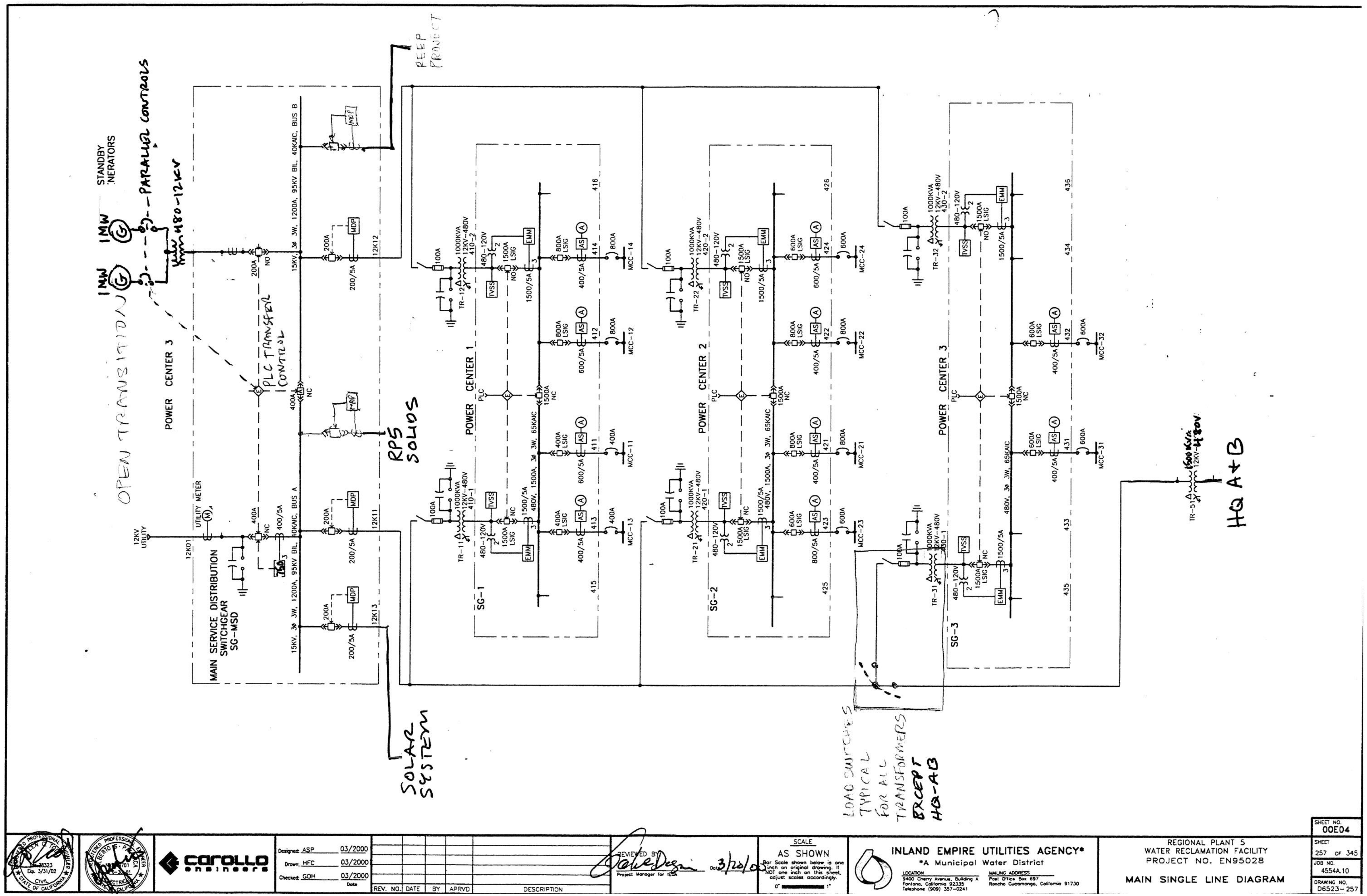
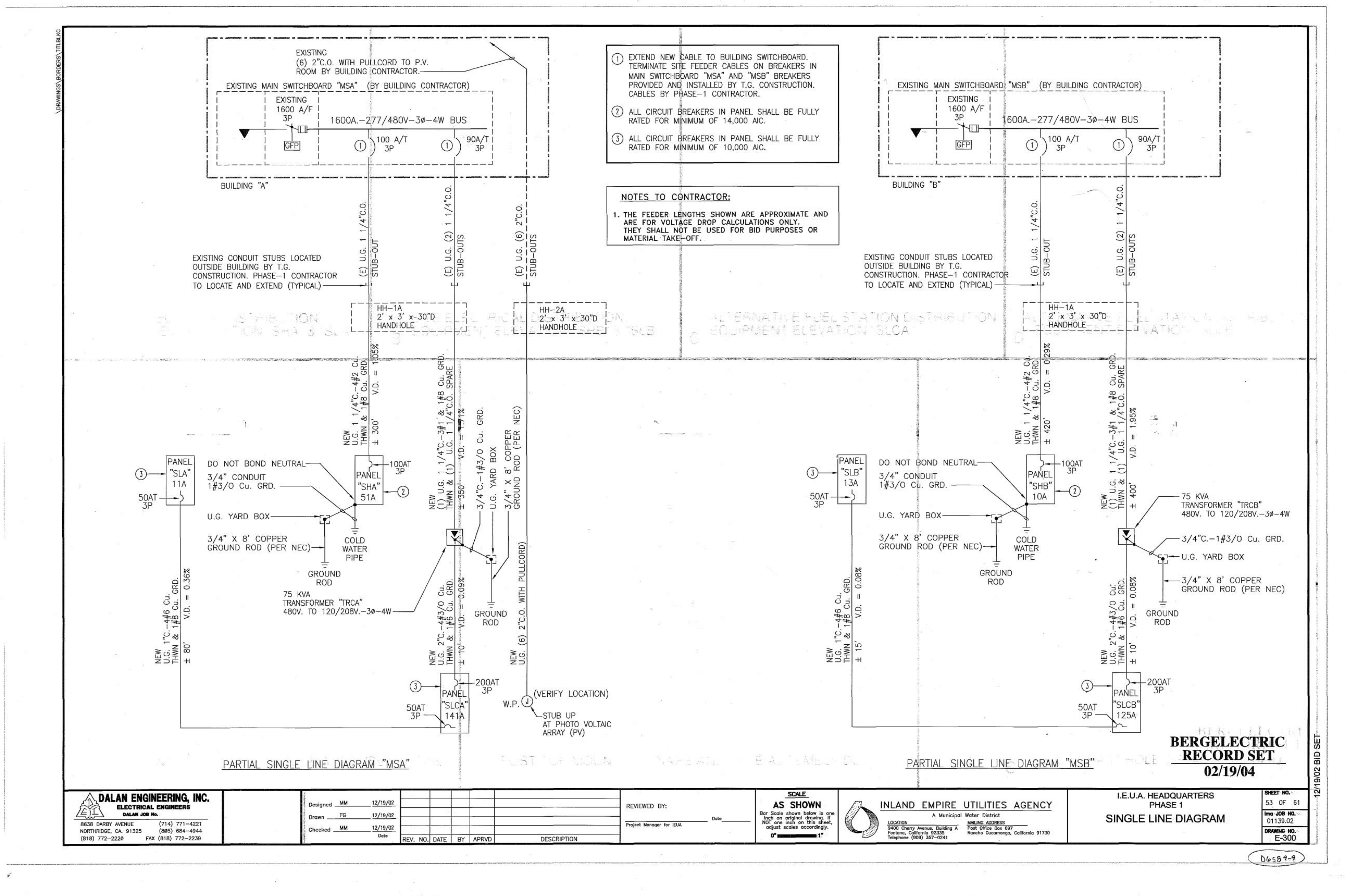

EDISON
FACILITY UPPER SECTION (SOLIDS)
12KV-480V
M
UTILITY METER
4000 AMP
1000
1000
1000
800
300 KW GEN
MCC F
MCC H
MCC G
400
DPG-1
KK
100
1000
580 KW COGEN
ATS
LIFT STATION
UPS LOAD AT DEWATERING
UPS AND LIGHTING LOADS AT OLD CHLORINE BUILDING
UPS AND LIGHTING LOADS AT DIGESTER CONTROL BUILDING
EDISON
FACILITY LOWER SECTION (LIQUID)
12KV-480V
UTILITY METER
M
600 KW GEN
1000
1000
MCC 1 MM
MCC B
125
OPERATIONS BUILDING
DECOMMISSIONED LOADS
DECOMMISSIONED LOADS
REV. DATE BY DESCRIPTION
Designed
Drawn J. AGUILAR 11/06/09
Checked M. KARIM 11/06/09
APPROVED BY:
SCALE
AS SHOWN
INLAND EMPIRE UTILITIES AGENCY*
*A Municipal Water District
INLAND EMPIRE UTILITIES AGENCY
RP-2 SINGLE-LINE DIAGRAM
SHEET


MAIN SWITCHGEAR
MSG-N
MSG-S
FROM SCE
PRIMARY METERING CUBICLE
(FUTURE GENERATOR)
1500 kW GENERATOR
1200A., 12470V., 3Ø
1200A., 12470V., 3Ø
(SPARE-FUTURE)
BLOWER BUILDING
MCC-1
MCC-2
T0 2500 kVA XMFR 12470-4160V. 3Ø
T1 2500 kVA XMFR 12470-4160V. 3Ø
BLOWER BUILDING
MCC-3
MCC-4
T2 750 kVA XMFR 12470-480/277V. 3Ø
T3 750 kVA XMFR 12470-480/277V. 3Ø
MCC-5
MCC-6
MCC-6A
OPERATIONS BLDG.
MAINTENANCE BLDG.
GRIT PUMP STATION
MCC-7
MCC-8
T4 225 kVA XMFR 12470-480/277V. 3Ø
T5 225 kVA XMFR 12470-480/277V. 3Ø
MCC-15 (FUTURE)
AERATION BASIN No.1
SWBD-N1
SWBD-S1
T6 1500 kVA XMFR 12470-480/277V. 3Ø
T7 1500 kVA XMFR 12470-480/277V. 3Ø
MCC-9
MCC-9A
MCC-10
AERATION BASIN No.2
SWBD-N2 (FUTURE)
SWBD-S2 (FUTURE)
T8 1500 kVA XMFR 12470-480/277V. 3Ø (FUTURE)
T9 1500 kVA XMFR 12470-480/277V. 3Ø (FUTURE)
CHLORINE BUILDING
MCC-11
MCC-12
T10 750 kVA XMFR 12470-480/277V. 3Ø
T11 750 kVA XMFR 12470-480/277V. 3Ø
N.C.
N.O.
NOTE: THIS DRAWING IS INCLUDED TO SHOW THE GENERAL CONFIGURATION OF THE ELECTRICAL DISTRIBUTION SYSTEM.
SWITCHGEAR, SWITCHBOARDS, AND MCC'S ARE SHOWN FOR REFERENCE ONLY.
SEE INDIVIDUAL ONE-LINE DIAGRAMS FOR ADDITIONAL DETAILS.
SEE INDIVIDUAL O & M MANUALS FOR ADDITIONAL DETAILS.
CH2M HILL
M.J. GROSS
R.H. SHARP
R. BERKLUND
GENERAL REVISION - RECORD DRAWING
CHINO BASIN MUNICIPAL WATER DISTRICT
CARBON CANYON WASTEWATER RECLAMATION PLANT
ELECTRICAL DISTRIBUTION SYSTEM ONE-LINE DIAGRAM
21-E-7
OCT 1988
N21326.C1

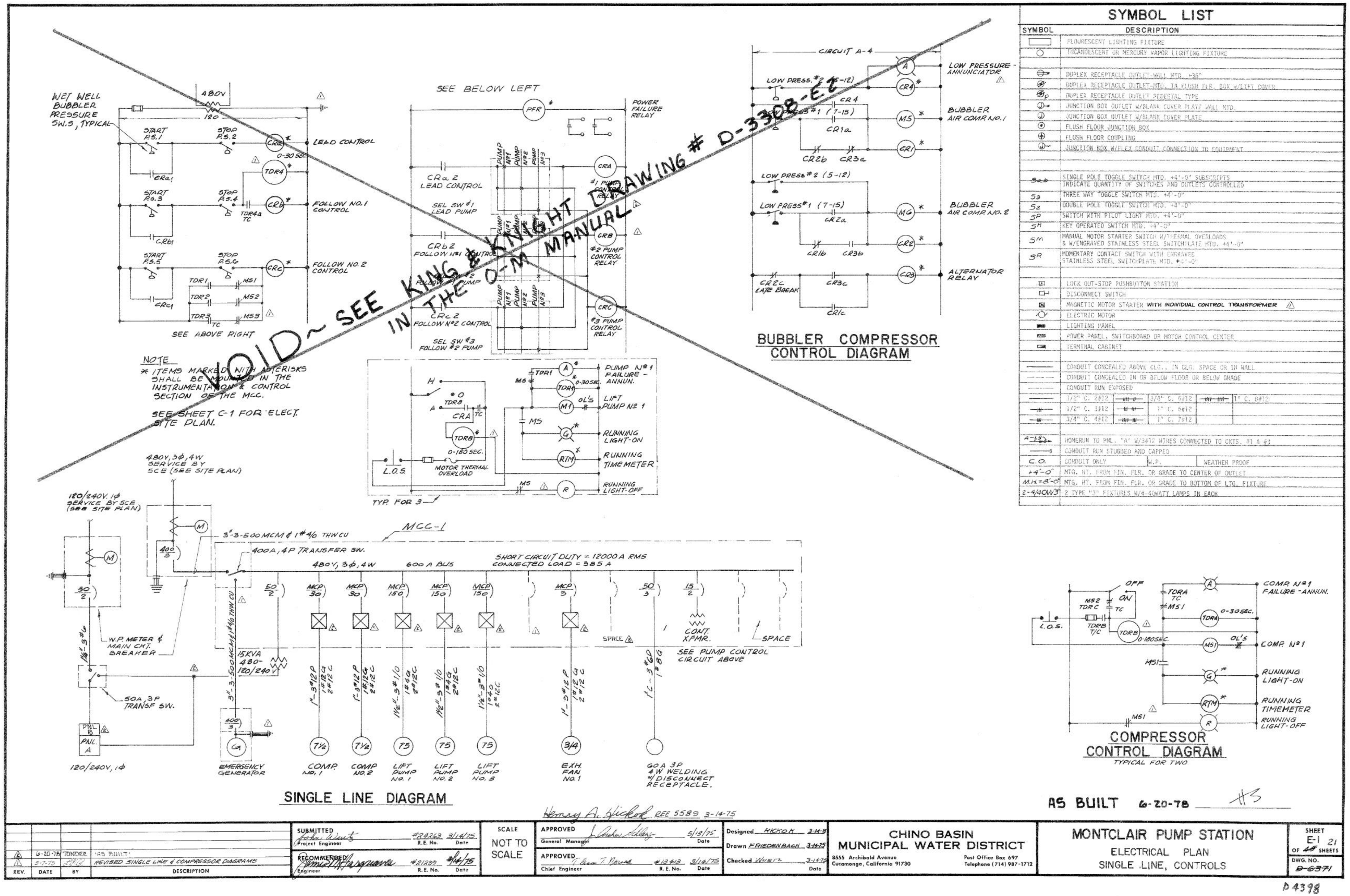
RP 4 12 KV SINGLE LINE

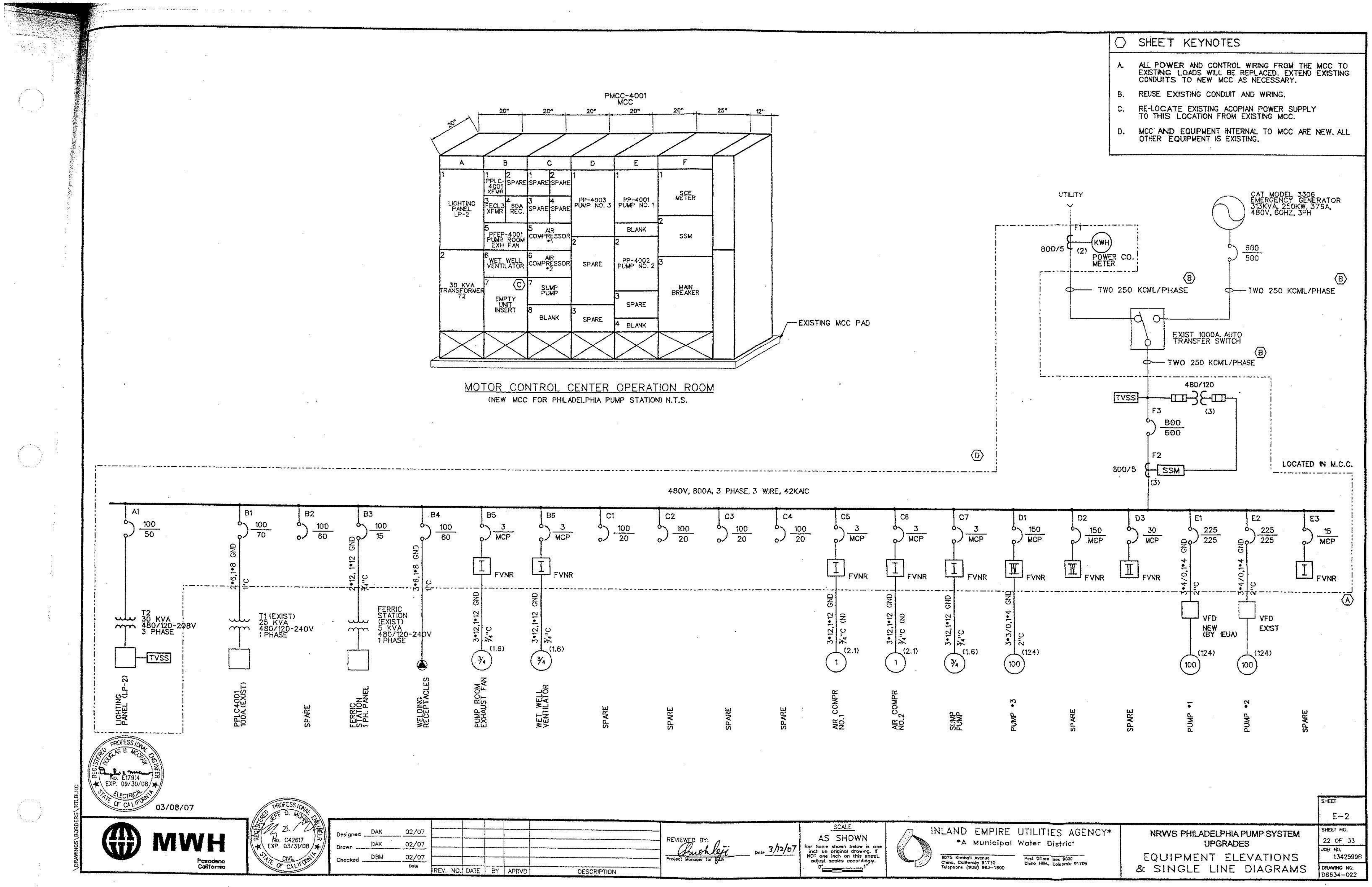


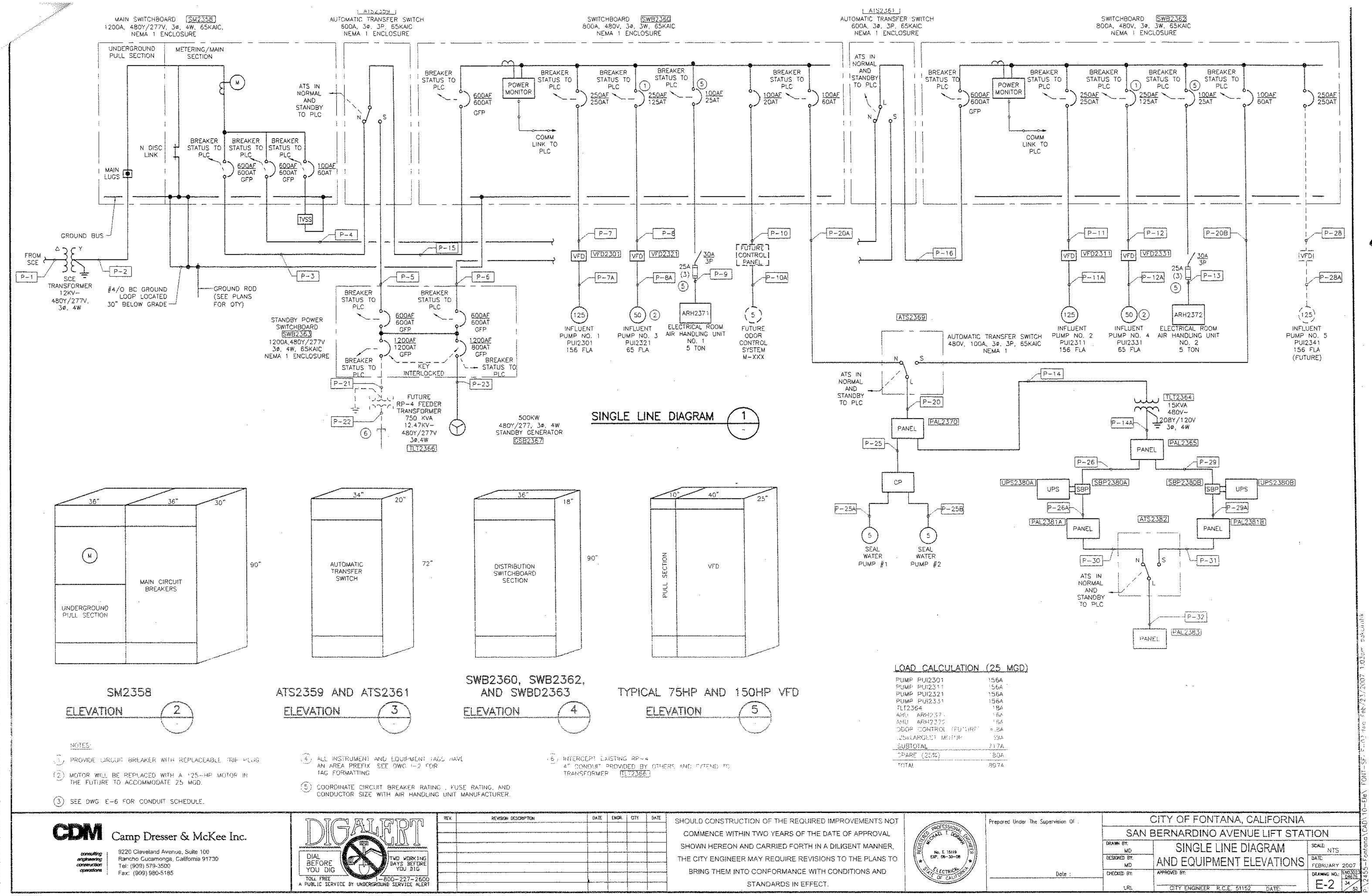

AS SHOWN
INLAND EMPIRE UTILITIES AGENCY*
*A Municipal Water District
REGIONAL PLANT 5
WATER RECLAMATION FACILITY
PROJECT NO. EN95028
MAIN SINGLE LINE DIAGRAM
00E04
257 OF 345
4554A.10
D6523-257



EXISTING (6) 2"C.O. WITH PULLCORD TO P.V. ROOM BY BUILDING CONTRACTOR.
EXISTING MAIN SWITCHBOARD "MSA" (BY BUILDING CONTRACTOR)
EXISTING 1600 A/F 3P
1600A.-277/480V-3ø-4W BUS
GFP
100 A/T 3P
90A/T 3P
BUILDING "A"
1 EXTEND NEW CABLE TO BUILDING SWITCHBOARD. TERMINATE SITE FEEDER CABLES ON BREAKERS IN MAIN SWITCHBOARD "MSA" AND "MSB" BREAKERS PROVIDED AND INSTALLED BY T.G. CONSTRUCTION. CABLES BY PHASE-1 CONTRACTOR.
2 ALL CIRCUIT BREAKERS IN PANEL SHALL BE FULLY RATED FOR MINIMUM OF 14,000 AIC.
3 ALL CIRCUIT BREAKERS IN PANEL SHALL BE FULLY RATED FOR MINIMUM OF 10,000 AIC.
NOTES TO CONTRACTOR:
1. THE FEEDER LENGTHS SHOWN ARE APPROXIMATE AND ARE FOR VOLTAGE DROP CALCULATIONS ONLY. THEY SHALL NOT BE USED FOR BID PURPOSES OR MATERIAL TAKE-OFF.
EXISTING MAIN SWITCHBOARD "MSB" (BY BUILDING CONTRACTOR)
BUILDING "B"
EXISTING CONDUIT STUBS LOCATED OUTSIDE BUILDING BY T.G. CONSTRUCTION. PHASE-1 CONTRACTOR TO LOCATE AND EXTEND (TYPICAL)
(E) U.G. 1 1/4"C.O. STUB-OUT
(E) U.G. (2) 1 1/4"C.O. STUB-OUTS
(E) U.G. (6) 2"C.O. STUB-OUTS
HH-1A 2' x 3' x 30"D HANDHOLE
HH-2A 2' x 3' x 30"D HANDHOLE
NEW U.G. 1 1/4"C.-4#2 Cu. THWN & 1#8 Cu. GRD. ± 300' V.D. = 1.05%
NEW (1) U.G. 1 1/4"C.-3#1 & 1#8 Cu. GRD. THWN & (1) U.G. 1 1/4"C.O. SPARE ± 350' V.D. = 1.71%
3/4"C.-1#3/0 Cu. GRD.
U.G. YARD BOX
3/4" X 8' COPPER GROUND ROD (PER NEC)
PANEL "SLA" 11A
50AT 3P
DO NOT BOND NEUTRAL
3/4" CONDUIT 1#3/0 Cu. GRD.
PANEL "SHA" 51A
100AT 3P
COLD WATER PIPE
GROUND ROD
75 KVA TRANSFORMER "TRCA" 480V. TO 120/208V.-3ø-4W
NEW U.G. 1"C.-4#6 Cu. THWN & 1#8 Cu. GRD. ± 80' V.D. = 0.36%
NEW U.G. 2"C.-4#3/0 Cu. THWN & 1#6 Cu. GRD. ± 10' V.D. = 0.09%
NEW U.G. (6) 2"C.O. WITH PULLCORD
PANEL "SLCA" 141A
200AT 3P
W.P. (VERIFY LOCATION)
STUB UP AT PHOTO VOLTAIC ARRAY (PV)
PARTIAL SINGLE LINE DIAGRAM "MSA"
NEW U.G. 1 1/4"C.-4#2 Cu. THWN & 1#8 Cu. GRD. ± 420' V.D. = 0.29%
NEW (1) U.G. 1 1/4"C.-3#1 & 1#8 Cu. GRD. THWN & (1) U.G. 1 1/4"C.O. SPARE ± 400' V.D. = 1.95%
PANEL "SLB" 13A
PANEL "SHB" 10A
75 KVA TRANSFORMER "TRCB" 480V. TO 120/208V.-3ø-4W
NEW U.G. 1"C.-4#6 Cu. THWN & 1#8 Cu. GRD. ± 15' V.D. = 0.08%
NEW U.G. 2"C.-4#3/0 Cu. THWN & 1#6 Cu. GRD. ± 10' V.D. = 0.08%
PANEL "SLCB" 125A
PARTIAL SINGLE LINE DIAGRAM "MSB"
BERGELECTRIC RECORD SET 02/19/04
12/19/02 BID SET
DALAN ENGINEERING, INC. ELECTRICAL ENGINEERS
8638 DARBY AVENUE NORTHRIDGE, CA. 91325 (818) 772-2220 (714) 771-4221 (805) 684-4944 FAX (818) 772-2239
Designed MM 12/19/02
Drawn FG 12/19/02
Checked MM 12/19/02
REV. NO. DATE BY APRVD DESCRIPTION
REVIEWED BY:
SCALE AS SHOWN
INLAND EMPIRE UTILITIES AGENCY A Municipal Water District
I.E.U.A. HEADQUARTERS PHASE 1
SINGLE LINE DIAGRAM
SHEET NO. 53 OF 61
01139.02
DRAWING NO. E-300
D4589-9


VOID ~ SEE KING & KNIGHT DRAWING # D-3308-E2
IN THE O-M MANUAL
SYMBOL LIST
BUBBLER COMPRESSOR CONTROL DIAGRAM
SINGLE LINE DIAGRAM
MCC-1
COMPRESSOR CONTROL DIAGRAM
TYPICAL FOR TWO
AS BUILT 6-20-78
NOT TO SCALE
CHINO BASIN MUNICIPAL WATER DISTRICT
MONTCLAIR PUMP STATION
ELECTRICAL PLAN
SINGLE LINE, CONTROLS
D 4398


SHEET KEYNOTES
A. ALL POWER AND CONTROL WIRING FROM THE MCC TO EXISTING LOADS WILL BE REPLACED. EXTEND EXISTING CONDUITS TO NEW MCC AS NECESSARY.
B. REUSE EXISTING CONDUIT AND WIRING.
C. RE-LOCATE EXISTING ACOPIAN POWER SUPPLY TO THIS LOCATION FROM EXISTING MCC.
D. MCC AND EQUIPMENT INTERNAL TO MCC ARE NEW. ALL OTHER EQUIPMENT IS EXISTING.
PMCC-4001 MCC
MOTOR CONTROL CENTER OPERATION ROOM
(NEW MCC FOR PHILADELPHIA PUMP STATION) N.T.S.
EXISTING MCC PAD
480V, 800A, 3 PHASE, 3 WIRE, 42KAIC
EXIST 1000A AUTO TRANSFER SWITCH
CAT MODEL 3306 EMERGENCY GENERATOR 313KVA, 250KW, 376A, 480V, 60HZ, 3PH
LOCATED IN M.C.C.
INLAND EMPIRE UTILITIES AGENCY* *A Municipal Water District
NRWS PHILADELPHIA PUMP SYSTEM UPGRADES
EQUIPMENT ELEVATIONS & SINGLE LINE DIAGRAMS
E-2
22 OF 33
MWH Pasadena California
03/08/07


MAIN SWITCHBOARD SM2358
1200A, 480Y/277V, 3ø, 4W, 65KAIC, NEMA 1 ENCLOSURE
AUTOMATIC TRANSFER SWITCH
600A, 3ø, 3P, 65KAIC NEMA 1 ENCLOSURE
SWITCHBOARD SWB2360
800A, 480V, 3ø, 3W, 65KAIC NEMA 1 ENCLOSURE
SWITCHBOARD SWB2362
800A, 480V, 3ø, 3W, 65KAIC NEMA 1 ENCLOSURE
UNDERGROUND PULL SECTION
METERING/MAIN SECTION
BREAKER STATUS TO PLC
POWER MONITOR
COMM LINK TO PLC
ATS IN NORMAL AND STANDBY TO PLC
GROUND BUS
FROM SCE
SCE TRANSFORMER 12KV-480Y/277V, 3ø, 4W
#4/0 BC GROUND LOOP LOCATED 30" BELOW GRADE
GROUND ROD (SEE PLANS FOR QTY)
STANDBY POWER SWITCHBOARD SWB2363
1200A,480Y/277V 3ø, 4W, 65KAIC NEMA 1 ENCLOSURE
KEY INTERLOCKED
FUTURE RP-4 FEEDER TRANSFORMER 750 KVA 12.47KV-480Y/277V 3ø,4W TLT2366
500KW 480Y/277, 3ø, 4W STANDBY GENERATOR GSB2367
INFLUENT PUMP NO. 1 PUI2301 156 FLA
INFLUENT PUMP NO. 3 PUI2321 65 FLA
ELECTRICAL ROOM AIR HANDLING UNIT NO. 1 5 TON
FUTURE ODOR CONTROL SYSTEM M-XXX
INFLUENT PUMP NO. 2 PUI2311 156 FLA
INFLUENT PUMP NO. 4 PUI2331 65 FLA
ELECTRICAL ROOM AIR HANDLING UNIT NO. 2 5 TON
INFLUENT PUMP NO. 5 PUI2341 156 FLA (FUTURE)
AUTOMATIC TRANSFER SWITCH 480V, 100A, 3ø, 3P, 65KAIC NEMA 1
SINGLE LINE DIAGRAM 1
SEAL WATER PUMP #1
SEAL WATER PUMP #2
15KVA 480V-208Y/120V 3ø, 4W
LOAD CALCULATION (25 MGD)
SM2358 ELEVATION 2
ATS2359 AND ATS2361 ELEVATION 3
SWB2360, SWB2362, AND SWBD2363 ELEVATION 4
TYPICAL 75HP AND 150HP VFD ELEVATION 5
NOTES:
(1) PROVIDE CIRCUIT BREAKER WITH REPLACEABLE TRIP PLUG
(2) MOTOR WILL BE REPLACED WITH A 125-HP MOTOR IN THE FUTURE TO ACCOMMODATE 25 MGD.
(3) SEE DWG E-6 FOR CONDUIT SCHEDULE.
(4) ALL INSTRUMENT AND EQUIPMENT TAGS HAVE AN AREA PREFIX. SEE DWG I-2 FOR TAG FORMATTING
(5) COORDINATE CIRCUIT BREAKER RATING, FUSE RATING, AND CONDUCTOR SIZE WITH AIR HANDLING UNIT MANUFACTURER.
(6) INTERCEPT EXISTING RP-4 4" CONDUIT PROVIDED BY OTHERS AND EXTEND TO TRANSFORMER TLT2366
CDM Camp Dresser & McKee Inc.
9220 Cleveland Avenue, Suite 100
Rancho Cucamonga, California 91730
Tel: (909) 579-3500
Fax: (909) 980-5185
DIGALERT
DIAL BEFORE YOU DIG
TWO WORKING DAYS BEFORE YOU DIG
TOLL FREE 1-800-227-2600
SHOULD CONSTRUCTION OF THE REQUIRED IMPROVEMENTS NOT COMMENCE WITHIN TWO YEARS OF THE DATE OF APPROVAL SHOWN HEREON AND CARRIED FORTH IN A DILIGENT MANNER, THE CITY ENGINEER MAY REQUIRE REVISIONS TO THE PLANS TO BRING THEM INTO CONFORMANCE WITH CONDITIONS AND STANDARDS IN EFFECT.
CITY OF FONTANA, CALIFORNIA
SAN BERNARDINO AVENUE LIFT STATION
SINGLE LINE DIAGRAM AND EQUIPMENT ELEVATIONS
FEBRUARY 2007
E-2

Appendix D: RP-1 Yard Piping

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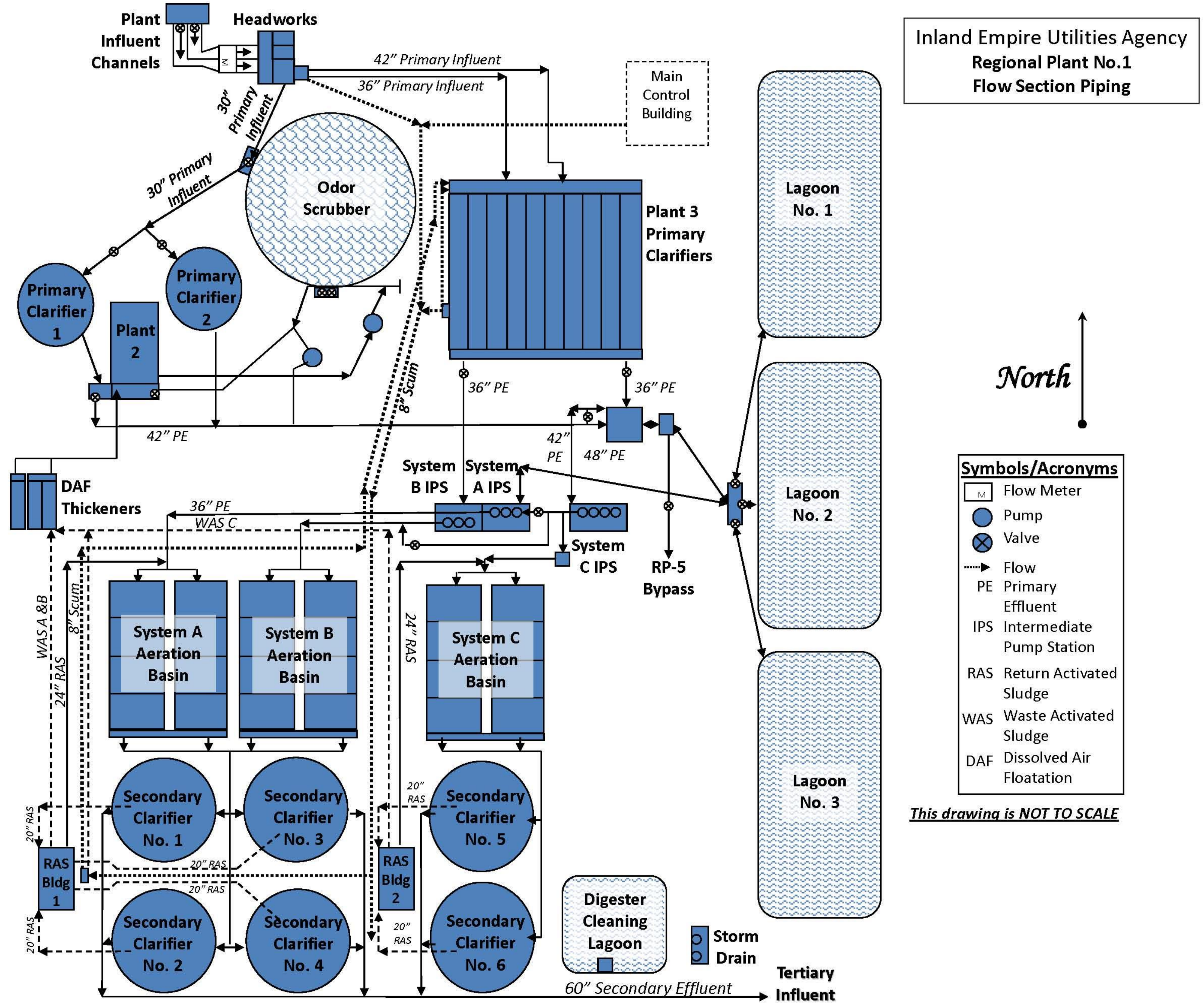
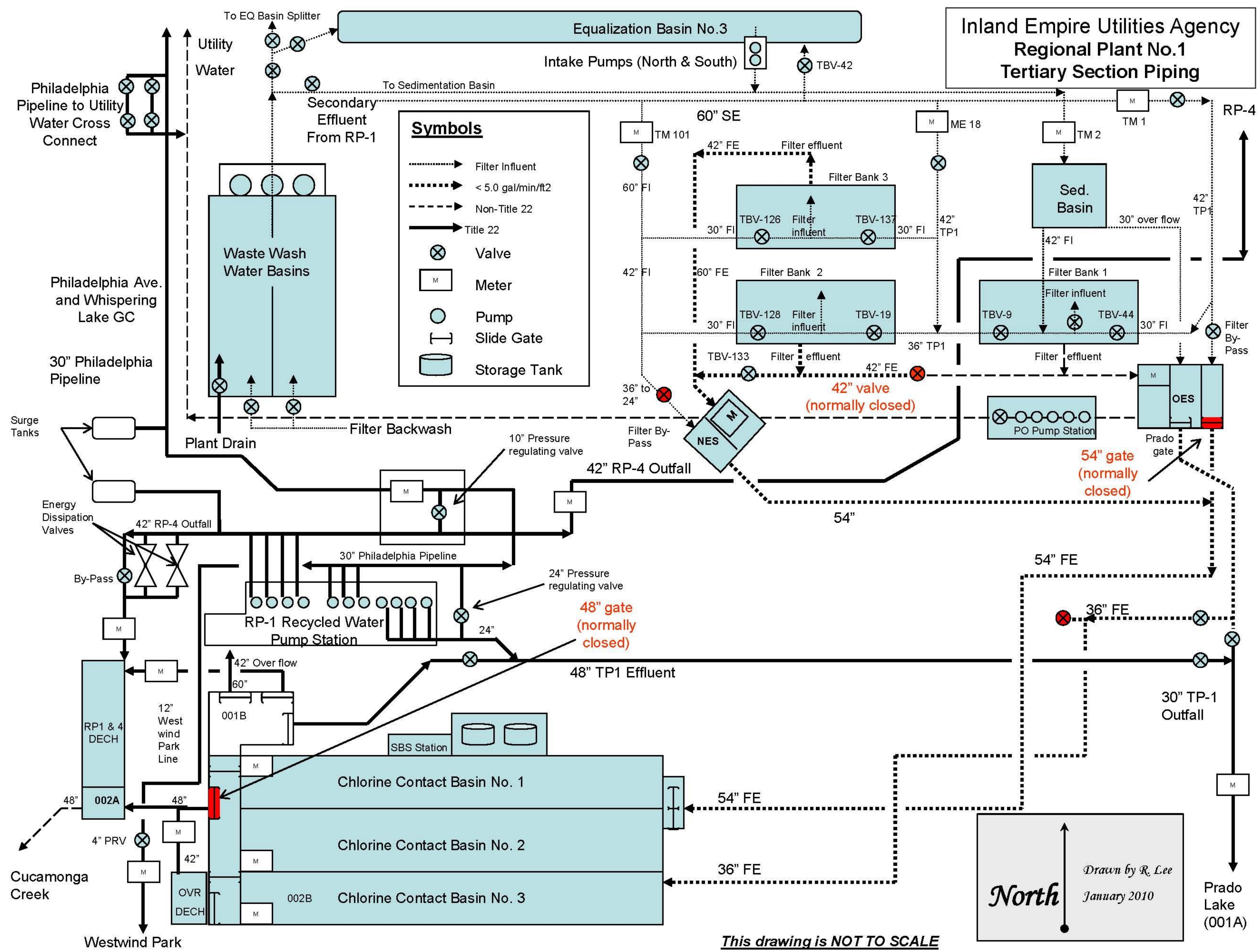
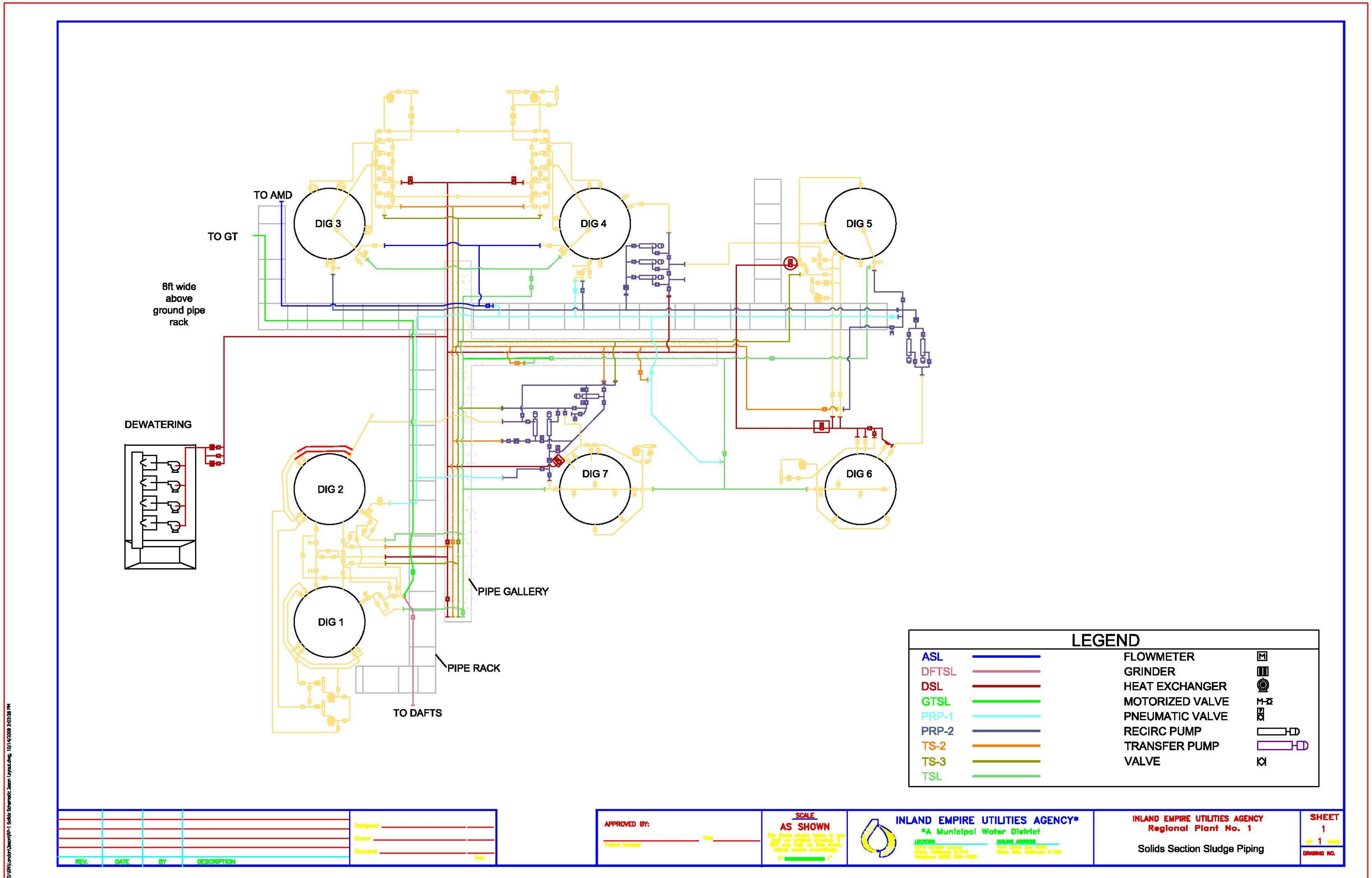

Inland Empire Utilities Agency
Regional Plant No.1
Flow Section Piping
Plant Influent Channels
Headworks
42" Primary Influent
36" Primary Influent
Main Control Building
30" Primary Influent
30" Primary Influent
Odor Scrubber
Plant 3 Primary Clarifiers
Lagoon No. 1
Lagoon No. 2
Lagoon No. 3
Primary Clarifier 1
Primary Clarifier 2
Plant 2
8" Scum
36" PE
36" PE
42" PE
42" PE
48" PE
North
DAF Thickeners
System B IPS
System A IPS
System C IPS
RP-5 Bypass
36" PE
WAS C
WAS A &B
8" Scum
24" RAS
24" RAS
System A Aeration Basin
System B Aeration Basin
System C Aeration Basin
Secondary Clarifier No. 1
Secondary Clarifier No. 2
Secondary Clarifier No. 3
Secondary Clarifier No. 4
Secondary Clarifier No. 5
Secondary Clarifier No. 6
20" RAS
RAS Bldg 1
RAS Bldg 2
Digester Cleaning Lagoon
Storm Drain
60" Secondary Effluent
Tertiary Influent
Symbols/Acronyms
Flow Meter
Pump
Valve
Flow
PE Primary Effluent
IPS Intermediate Pump Station
RAS Return Activated Sludge
WAS Waste Activated Sludge
DAF Dissolved Air Floatation
This drawing is NOT TO SCALE


Inland Empire Utilities Agency
Regional Plant No.1
Tertiary Section Piping
Equalization Basin No.3
Intake Pumps (North & South)
TBV-42
To EQ Basin Splitter
Utility
Water
To Sedimentation Basin
Secondary Effluent From RP-1
Philadelphia Pipeline to Utility Water Cross Connect
Symbols
Filter Influent
< 5.0 gal/min/ft2
Non-Title 22
Title 22
Valve
Meter
Pump
Slide Gate
Storage Tank
Waste Wash Water Basins
Philadelphia Ave. and Whispering Lake GC
30" Philadelphia Pipeline
Surge Tanks
Plant Drain
Filter Backwash
60" SE
TM 101
ME 18
TM 2
TM 1
RP-4
Filter effluent
Filter Bank 3
Filter Bank 2
Filter Bank 1
Sed. Basin
30" over flow
42" FE
60" FI
42" FI
60" FE
30" FI
TBV-126
TBV-137
TBV-128
TBV-19
TBV-9
TBV-44
TBV-133
Filter influent
Filter effluent
42" TP1
36" TP1
36" to 24"
42" valve (normally closed)
Filter By-Pass
NES
PO Pump Station
OES
Prado gate
54" gate (normally closed)
10" Pressure regulating valve
42" RP-4 Outfall
54"
54" FE
36" FE
Energy Dissipation Valves
By-Pass
30" Philadelphia Pipeline
24" Pressure regulating valve
RP-1 Recycled Water Pump Station
48" gate (normally closed)
24"
42" Over flow
60"
001B
48" TP1 Effluent
30" TP-1 Outfall
RP1 & 4 DECH
12" West wind Park Line
SBS Station
002A
48"
4" PRV
42"
OVR DECH
002B
Chlorine Contact Basin No. 1
Chlorine Contact Basin No. 2
Chlorine Contact Basin No. 3
54" FE
36" FE
Cucamonga Creek
Westwind Park
North
Drawn by R. Lee
January 2010
Prado Lake (001A)
This drawing is NOT TO SCALE


TO AMD
TO GT
8ft wide above ground pipe rack
DIG 3
DIG 4
DIG 5
DIG 7
DIG 6
DIG 2
DIG 1
DEWATERING
PIPE GALLERY
PIPE RACK
TO DAFTS
LEGEND
ASL
DFTSL
DSL
GTSL
PRP-1
PRP-2
TS-2
TS-3
TSL
FLOWMETER
GRINDER
HEAT EXCHANGER
MOTORIZED VALVE
PNEUMATIC VALVE
RECIRC PUMP
TRANSFER PUMP
VALVE
REV.
DATE
BY
DESCRIPTION
APPROVED BY:
SCALE
AS SHOWN
INLAND EMPIRE UTILITIES AGENCY*
*A Municipal Water District
INLAND EMPIRE UTILITIES AGENCY
Regional Plant No. 1
Solids Section Sludge Piping
SHEET
1
1
DRAWING NO.