Inland Empire Utilities Agency

Asset Management Plan

Fiscal Year 2014/15

Inland Empire Utilities Agency

A MUNICIPAL WATER DISTRICT

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 the first developed at the Agency. It is intended for this plan 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, asset valuation (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 2014. 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. Regional Water Recycling Plant No. 1 (RP-1)
2. Regional Water Recycling Plant No. 2 (RP-2)
3. Carbon Canyon Water Recycling Facility (CCWRF)
4. Regional Water Recycling Plant No. 4 (RP-4)
5. Regional Water Recycling Plant No. 5 (RP-5)
6. Recycled Water Distribution (RW) & Ground Water Recharge (GWR) Systems
7. Inland Empire Regional Composting Facility (IERCF)
8. Agency Lift Stations (LS)
9. Regional Conveyance System (RC)
10. Agency Laboratory (Lab)
11. Agency Headquarters (HQ)
12. 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.

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.

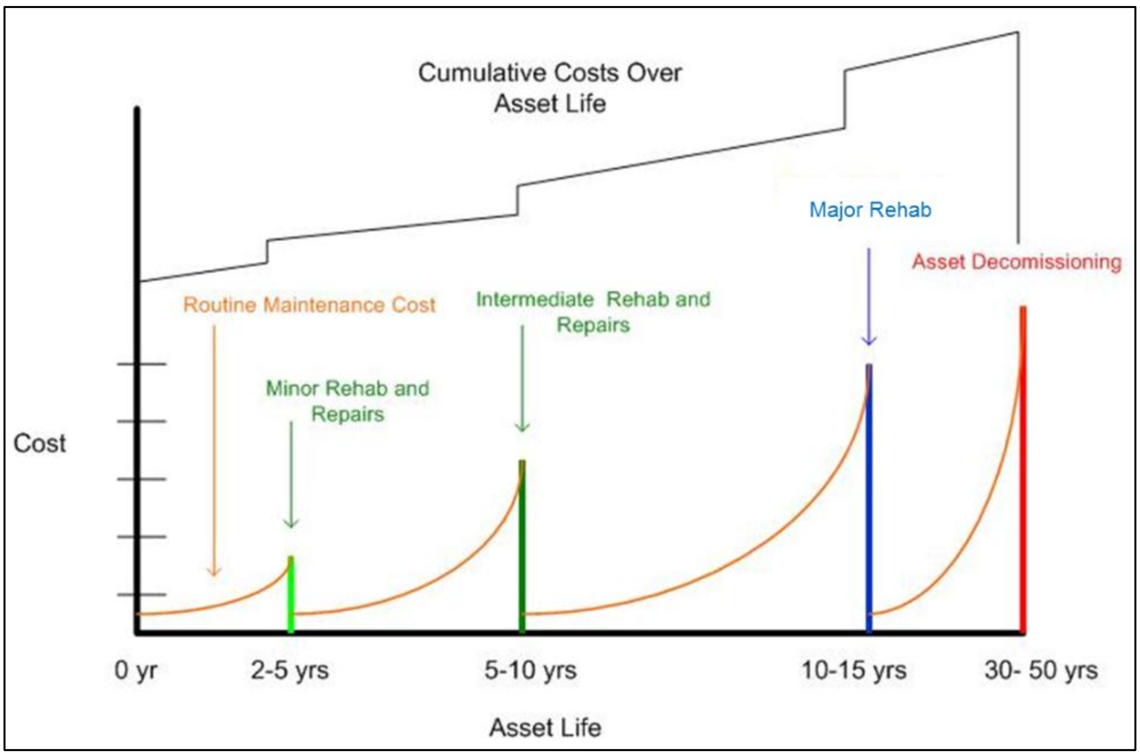

Figure 1-1: Lifecycle Cost

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.

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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.

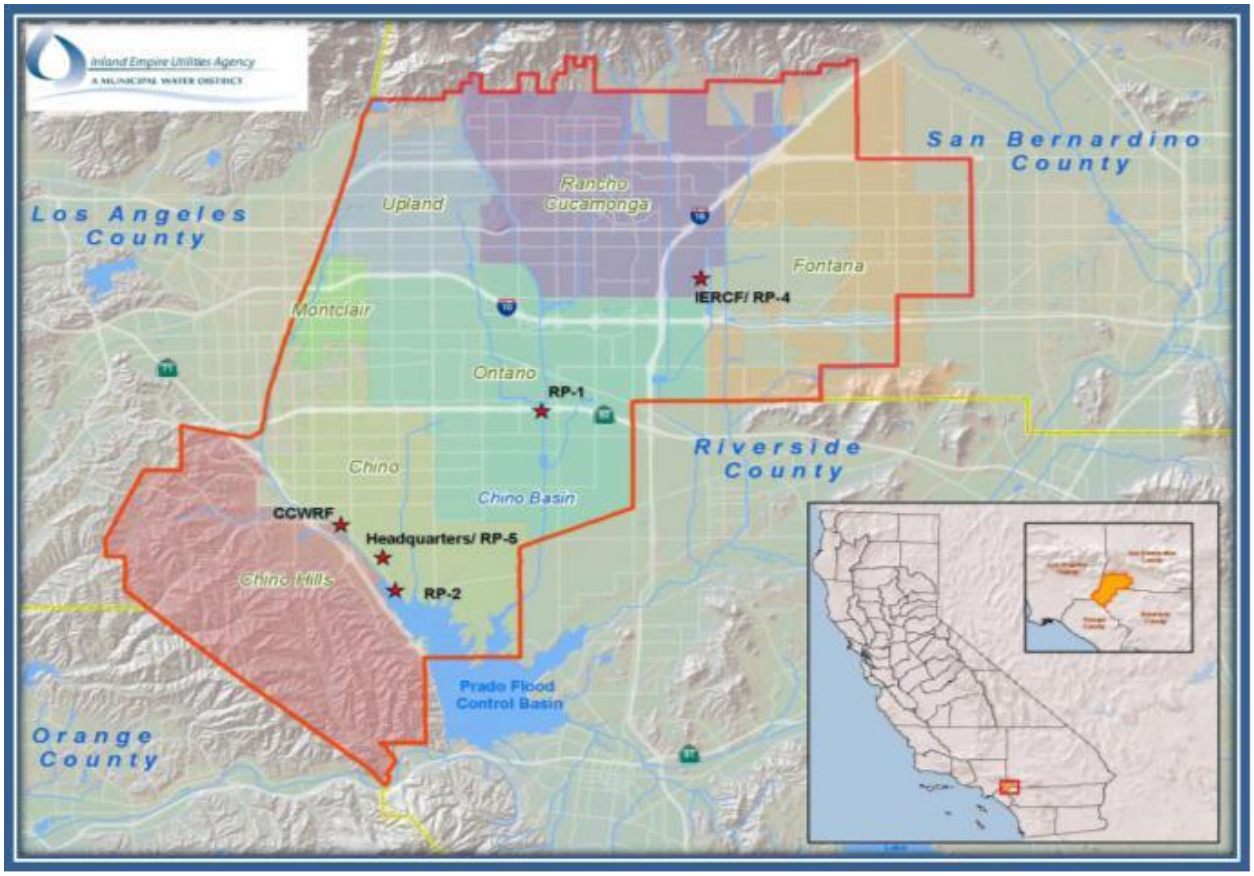

Figure 2-1: Agency Service Area

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 have 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 reinstate their credit rating to AAA by FY 202017/18 to reduce borrowing costs anticipated for expanding and improving existing facilities required to meet future growth in their service area.

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 enhance or promote 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.

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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

Table 4-1 shows the current flows being treated at each of the Agency's RWRPs.

Table 4-1: Average Annual Flow (Fiscal Year 2012/13)

AGENCY	RP-1	RP-4	RP-5	CCWRF	TOTAL
Chino	0.1		1.9	2.1	4.1
Chino Hills			3.8	2.0	5.8
Ontario	8.9		4.2		13.1
Montclair	0.2			2.1	2.3
Upland	4.1			1.0	5.0
Fontana	6.9	5.5			12.4
CVWD	7.7	4.6			12.3
TOTAL	**27.9**	**10.0**	**9.9**	**7.0**	**54.9**

Note: Table 4-1 does not include recycle flows.

Figure 4-1 illustrates the general wastewater flow pattern within the Agency service area. For FY 2012/13, the average raw wastewater flow treated was 54.9 MGD. Since FY 2006/07, the Agency's wastewater flows have declined by about 10 percent (similar to other local agencies). However, even though wastewater flows declined, the Agency has been able to increase the amount of recycled water supplied to users. The Agency has done so by using the San Bernardino Avenue lift station and the Montclair lift station to route additional raw wastewater to the recycling plants in the Northern Service Area, where the system has been expanded and where groundwater recharge basins are located.

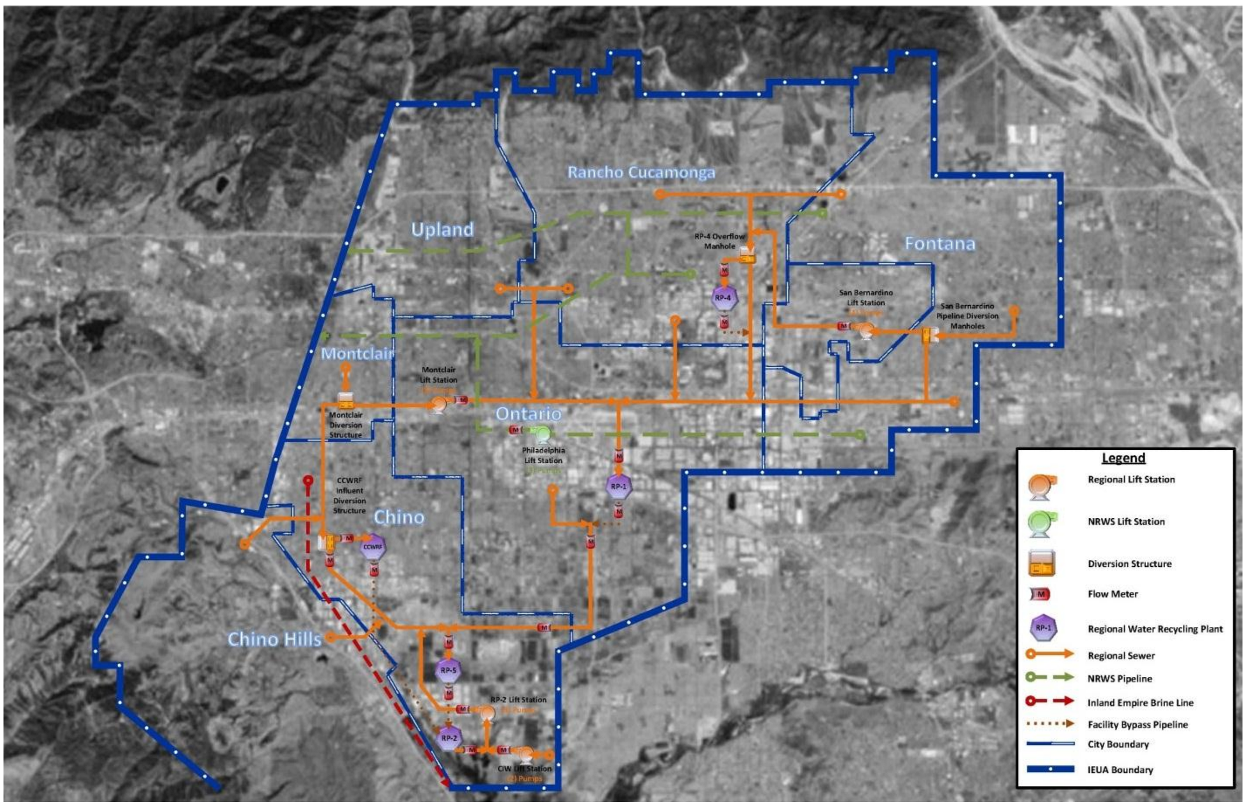

Figure 4-1: General Wastewater Flow Pattern

The Agency's historical wastewater-flow trend is shown below in Figure 4-2. This figure depicts the raw wastewater from each RWRP's tributary area and the total wastewater for all facilities combined.

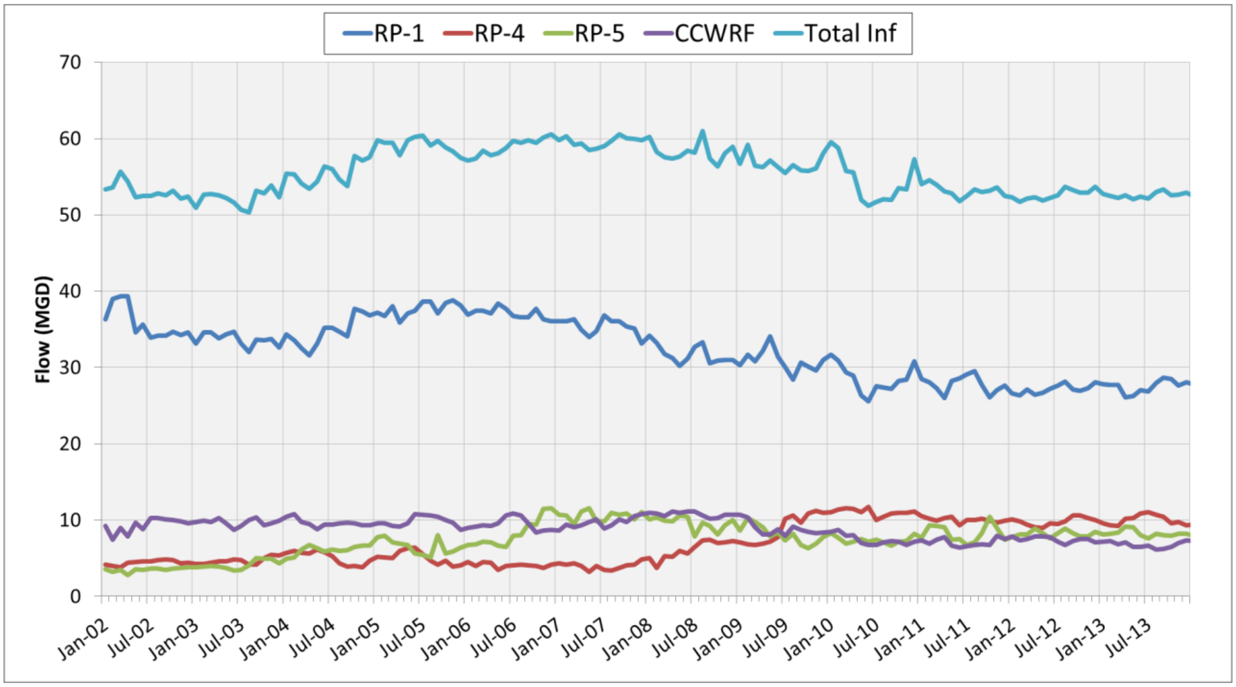

Figure 4-2: Regional Plant Wastewater Flow History

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5. State of the Assets Summary

5.1. Asset Valuation

The current replacement and depreciated values for Agency assets are summarized in Table 5-1.

Table 5-1: Agency Replacement and Depreciated Values

Asset Group	Acquisition Value	Book Value (Depreciated Value)	Book Value / Replacement Value
Land	$ 14,000,000	$ 14,000,000	100%
Land Improvements	$ 19,000,000	$ 11,100,000	58%
Collection, Outfall & Transfer Lines	$ 120,800,000	$ 59,800,000	50%
Interceptors, Tie-Ins	$ 29,100,000	$ 21,000,000	72%
Recycled Water System	$ 96,600,000	$ 85,300,000	88%
Wells	$ 5,400,000	$ 4,800,000	89%
Reservoirs, Basins, Ponds	$ 104,600,000	$ 83,400,000	80%
Treatment Plants, Pump Stations	$ 216,700,000	$ 122,900,000	57%
Plant Office Buildings	$ 30,000,000	$ 20,300,000	68%
Office Facilities	$ 12,100,000	$ 9,800,000	81%
Equipment	$ 130,100,000	$ 65,600,000	50%
Office Furniture and Fixtures	$ 2,800,000	$ 300,000	11%
Auto and Trucks	$ 3,300,000	$ 200,000	6%
Computer Software	$ 7,900,000	$ 3,800,000	48%
CSLAC-Facility & Capacity Rights	$ 38,200,000	$ 23,800,000	62%
SAWPA-Capacity Rights	$ 12,500,000	$ 6,700,000	54%
MWD Connections	$ 200,000	$ -	0%
Organizational Costs	$ 1,800,000	$ 1,300,000	72%
Total	**$ 845,100,000**	**$ 534,100,000**	**63%**

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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 FY 2011/12 LRPF, 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, with a complete robust and dynamic LRPF model anticipated in summer 2014. 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.

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

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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. Regional Water Recycling Plant No. 1 (RP-1)
2. Regional Water Recycling Plant No. 2 (RP-2)
3. Carbon Canyon Water Recycling Facility (CCWRF)
4. Regional Water Recycling Plant No. 4 (RP-4)
5. Regional Water Recycling Plant No. 5 (RP-5)
6. Recycled Water Distribution (RW) & Ground Water Recharge (GWR) Systems
7. Inland Empire Regional Composting Facility (IERCF)
8. Agency Lift Stations (LS)
9. Regional Conveyance System (RC)
10. Agency Laboratory (Lab)
11. Agency Headquarters (HQ)
12. 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

For Recycled Water & Ground Water Recharge, 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:

- **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.

- **Subsystem Summaries** – Describes the subsystem of a given system on a single 11 x 17-inch sheet divided into the following six sections:

    - <u>Asset Profile</u> – Describes the assets and their primary functions.
    - <u>Capacity Profile</u> – Describes the key capacity-design values for assets in terms of average flow requirements.
    - <u>Asset Ratings</u> – 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.
    - <u>Key Issues</u> – Lists treatment process and equipment issues (deficiencies) based on performance data and Operations and Maintenance Department Staff knowledge and f indicates which existing project will address the issue. If an issue is not being addressed by existing project, then the need for a potential project will be noted within the key issue description.
    - <u>History of Select Assets</u> – Provides dates of past capital improvement project activity and of planned or completed condition-assessment reports.
    - <u>Potential Projects</u> – 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 Conveyance System could be only 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 a table 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.

Table 7-1: Agency-wide Project Summary

#	Project Number[1]	Project Name	Project Description	Project Type[2]	Fund[3]	Fiscal Year Budget (Dollars)										
						2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	Ten-Year Total
1	EN17005	Septage Dump System	Provide septage dump system at the most appropriate location within the Agency.	CC	GG	0	0	100,000	800,000	0	0	0	0	0	0	900,000
2	PA15007	Facility Access Improvements	Provide FOB access where keys and cipher locks are currently employed.	OM	GG	300,000	300,000	300,000	0	0	0	0	0	0	0	900,000
3	PA15008	Major Asset Rehab/Replace	Agency-wide annual R&R of major assets (buildings, vehicles, etc.).	OM	GG	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	2,000,000
4	FP10200	Financial Planning Forecast GG Fund	Placeholder for ERP Improvements per Kanes 3/3/14.	RP	GG	298,000	298,000	298,000	310,000	400,000	250,000	250,000	250,000	250,000	250,000	2,854,000
5	EN12020	Chino Creek Invert Repair	Repair of Chino Creek invert near CCWRF where differential settling occurred.	RP	RC	288,000	0	0	0	0	0	0	0	0	0	288,000
6	EN13056	Agency-wide HVAC Improvements – Package No. 2	Agency-wide HVAC Improvements – Package No. 2.	CC	RC	600,000	300,000	0	0	0	0	0	0	0	0	900,000
7	EN14006	Misc RC Constr & Emergency Proj FY13/14	Miscellaneous emergency construction under RC fund.	CC	RC	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	2,500,000
8	EN14009	CM Misc RC Constr & Emergency Proj FY13/14	Construction management: miscellaneous emergency construction under RC fund.	CC	RC	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	2,500,000
9	EP14004	Cl2 Residual Analyzer Replacement	Maintenance project to replace all the chlorine analyzers Agency-wide that are no longer being supported by the manufacturer.	EQ	RC	160,000	0	0	0	0	0	0	0	0	0	160,000
10	EN17003	Aeration System Improvements	Agency-wide aeration system improvements.	CC	RC	0	0	250,000	3,000,000	3,000,000	0	0	0	0	0	6,250,000
11	SR12001	Agency-wide Security Equipment Upgrade	Agency-wide security equipment upgrade.	EQ	RC	50,000	50,000	0	0	0	0	0	0	0	0	100,000
12	PA15005	Biofilter Media Replacement	Agency-wide annual biofilter media replacement.	OM	RO	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	2,000,000
13	PA15004	Tertiary Facility Rehab	Agency-wide annual rehab to the tertiary facilities (e.g., sedimentation basin, filters, and chlorine contact basins)	OM	RO	100,000	100,000	100,000	1,500,000	1,500,000	100,000	100,000	100,000	100,000	100,000	3,800,000
14	PA15006	Aeration Systems Rehab	Agency-wide annual rehab (e.g., diffuser rehab) of aeration systems.	OM	RO	300,000	300,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	2,200,000
15	EP15002	Major Equipment Rehab/Replace	Agency-wide annual R&R of major equipment (pumps, heat exchangers, compressors, etc.).	EQ	RO	700,000	500,000	400,000	400,000	400,000	400,000	400,000	400,000	400,000	400,000	4,400,000

#	Project Number[1]	Project Name	Project Description	Project Type[2]	Fund[3]	Fiscal Year Budget (Dollars)										
						2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	Ten-Year Total
16	PA15002	Agency-wide Coatings and Paving	Agency-wide annual maintenance for coatings and paving.	OM	GG	200,000	200,000	200,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	1,300,000
17	EN17004	Energy Efficiency Improvements	Agency-wide upgrades to the lighting systems and process equipment systems to improve efficiency. Start design in FY2018/19.	CC	RO	0	100,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	1,700,000
18	PA15001	Underground Piping Rehab	Annual underground piping rehab Agency-wide within facilities.	OM	RO	500,000	500,000	500,000	500,000	1,000,000	400,000	400,000	400,000	400,000	400,000	5,000,000
19	EN14024	CM Misc RO Constr & Emergency Proj FY13/14	Construction management: miscellaneous emergency construction under RO fund.	CC	RO	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	2,500,000
20	EN14026	Misc RO O&M Emergency Proj FY13/14	Miscellaneous emergency O&M work under RO fund.	OM	RO	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	2,500,000
21	PA15003	Agency-wide Annual Rehab of Clarifiers	Agency-wide annual rehab of clarifiers.	OM	RO	350,000	350,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	1,500,000
22	EP15001	RP1/RP2 Digester Cleaning Project	Removal of the solids from RP-2 Digester #1 or RP-1 Digester #4, perform structural analysis, repair/modify as needed and replace valves as required.	OM	RO	420,000	0	0	0	0	0	0	0	0	0	420,000
23	EN15026	CM Misc RO Constr & Emergency Proj FY2014/15	Fund unforeseen Wastewater Capital Improvement Fund projects that require immediate attention.	CC	RO	250,000	0	0	0	0	0	0	0	0	0	250,000
24	EN15032	Agency-Wide HVAC Improvements – Package No. 3	Evaluate electrical and control building HVAC systems and provide solutions/upgrades for the RP-1 Chemical Storage Warehouse, RP-5 Control Room, and RP-5 Power Center No.3.	CC	RC	100,000	950,000	150,000	0	0	0	0	0	0	0	1,200,000
25	EN15027	Misc RO Constr & Emergency Proj FY2014/15	Fund unforeseen Wastewater Capital Improvement Fund projects that require immediate attention.	CC	RO	250,000	0	0	0	0	0	0	0	0	0	
26	EN15028	Misc RO O&M Emergency Proj FY2014/15	Fund unforeseen Wastewater Capital Improvement Fund projects (O&M) that require immediate action.	OM	RO	250,000	0	0	0	0	0	0	0	0	0	

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

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

Regional Water Recycling Plant No. 1

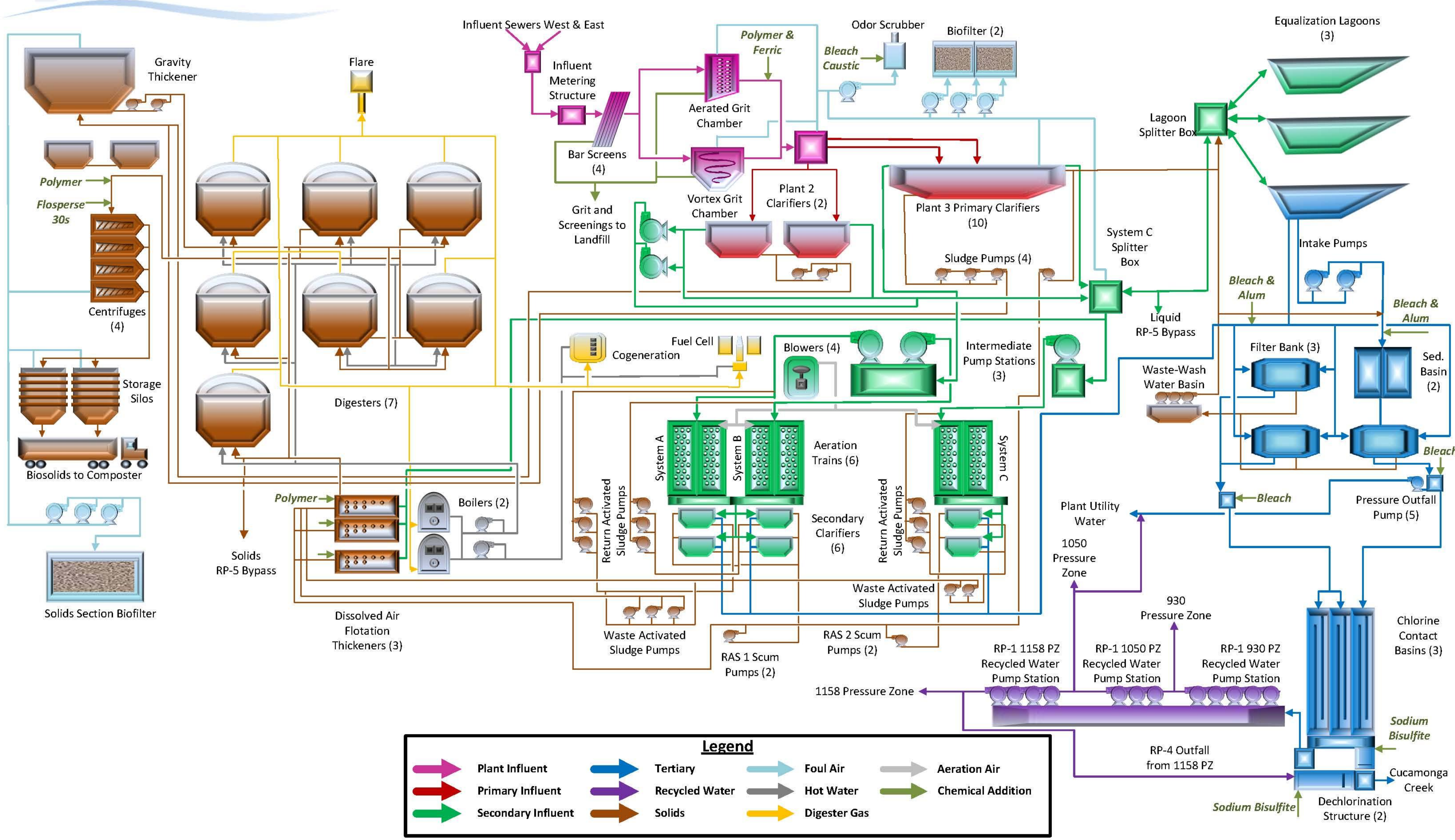

Figure 7-1: Regional Water Recycling Plant No. 1 (RP-1) – Schematic

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

#	Project Number[1]	Project Name	Project Description	Project Type[2]	Fund[3]	Fiscal Year Budget (Dollars)										
						2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	Ten-Year Total
1	EN11039	TP-1 Disinfection Pump Improvements	Engineering project to upgrade dosing facilities at OES and NES to allow full post filtration chlorination.	RP	RC	95,000	225,000	0	0	0	0	0	0	0	0	320,000
2	EN12022	RP-1 Aeration Ducting Rehab	Project to repair leaks in aeration ducting system.	RP	RC	25,000	0	0	0	0	0	0	0	0	0	25,000
3	EN13046	RP-1 Flare System Improvements	Project to upgrade the flare control system and increase flare capacity. Evaluation being done to determine design intent.	RP	RC	0	0	1,550,000	1,850,000	0	0	0	0	0	0	3,400,000
4	EN14019	RP-1 Headworks Rehab (aka Headworks Gate Replacement)	Engineering project to comprehensively rehab and upgrade the preliminary treatment process. Start design in FY2018/19.	CC	RC	0	0	210,000	1,500,000	6,000,000	2,800,000	0	0	0	0	10,510,000
5	EN14020	RP-1 Sludge Thickening Upgrades	Project to upgrade the sludge thickening processes for primary and secondary sludge. Start design in FY2018/19.	CC	RC	0	0	0	0	240,000	1,250,000	3,478,000	3,478,000	0	0	8,446,000
6	EN15019	RP-1 Odor Control Improvements	Odor control improvements (clarifier covers, foul air equipment, etc.).	CC	RC	100,000	550,000	0	0	0	0	0	0	0	0	650,000
7	EN19007	RP-1 Flow Equalization Upgrade and Odor Control	Scope will be determined by findings of Master Plan update. Potential project to address odor related to equalizing primary effluent.	CC	RC	0	0	0	0	1,000,000	0	0	0	0	0	1,000,000
8	EN15020	RP-1 Plant 3 Primary Scum Well Upgrade	Potential project to address scum pumping capacity issues, as well as evaluate MCC in primary pumping gallery.	CC	RC	75,000	325,000	0	0	0	0	0	0	0	0	400,000
9	EN18004	RP-1 IPS System Improvements	Project to address deficiencies in system (e.g., replace eddy clutches with VFDs).	CC	RC	0	0	0	250,000	750,000	0	0	0	0	0	1,000,000
10	EN20006	RP-1 Digester Mixing Upgrade	Potential engineering project to upgrade the digester mixing systems. Start design in FY2019/20.	CC	RC	0	0	0	0	0	250,000	500,000	500,000	500,000	500,000	2,250,000
11	EN15012	RP-1 East Primary Effluent Pipe Rehab	Rehab of the east primary effluent piping between the rectangular primary clarifiers and the Intermediate Pump Station wet well.	CC	RO	600,000	150,000	0	0	0	0	0	0	0	0	750,000
12	EN15013	RP-1 TWAS and Primary Effluent Piping Replacement 2014	Failures in the TWAS and primary effluent piping require pipe to be replaced.	CC	RO	400,000	100,000	0	0	0	0	0	0	0	0	500,000

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

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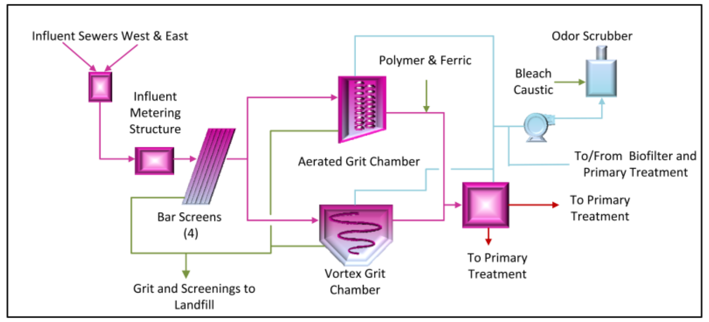
Asset Management System Summary – RP-1

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.

Screening Equipment
Gates divert flow to six channels, four mechanical climber bar screens, one manual bar screen, and one bypass channel. The 5/8-inch-spaced bar screens hold large debris from flowing-to-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 is 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	
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	3	2	3	3
Screening Equipment	3	2	3	3
Aerated Grit System	3	3	4	3
Vortex Grit System	3	3	4	5
Grit Washing/Disposal System	3	3	3	3
Screening Conveyance/Disposal System	4	5	3	5
Ferric Chloride System	3	3	3	3
Polymer System	3	3	3	3
Headworks Splitter Box	3	5	3	3
Odor Scrubber	3	3	3	3

* Ratings as defined in Appendix A

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. A project is being planned by Maintenance under EP14002 to replace the isolation gates.

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. Project EN14019 will replace the broken and inoperable gates.

Aerated Grit System
The AGC allows large amounts of grit to pass through to downstream processes. Many of the gates are broken and inoperable. 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 clogs frequently when the chamber is in operation. A potential maintenance project will rehab this system.

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. A potential maintenance project will rehab this system.

Screenings Conveyance/Disposal System
The conveyor equipment is corroded and has limited accessibility for cleaning and repair. The compactor welds and hoses fail regularly (3 to4 times per year). maintenance project EP14002 will replace the screenings conveyor and compactor in 2014.

Ferric Chloride System
The ferric chloride system operates effectively, but the equipment is approaching the end of its useful life. Project EN14019 will rehab this system.

Polymer System
This system will be rehabbed by Project EP14002 or EN14019.

Headworks Splitter Box
Many of the gates are broken and inoperable. Project EN14019 will replace these gates.

Odor Scrubber
The odor scrubber is a viable alternative if the primary section biofilter needs to be taken offline. Project EN14019 will rehab this system.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Influent Channel and Metering Station	1977 1987	Planned 2014
Screening Equipment	1977 1987	Planned 2014
Aerated Grit System	1987	Planned 2014
Vortex Grit System	1987	
Grit Washing/Disposal System	1977 1987 2009	
Screening Conveyance/Disposal System	1977 1987	
Ferric Chloride System	1987 1992	
Polymer System		
Headworks Splitter Box	1977	Planned 2014
Odor Scrubber	1996	Planned 2014

Table 4 Potential Projects

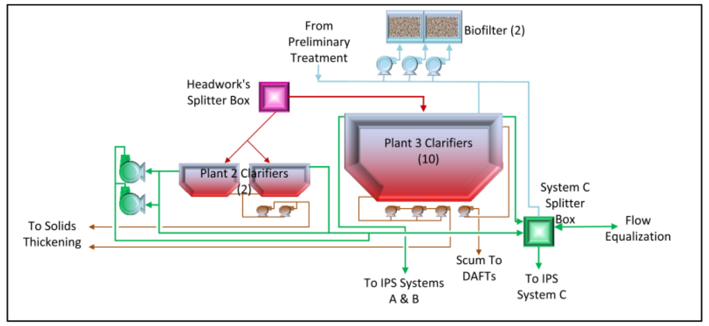
System	Project Name	Project Description
Vortex Grit Systemr	RP1 Vortex Grit Chamber Rehab	Rehab and upgrade the vortex grit system.

System Summary Continued on Next Page

Asset Management System Summary – RP-1

Primary Treatment Process

1. Asset Profile



__Plant 3__
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 floatables 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 bladder 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.

__Plant 2__
Primary Clarifiers
Flow from the hheadworks 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 floatables 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.

Biofilter
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
__Plant 3__	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
__Plant 2__	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	
Biofilter 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
__Plant 3__				
Influent Channel	3	3	3	3
Primary Clarifiers	3	1	3	3
Effluent Channel	4	3	3	3
Sludge Pumping System	3	3	3	3
Scum Pumping System	3	4	3	3
__Plant 2__				
Primary Clarifiers	3	3	3	3
Sludge Pumping System	3	3	3	3
Trickling Filter Pumps	3	3	4	3
Biofilter	2	3	3	3

* Ratings as defined in Appendix A

4. Key Issues

__Plant 3__
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. The upgrade of the scum removal system, through Project EN08023.05 (2014 completion), will provide an opportunity for the scum gates to be opened so that the floatable solids can be removed by the primary's scum removal system.

Primary Clarifiers
Small pieces of the chain/flight system break requiring significant maintenance activities to repair. Primary clarifiers 1 through 7 are currently being rehabbed through Project EN08023.05.

Effluent Channel
The effluent channel is currently in the process of being recoated through Project EN08023.05.The bladder valves leading from the effluent channel to the intermediate pump stations have failed and do not divert flow as originally designed. Recent evaluations of underground piping to the intermediate pump stations have indicated extensive corrosion. Project EN14052 will replace underground piping from the effluent channel to the intermediate pump stations. The other underground piping is likely in a similar condition and will require repairs.

Sludge Pumping System
No issues require special attention.

Scum 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 are required to be vactored regularly. The scum collection system is currently being retrofitted to a tipping trough under project EN08023.05; however, the scum accumulation in the wet well is not being addressed; a future project is required.
__Plant 2__
Primary Clarifiers
The clarifiers are not covered to control odors and have a limited capacity. The current flow meter for the system is a temporary strap-on flow meter placed after the original flow meter and headwork's isolation gate failed. Because of the limited use of these clarifiers, the cost-effectiveness of a rehab will have to be evaluated.

Solids Pumping System
No issues require special attention.

Trickling Filter Pumps
No critical issues. 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.

Table 3 History of Select Assets

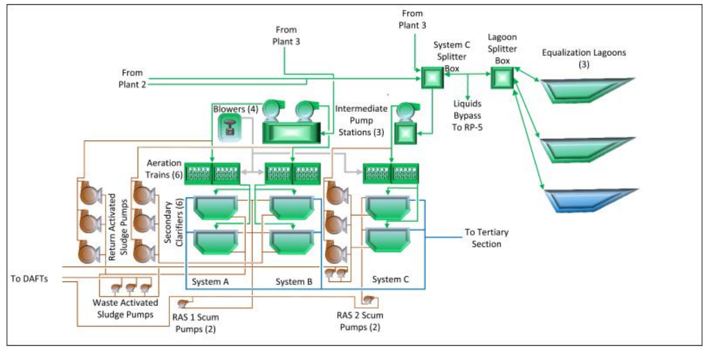
System	Capital Improvement Project Activity	Condition Assessment Report
__Plant 3__		
Influent Channel	1977 1982	
Primary Clarifiers	1977 1982 2007 2013	
Effluent Channel	1977 1982	
Sludge Pumping System	1977 1982	
Scum System	1977 1982 2013	
__Plant 2__		
Primary Clarifiers	1966 1987 1997	Planned 2016
Solids Pumping System	1966 1985 1987	
Trickling Filter Pumps	1966	
Biofilter	2008 2013	Planned 2015

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

__System Summary Continued on Next Page__

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 total). Each 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 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/ft^2 11,310 ft^2	Per Unit
System C	2 @ 700 gpd/ft^2 13,273 ft^2	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 RAS 2	2 @ 400 gpm 2 @ 200 gpm	Per Unit Per Unit

3. Asset Ratings
Table 2 Asset Ratings

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

* Ratings as defined in Appendix A

4. Key Issues
Intermediate Pump Stations
New variable frequency drive technology is available to replace older clutch drives. The System C primary effluent splitter box concrete is corroding, and the gates are not functional. A potential engineering project is needed to address this area.

Flow Equalization System
Recent crack-repair projects have eliminated the cracks in one of the lagoons. Operations and Maintenance staff monitor the status of cracks in the lagoons. A potential engineering project will provide odor control for the flow equalization system or will provide the ability to equalize secondary effluent.

Activated Sludge System
Leaks in the air ducting system will be addressed by Project EN12022 in 2014. A potential project will address upgrades to improve nutrient removal (e.g., mixed-liquor recirculation and anoxic mixers).

Secondary Clarifiers
A rehab of Clarifier No.1 and 2 was done in 2008. A potential project will rehab Clarifier No.5 and 6, including upgrading the weir and launder washing system for algae control.

Return Activated Sludge (RAS) Pumping System
A Maintenance project will address the rehab of valves and flow meters.

Waste Activated Sludge (WAS) Pumping System
The waste activated sludge piping clogs frequently. Flush water is provided; however, the plugging reduces process efficiency. Project EN14020 will address this issue.

Scum Pumping System
The scum discharge piping combines with flow from primary Plant 3 scum pumping system. When all the pumps are running at the same time, the pump station output decreases dramatically, reducing process reliability. This issue will be addressed by Project EN14020.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Intermediate Pump Stations	1977 1987	
Flow Equalization System	1977 1987 1995 2013	
Activated Sludge System	1977 1987 1997	
Secondary Clarifiers	1977 1987	Planned 2014
RAS Pumping System	1977 1987	
WAS Pumping System	1977 1987	
Scum Pumping System	1977 1987	

Table 4 Potential Projects

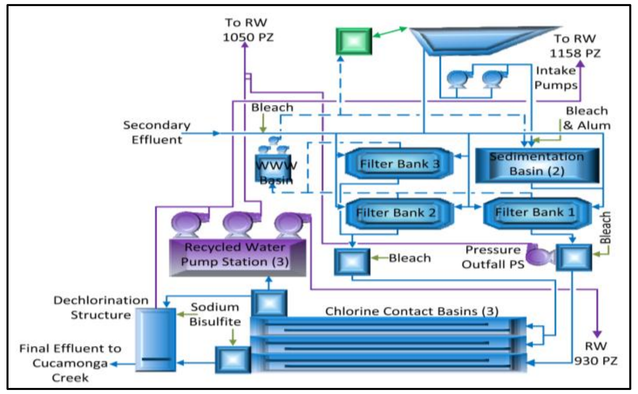
System	Project Name	Project Description
Intermediate Pump Stations	RP1 IPS Rehab	Rehab worn concrete and replace gates for the System C influent splitter box.
Activated Sludge System	RP1 MLR Pump Improvements	This project will install mixed liquor return pumps into the activated sludge system to improve nutrient removal.
Secondary Clarifiers	RP1 Secondary Clarifier Rehab	This project will rehab Clarifiers 5 and 6 and will upgrade the weir and launder washing system for algae control.

System Summary Continued on Next Page

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	3	3	3	3
Alum System	4	3	3	3
Sedimentation Basin	5	3	3	4
Chlorination System	4	3	4	4
Filters	3	3	3	3
Waste-Wash Water Basin	3	3	3	3
Filter Effluent Structures	3	3	3	3
Chlorine Contact Basins	3	3	3	3
Effluent Splitter Box	3	3	3	3
Dechlorination System	2	2	3	3

* Ratings as defined in Appendix A

4. Key Issues

Intake Pump Station
No issues require special attention.

Aluminum Sulfate (Alum) System
The main alum pumps feeding FM-2 have not been run since the sedimentation basin was taken offline. The pumps may need to be rehabilitated before the sedimentation basin can be put back in service.

Sedimentation Basin
The sedimentation basin has not been in operation for several years after the sludge line to solids processing was found to be leaking. During this time the settling tubs were removed from one of the tanks. Pending an evaluation of the benefits provided by this system, a rehab may be done through a potential maintenance project to make the sedimentation basin operable again.

Chlorination System
Project EN11039 will upgrade this system to provide more efficient and effective chemical dosing. In 2014, Project EP14004 will replace the outdated chlorine analyzers.

Filters
The filters' backwash valves leak continuously sending flow to the waste-wash water basin, where the flow must be pumped, resulting in process inefficiencies. Some of the observed underground pipe appears to have significant corrosion. A potential maintenance project will address the valve issue and rehab the internals components of the filters.

Waste-Wash Water (WWW) Basin
The increased on/off cycling of the WWW-basin pumps from the leaking filter-backwash valves results in significantly higher run time than expected. This problem will be addressed by a potential maintenance project.

Effluent Structures
No issues that require special attention.

Chlorine Contact Basins (CCB)
A potential maintenance project will rehab these basins and address any leaks.

Effluent Splitter Box
No issues require special attention.

Dechlorination System
No issues require special attention.

Table 3 History of Select Assets

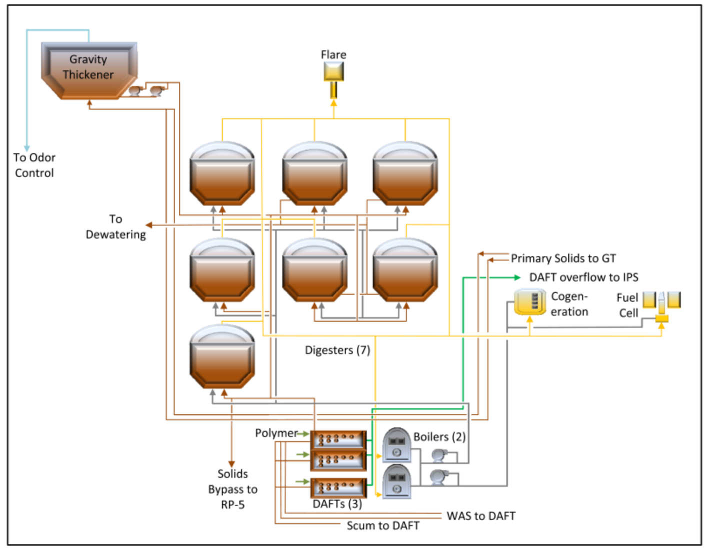
System	Capital Improvement Project Activity	Condition Assessment Report
Intake Pump Station	1977	
Alum System	1977 1998	
Sedimentation Basin	1977 1998	Planned 2015
Chlorination System	1977 2004	
Filters	1977 1982 1987	Planned 2015
Waste-Wash Water Basin	1977 1987	
Filter Effluent Structures	1977 1987	
Chlorine Contact Basins	1997	
Effluent Splitter Box	2002	
Dechlorination System	1992 2011	

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

System Summary Continued on Next Page

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

* Ratings as defined in Appendix A

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 EN14020 will address optimizing the current thickening system or addressing alternative sludge thickening methods.

A condition assessment was performed in 2013 to inspect the interior metallic components and the concrete structure. The assessment identified that the overall condition of the internal structures advocates coating refurbishment and other repairs. In addition, the main gear and scum skimmer arm assemblies are to be replaced. Project EP14002 will address recoating the internal structures and replace the equipment.

Dissolved Air Flotation Thickeners (DAFT) System
Project EN14020 will address upgrades to this system. Project EN14052 will replace above-ground sludge piping to the digester system.

Digester System
Maintenance has an established regimen to clean and rehab one digester a year to remove collected grit, replace piping, install new seals, and maintain critical pieces of equipment. A potential engineering project will upgrade the mixing systems in 5–10 years. The Digester No.1 heat exchanger has been losing heat transfer efficiency because of vivianite buildup. Maintenance currently has a project to replace the sludge tubes to regain heat transfer capabilities

Sludge Transfer System
The sludge transfers 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. A potential engineering project will upgrade the mixing systems in 5–10 years.

Hot Water System
To meet the strict emission requirements of the Southern California Air Quality Management District, the Agency installed new boilers in FY2012/13. The fuel cell heat exchanger was also installed in FY2012/13. The new additions and limited time of operations have posed challenges for operations related to the controls of the boiler system.

Gas Conveyance and Waste System
Project EN13046 will upgrade the flare system and piping system to ensure adequate control of the digester gas pressures. Project PA140001 will replace the iron sponges at the Energy Recovery Building that are starting to deteriorate.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Gravity Thickener System	1987	2013
DAFT System	1977 1987	
Digester System	1975 1977 1985 1982 1992 1999 2008	Dig 1 - 2010 Dig 2 - 2010 Planned Dig 4 - 2014
Sludge Transfer System	2008	
Hot Water System	1977 1985 2012	
Gas Conveyance System	1975 1985 2008	Planned 2015

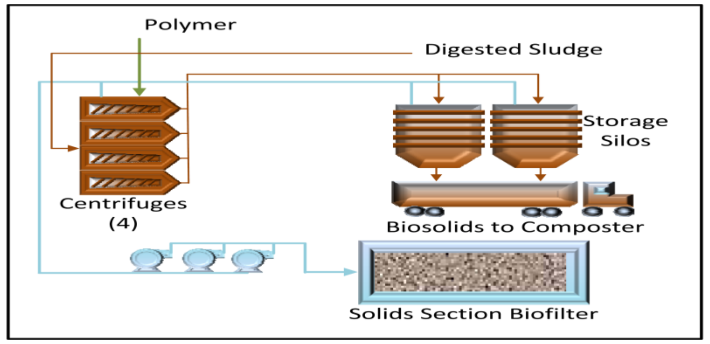
Table 4 Potential Projects

System	Project Name	Project Description
Digester System	RP1 Dig 1 Heat Exchanger Rehab	Project needed to replace the sludge tubes of the RP1 Digester No.1 sludge heat exchanger.

System Summary Continued on Next Page

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/Biofilter 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/Biofilter 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	3	3	3
Sludge Feed Pump System	1	2	3	3
Polymer Blending System	1	2	3	3
Centrifuge System	1	2	3	3
Conveyor System	1	3	4	3
Storage Silo System	1	3	3	3
Centrate and Drainage Pump System	1	3	3	3
Anti-Struvite System	1	2	3	3
Odor Control/Biofilter System	3	3	4	3

* Ratings as defined in Appendix A

4. Key Issues

Centrifuge System
The Centrifuge System will be evaluated in 2014 to assess the effectiveness of the Anti-Struvite System.

Conveyor System
The performance of the Conveyor System will be monitored to determine if modifications are needed to mitigate plugging of transfer points between conveyor units.

Storage Silo System
The performance of the flexible connections between the live bottoms will be monitored to determine if the reliability is acceptable.

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	Planned 2014
Conveyor System	2013	Planned 2018
Storage Silo System	2013	Planned 2018
Centrate and Drainage Pump System	2013	Planned 2018
Anti-Struvite System	2013	Planned 2018
Odor Control/Biofilter System	2003	Planned 2018

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

System Summary Continued on Next Page

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.

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. A yard piping diagram is show in Appendix C.

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 Emergency Generation 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	
Yard Piping	See Appendix C	

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	3	3	3	3
Electrical System	3	4	3	3
Utility Water System	4	3	4	4
Potable Water System	3	3	4	3
Instrumentation and Control System	3	3	3	3
Yard Piping	TBD	3	3	3

* Ratings as defined in Appendix A

4. Key Issues

RP-1 Plant Drain
No issues.

TP-1 Plant Drain
No issues.

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. Maintenance is planning a project to rehab and replace the MCC.

RP-1 power sources have drastically changed over the past several years with the installation of solar panels and the construction of the fuel cell. These new power sources required upgrades to RP-1 electrical equipment; these upgrades are still being tested and evaluated.

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

Utility Water System
A potential maintenance project will rehab deteriorated portions of this system.

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.

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	
Emergency Generation	1994	
Lighting	1977	2011
Utility Water System	1977	
Potable Water System	1977	
Instrumentation and Controls	1977	
Yard Piping	1977	Planned 2014

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

End of System Summary

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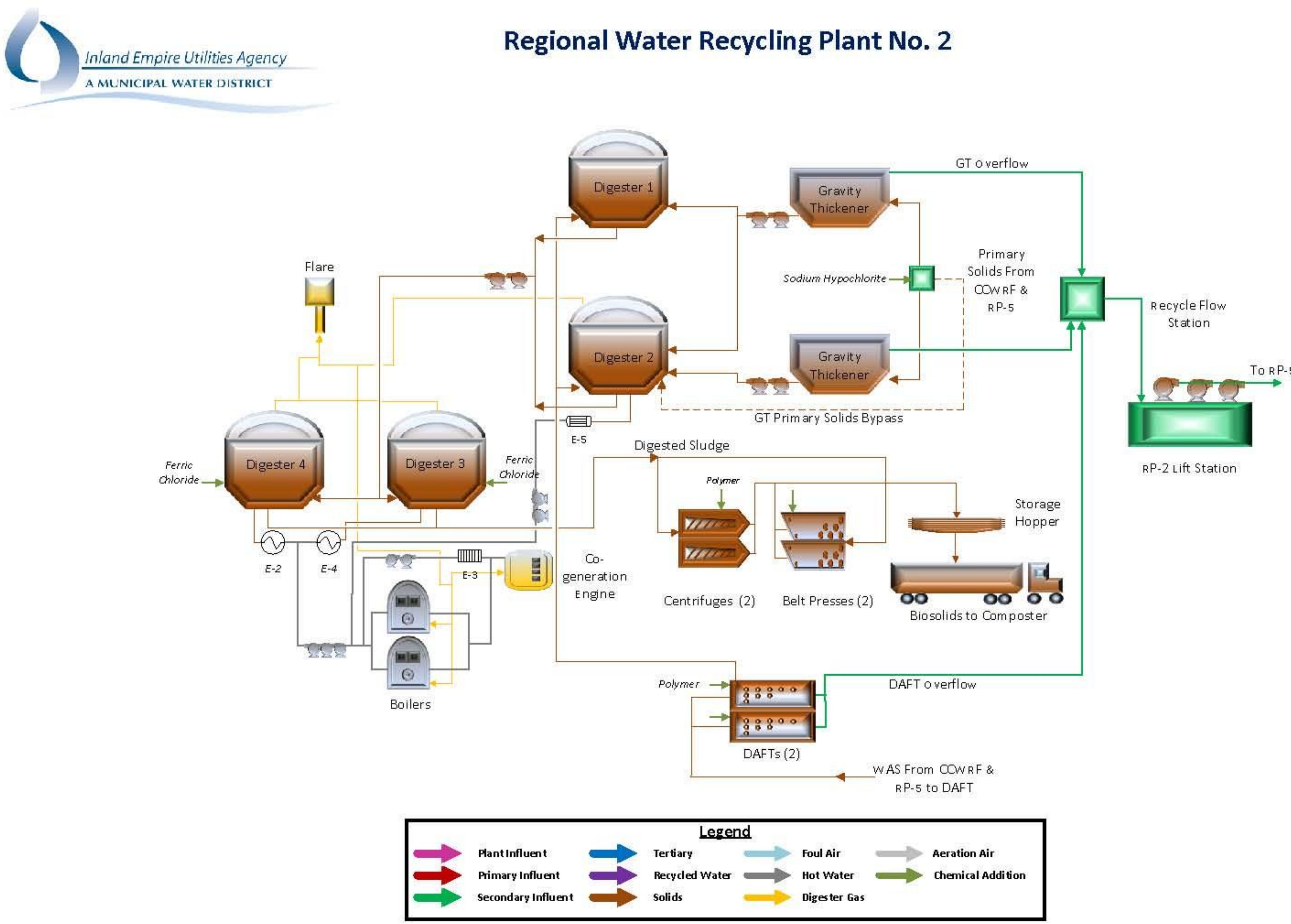

Figure 7-2: Regional Water Recycling Plant No. 2 (RP-2) – Schematic

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

#	Project Number[1]	Project Name	Project Description	Project Type[2]	Fund[3]	Fiscal Year Budget (Dollars)										
						2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	Ten-Year Total
1	EN11042	RP-2 Boiler Replacement	Project to replace boilers at RP-1 and RP-2.	RP	RC	55,000	0	0	0	0	0	0	0	0	0	55,000
2	EN13049	RP-2 Digester #4 Dome Replacement	Project to modify dome from floating to fixed.	CC	RO	400,000	0	0	0	0	0	0	0	0	0	400,000
3	EN14012	RP-2 Drying Beds Rehab	Rehab of drying to allow proper handling of vactor truck material and more efficient air drying of biosolids.	CC	RO	600,000	510,000	0	0	0	0	0	0	0	0	1,110,000

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

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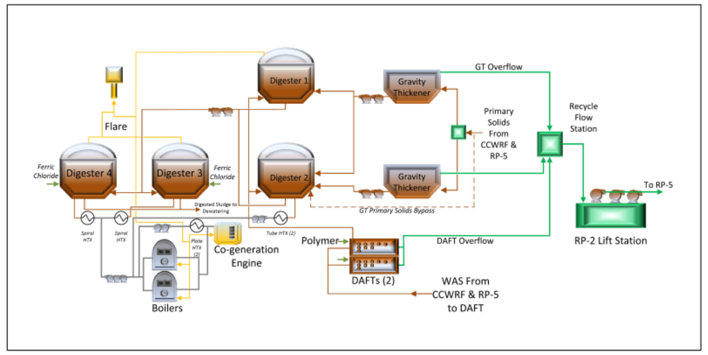
Asset Management System Summary – RP-2

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	3	3	3	3
Digester System	3	3	4	5
Sludge Transfer System	3	3	3	3
Hot Water System	3	4	4	3
Gas Conveyance System	3	4	4	3
RP-2 Lift Station	3	3	3	3

* Ratings as defined in Appendix A

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.

DAFT System
No issues require special attention.

Digester System
The RP-2 digester system is aging, and the associated equipment has undergone increased wear and tear. 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 piping, install new seals and maintain critical pieces of equipment.

The floating dome rail system on Digester 4 is critically damaged and is currently being investigated for repair options. The repair includes fixing the dome in place. Digester 4 is currently out of service, which critically reduces the digestion capacity of RP-2.

Digester 3 has no redundant gas-release points into the gas system when foaming occurs. Modifications are needed for additional gas-release points. The sludge recirculation system on Digester 2 frequently airs up and needs constant attention, causing inadequate mixing.

Sludge Transfer System
The variable frequency drive doesn't operate as designed and are constantly cycling resulting in non-continuous and un-stable volumes fed to Digester 3 and 4.

Hot Water System
The hot water system is inadequate for phased digestion.

Gas Conveyance System
No issues require special attention.

RP-2 Lift Station
No issues require special attention.

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	Dig. 3 – 2011 Dig. 4 – 2013
Sludge Transfer System	1979 1988 2003	
Hot Water System	1988 2003 2013	
Gas Conveyance System	1988 2003	
RP-2 Lift Station	2004	

Table 4 Potential Projects

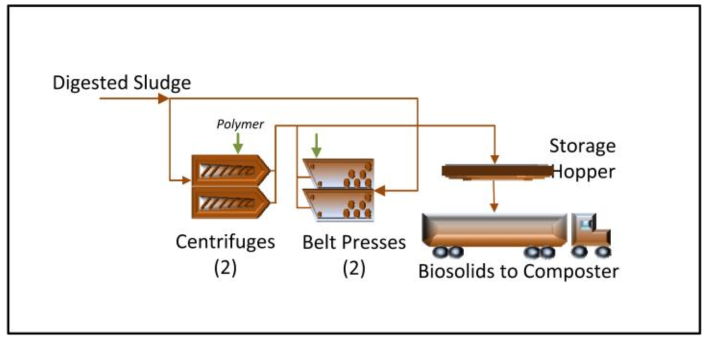
System	Project Name	Project Description
NA	NA	NA

System Summary Continued on Next Page

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	3	3	3
Polymer Blending System	3	3	3	3
Belt Press System	3	3	3	3
Centrifuge System	5	5	4	5
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

4. Key Issues for Further Investigation

Sludge Grinding System
No issues require special attention.

Sludge Feed Pump System
No issues require special attention.

Polymer Blending System
No issues require special attention.

Belt Press System
No issues require special attention. The belt presses were rehabilitated in 2013.

Centrifuge System
One of the two centrifuges is out of service because of obsolete parts. RP-2 operations operates two belt presses now as the normal mode of operation and the one remaining centrifuge on an emergency basis. Because of the anticipated decommissioning of RP-2 within ten years, it is unlikely that improvements to the centrifuge system will be undertaken.

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	
Centrifuge System	2001	
Conveyor System	1979 1988 2008	
Cake Hopper	1988 2008	
Filtrate and Centrate Pump Station	1979 1988	

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

System Summary Continued on Next Page

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.

Co-Generation
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. A yard piping diagram is show in Appendix C.

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 Emergency Generation Co-Generator Generator	 2 @12 kV 2 @ 12 kV to 480 V 2 @12 kV 5 @ 480 V 1 @ 580 kW 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		
Yard Piping	See Appendix C	

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	4	3	3
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

4. Key Issues for Further Investigation

Plant Drain
Draining issues from the RP-2 drying beds need to be diverted into the RP-2 lift station or plant drain. These issues are addressed in the RP-2 Drying Bed Rehab Project.

Electrical System
No issues require special attention.

Utility Water (UW) System
Main isolation valves to key sectors of the plant are limited and require evaluation. Some of the UW isolation valves do no seal and need to be replaced. Replaced valves should be exercised routinely.

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	

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

End of System Summary

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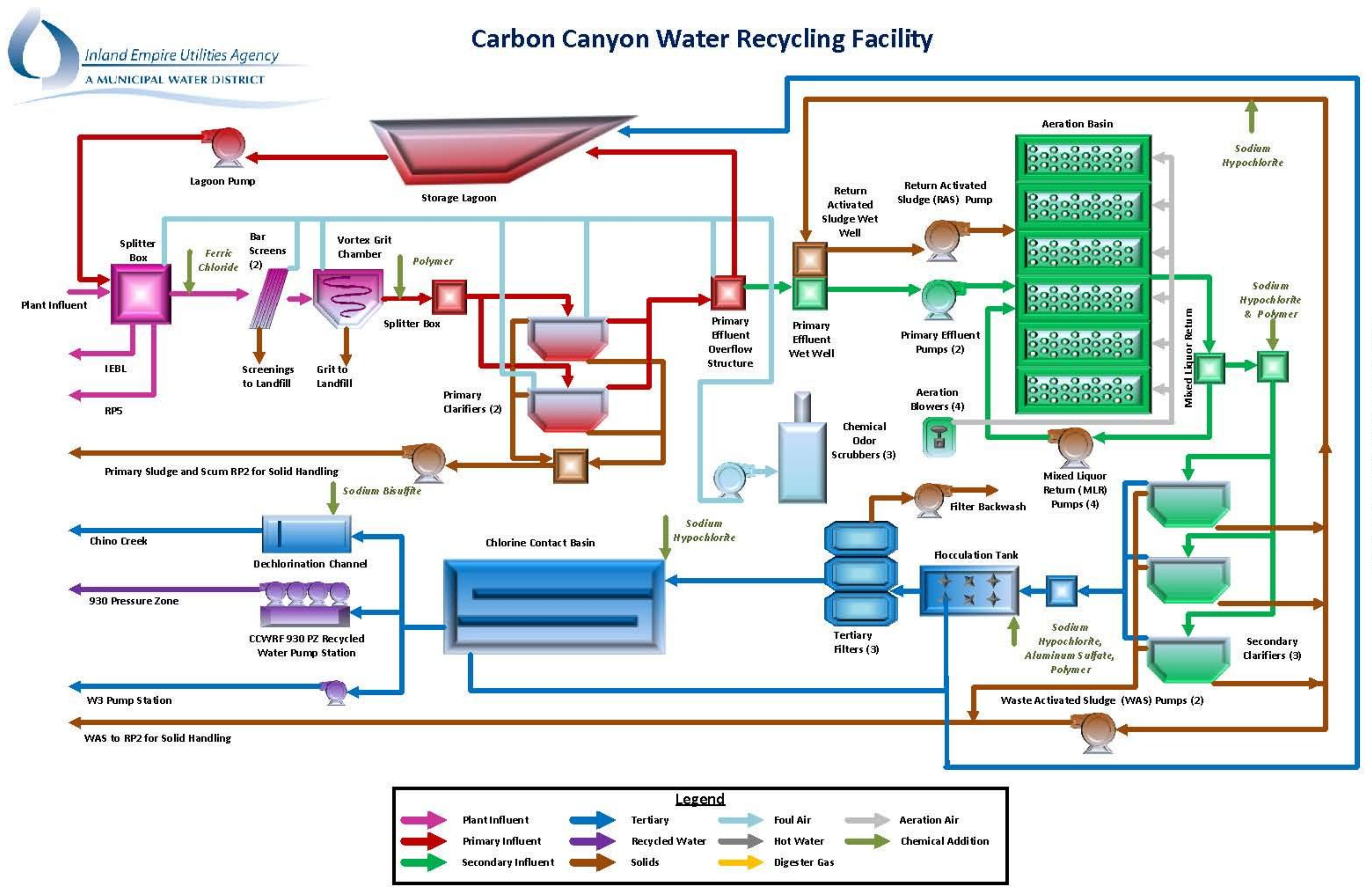

Figure 7-3: Carbon Canyon Water Recycling Facility (CCWRF) – Schematic

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

#	Project Number[1]	Project Name	Project Description	Project Type[2]	Fund[3]	Fiscal Year Budget (Dollars)										
						2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	Ten-Year Total
1	EN13018	CCWRF Odor Control System Replacement	The project entails replacing the existing odor control systems and screens.	RP	RC	500,000	600,000	1,780,000	0	0	0	0	0	0	0	2,880,000
2	EN14027	CCWRF Secondary Clarifier #3 Rehabilitation	Rehab steel components and coat concrete of clarifier.	CC	RO	800,000	110,000	0	0	0	0	0	0	0	0	910,000

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

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

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

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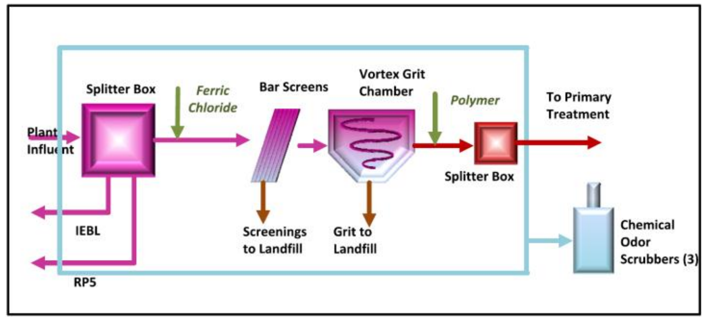
Asset Management System Summary – CCWRF

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 bars 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 the 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 compactor. The collected rag is compacted in the hydraulic compactor, which 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.

Polymer System
Polymer can be injected to the liquid flow after grit removal to enhance primary treatment. The polymer system includes a 500-gallon tote stand, chemical metering pump, mixing chamber, 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	54-inch	
Parshall Flume	1 @ 43.9 MGD	
Gates	2 units	
Screening Equipment		
Mechanical Screen	2 @ 20 mgd	Per Unit
Manual Screen	1 @ 40 mgd	
Gates	3 units	
Vortex Grit System		
Chamber	1 @ 20.3 mgd	
Grit Pump	2 @ 220 gpm 15 hp	Per Unit
Gates	2 units	
Grit Washing & Disposal System		
Classifiers	2 @ 200 gpm	Per Unit
Screening Conveyance & Disposal System		
Conveyor	1 hp	
Compactor	N/A hp	
Ferric Chloride System		
Tank	7,000 gallons	
Pumps	2 @ 92 gph	Per Unit
Polymer System		
Pump	1 @ 4.5 gph	
Headworks Splitter Box		
Gates	3 units	
Odor Control Chemical Scrubbers		
Blower(1A)	1 @ 6,500 scfm	
Blower(1B1,1B2)	2 @ 4,400 scfm	Per Unit
Valves	3 units	> 18-inch

3. Asset Ratings

Table 2 Asset Ratings

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

* Ratings as defined in Appendix A

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 both (or either) RP5 and CCWRF. There is no flow meter, and the flow is 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 for the structure is tight, making it difficult for maintenance or housekeeping. Gates (FGBI-5002, GATE BS-2 Inlet) leading to the west mechanical bar screen have failed in the open position since September 2013.

Project EN 13018 would address the issues stipulated above.

Vortex Grit System
The performance of the vortex grit system is satisfactory. However, it has been 20 years since the original install, and the system is nearing the end of its service life. The downstream processes are vulnerable in a mechanical failure.

Grit Washing/Disposal System
No issues require special attention.

Screening Conveyance/Disposal
The conveyor equipment is corroded and has limited accessibility for cleaning and repair. The screening conveyance system fails regularly (3 to 4 times per year). The screening (rag) washing system does not exist, resulting in high organic content in rags and screening.

An in-house project is in progress to install a new rag washer and rag compaction unit. Project En 13018 may replace the corroded electrical conduit in this area.

Ferric Chloride System
Ferric chloride system operates effectively, but the equipment is 20 years old and is approaching the end of its useful life.

Polymer System
No issues require special attention.

Headworks Splitter Box
No issues require special attention.

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 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.

Project EN 13018 would address the issues stipulated above.

Table 3 History of Select Assets

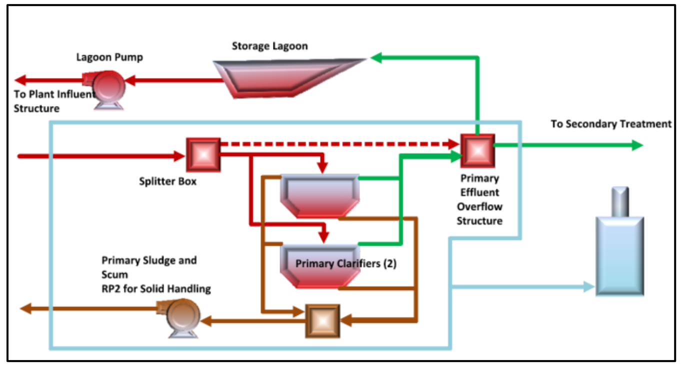
System	Capital Improvement Project Activity	Condition Assessment Report
Influent Channel	1993 2006	
Screening Equipment	1993	
Vortex Grit System	1993	Planned 2016
Grit Washing/Disposal System	1993	
Screening Conveyance/Disposal System	1993	
Ferric Chloride System	1993	
Polymer System	1993	
Headworks Splitter Box	1993	Planned 2016
Odor Scrubber	1993 2011 2012	

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

System Summary Continued on Next Page

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, we can route flow to one or two clarifiers or bypass the primary clarifier(s). 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 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 into an intermediate wet well. A system of valves is manually operated to direct solids to an intermediate wet well where, depending on the level, the sludge is pumped to RP2 for solid handling.

Scum Pumping System
Scum collected in the primary clarifiers is directed to an intermediate wet well and combined with primary sludge. 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 preinstalled pipes at different elevation, the primary treated water is routed to the (1) primary effluent pump station for secondary treatment or the (2) 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 during a low flow condition to be retreated.

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	3	3	3	3
Primary Clarifier	3	4	3	3
Sludge Pumping System	4	4	4	3
Scum Pumping System	3	3	3	3
Intermediate Wet Well	3	3	3	2
Storage Lagoon System	4	2	4	4
Primary Effluent Overflow Structure	3	3	3	3

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation
Primary Splitter Box
Three gates route flow to primary clarifiers. The gates are normally opened but are typically not exercised. The functionality of these gates is largely unknown. Gates operating in similar environment in the sister plants showed severe corrosion. The primary splitter box and three gates should be taken down and inspected.

Primary Clarifiers
Concrete sidewalks surrounding the primary clarifiers are detached from the sidewall and have settled more than five inches. In recent years, there have been numerous pipe line breakages: an 8-inch primary sludge line break and utility water line breakages (2012) near this area. The breakages may be related to the settlement of the soil.

Sludge Pumping System
The piston pumps that convey primary sludge are nearing their useful lives. The in-house project to bypass the existing pumps and intermediate wet well may address this issue.

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
No issues require special attention.

Storage Lagoon System
It is unknown whether the storage lagoon system is intended as a containment system. A survey of historical record does not reveal whether compacted clay liner or geomembrane was used. The bottom of the storage lagoon is concrete, and the side slope is soil with shallow rooted vegetation.

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	Planned 2016
Primary Clarifiers	1993 2006	2014
Sludge Pumping System	1993	
Scum Pumping System	1993 2006	
Intermediate Wet Well	1993	
Storage Lagoon System	1993	
Primary Effluent Overflow Structure	1993	

Table 4 Potential Projects

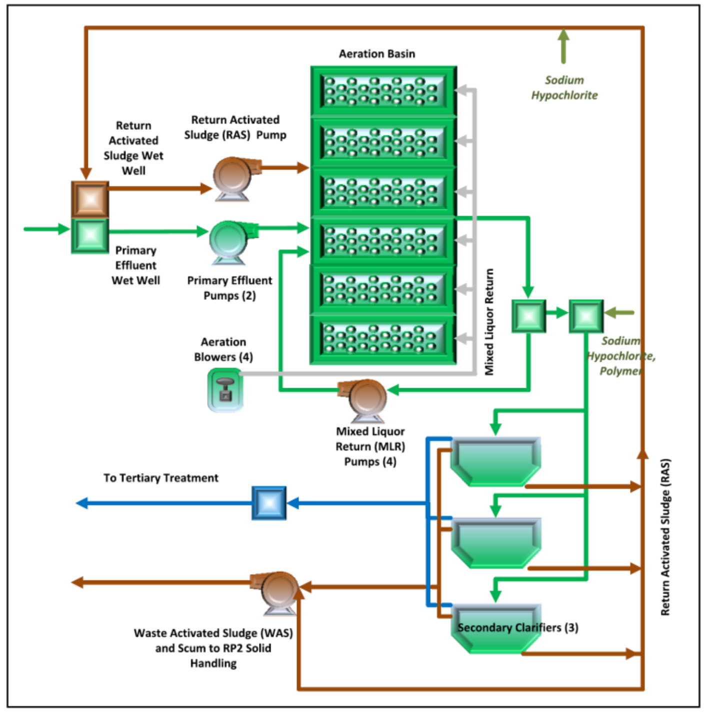
System	Project Name	Project Description
NA	NA	NA

System Summary Continued on Next Page

Asset Management System Summary – CCWRF

Secondary Treatment Process

1. Asset Profile



Primary Effluent Pump System
Primary effluent flows by gravity to the primary effluent pump station wet well. The wet well can be interconnected with return activated sludge (RAS) 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 lift water to the aeration basin.

Activated Sludge System
There are two distribution channels for the aeration basin. By manipulating a system of gates, we can introduce various combinations of primary effluent, RAS, and MLR to the aeration basin. Normal mode of operation is to combine primary effluent, RAS, and MRL flows into 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 followed by three oxic zones to achieve the nitrate removal. A system of aeration sheath, aeration control valves, and dissolved oxygen probes is used to limit or increase the volume of air introduction. The effluent from the aeration basin flows into a common channel, and a percentage of this mixed liquor is rerouted to the front of the aeration basin.

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 units of 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 to mix 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	6 @ 2.02 MGD	
Blowers	3 @ 6000 scfm 400 hp 10.3 psig 1 @ 6400 scfm 400 hp 12.1 psig	Per Unit
Trains	6 @ 1.49 MG	Per Unit
Depth	21 ft	
Mixers	22_ @ 12 hp	
Gates	5 per train	
Valve	4 per system	
Valves (air)	1 (FCV), 3 (manual) per unit	> 12-inch > 12-inch
MLR Pump	4 @ 7,425 gpm 50 hp	
Secondary Clarifiers	3 @ 360 gpd/ft^2 120 ft^2	
Gates	6 units	
RAS Pumping System	1 @ 17.6 MGD 125 hp	
Valves	2 units	> 18-inch
Gates	13 units	
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	3	2	4	3
Secondary Clarifiers	3	3	3	3
RAS Pumping System	3	2	3	2
WAS Pumping System	3	2	2	3
Scum Pumping System	3	3	2	3

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Primary Effluent Pump System
The primary effluent and RAS pump are reconditioned at a scheduled interval and provide adequate pumping capacity and reliability. One of the two primary effluent pumps and the RAS pump were reconditioned in 2013. 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
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 .

The blowers 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.

Many of the gates in the RAS channel that route flows to the aeration basins are severely corroded and do not travel up and down.

Secondary Clarifiers
There is a significant geotechnical settlement near secondary clarifiers that may affect the structural integrity of the buried pipes and electrical conduits. Secondary Clarifiers 1 (EN11045; 2012) and 2 (EN12018; 2013) are rehabilitated, and secondary Clarifier 3 is scheduled to be rehabilitated under Project EN 14027.

RAS Pumping System
The RAS flow meters and RAS flow control valves are more than 20 years old and are nearing the end of their useful service life. The ability to flow desired volume of RAS is important for process control.

WAS Pumping System
The isolation valve upstream of WAS pumping has a broken valve stem and is out of service at unknown valve position (mixed liquor side). Project EN 14027 may address this deficiency.

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 2016
Secondary Clarifiers	1993 2012 2013	
RAS Pumping System	1993 2013	
WAS Pumping System	1993	Planned 2016
Scum Pumping System	1993 2012 2013	

Table 4 Potential Projects

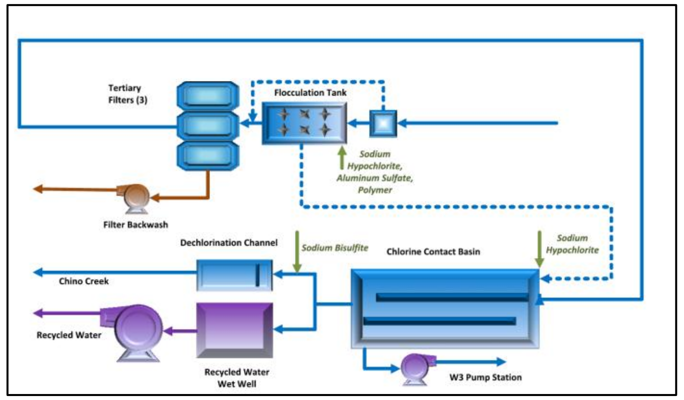
System	Project Name	Project Description
NA	NA	NA

System Summary Continued on Next Page

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. Backwash water is sent to the filter backwash pump station and pumped back into the aeration basin. 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.

Two chemical metering pumps and one 3,000-gallon bleach tank located outside can provide additional bleach injection into the recycled water wet well. This equipment is hardly ever used (no use in last three years).

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

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	4	3	3
Effluent Splitter Box	1	3	3	3
Dechlorination System	3	3	3	3

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

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

Filters
The performance of three shallow bed filters is adequate. Under Project EN 11041, 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.

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.

The chlorine dosing system for the recycled-water wet well is hardly ever used. The sodium hypochlorite solution contained in the outdoor tank loses its strength over time. If there is no need to have a recycled-water chlorination system, the system should be removed.

Chlorine Contact Basins
The chlorine contact basins operate effectively at a designed capacity of11.4 MGD.

Effluent Splitter Box
No issues require special attention.

Dechlorination System
The existing sodium bisulfite solution (SBS) pumping system has sufficient maximum capacity. However, during summer months, the plant's discharge to the Chino Creek decreases and subsequently requires minimal SBS. The existing SBS pumps do not have sufficient turn-down ratio and have a tendency to overdose SBS. Ongoing Project EN 7010 addresses this issue.

In earlier years of CCWRF operation, chlorine gas and sulfur dioxide gas were used to disinfect and dechlorinate the water. The chlorine/sulfur dioxide scrubber system was designed to reduce the release of chlorine gas or sulfur dioxide in any emergency condition that produces a leak of these gases in the chlorine storage area, evaporator room, sulfur dioxide storage area, all located in the chlorine building. The subsequent conversion to more manageable sodium hypochlorite and sodium bisulfite liquid solution resulted in an abandonment of the chlorine and sulfur dioxide scrubber system. The caustic tank, pumps, and scrubber fans have been abandoned onsite and are unsightly. This equipment should be removed offsite for proper disposal. An in-house project may address this issue.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Alum System	1993	Planned 2015
Filters	1993 2012	Planned 2015
Filter Backwash System	1993	Planned 2015
Chlorination System	1993 2004	
Chlorine Contact Basin	1993	
Effluent Splitter Box	2014	
Dechlorination System	1993 2004 2013	

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

System Summary Continued on Next Page

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.

Emergency Generation
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. A yard piping diagram is show in Appendix C.

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 Emergency Generation 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		
Yard Piping	See Appendix C	

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	3	4
Utility Water System	3	4	4	3
Potable Water System	3	3	3	3
Instrumentation and Control System	3	3	3	3
Yard Piping	4	3	4	3

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Plant Drain
No issues require special attention.

Electrical System
During 2012 wet seasons, a few components in the headworks electrical system were vulnerable to moisture. Project EN 13018 and the inhouse rag compactor project may improve this situation.

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.

Potable Water System
No issues require special attention.

Instrumentation and Control System
CCWRF is first plant that will benefit from the SCADA migration project.

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

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	

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

End of System Summary

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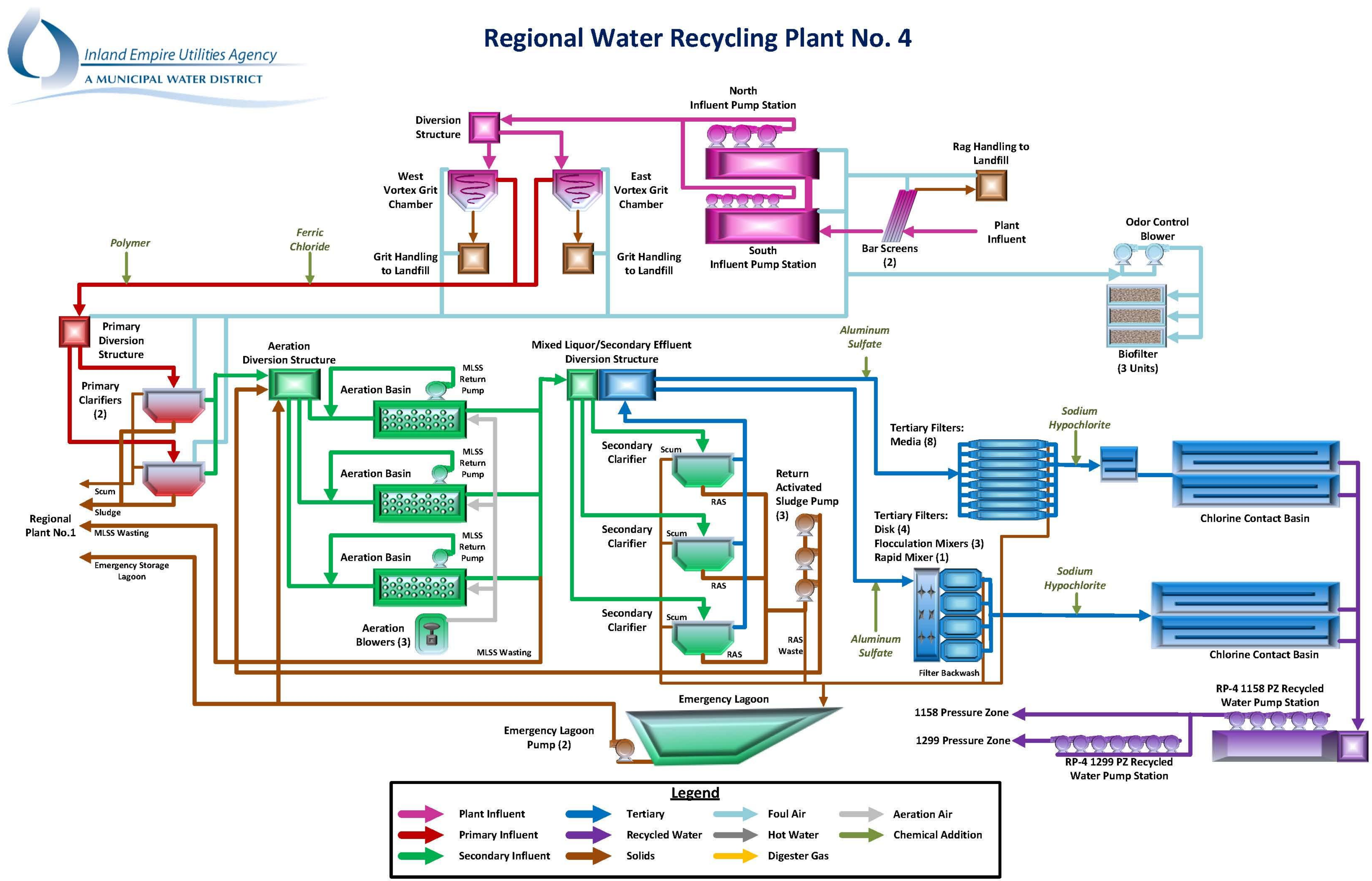

Figure 7-4: Regional Water Recycling Plant No. 4 (RP-4) – Schematic

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

#	Project Number[1]	Project Name	Project Description	Project Type[2]	Fund[3]	Fiscal Year Budget (Dollars)										
						2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	Ten-Year Total
1	EN14018	RP-4 Process Improvements	The project may include various process improvements (RAS wasting piping, WAS station, lagoon pumps, chlorine system, alum dosing, blower cooling water, utility water flow meter).	CC	RC	200,000	900,000	425,000	0	0	0	0	0	0	0	1,525,000
2	EN09021	RP-4 Headworks Retrofit	This project will include replacing both of the bar rack screens with fine screens, modifying the screening enclosure, repaving damaged concrete within the screening enclosure and replacing gates isolating the headworks screens.	CC	RO	900,000	300,000	0	0	0	0	0	0	0	0	1,200,000
3	EN18005	RP-4 Secondary Drains	This project will replace the drain valves of the secondary clarifiers and address the pipeline profile to the emergency lagoon. Start design in FY2019/20.	CC	RO	0	0	0	100,000	500,000	500,000	0	0	0	0	1,100,000

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

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

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

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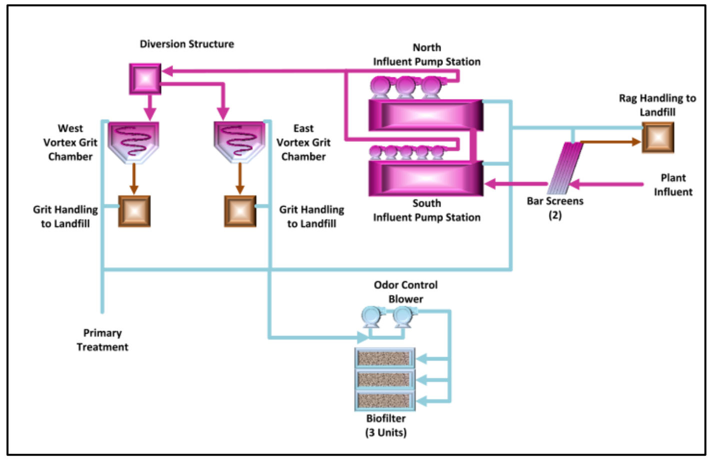
Asset Management System Summary – RP-4

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 conveyed to a waste storage bin to await landfill disposal.

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 three submersible pumps. Both influent pump stations lift screened wastewater into a common pipeline, which enters the headworks flow diversion structure.

Influent Flow Metering
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 are 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 waste bin.

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 Mechanical Screen Gates	2 @ 36.2 mgd 3 hp 4 units	Peak Per Unit
Influent Pump Station Pumps Valves	3 @ 6,000 gpm 100 hp 5 @ 3,275 gpm 50hp 8 units	Per Unit Per Unit > 12-inch
Influent Flow Meter Valves	1 @ 48.3 mgd 3 units	
Vortex Grit System Paddle Drive Pump Gates	2 @ 16.1 mgd 2 @ 1.5 hp 3 @ 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	1 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	3	3	3	3
Screening Equipment	4	3	4	4
Influent Pump Station	3	3	3	3
Influent Flow Metering	3	3	3	3
Vortex Grit System	4	3	4	4
Grit Washing/Disposal System	3	3	3	3
Screening Conveyance/Disposal	4	4	4	4
Odor Control System	3	3	3	3

* These ratings are defined in Appendix A

4. Key Issues for Further Investigation

Influent Channel
Isolation gates do not function appropriately. The isolation gate between screening channels traps solids when the east bar screen is offline and the west bar screen is online. Project EN09021 will modify the influent channel to reduce solids buildup. In addition, isolation gates are being replaced on the influent channel and screens.

Screening Equipment
Both bearings failures on guides and gear boxes as well as some bolts have sheared on the track. The east bar screen rake needs to be rebuilt and is inefficient. Project EN09021 will replace both bar screens with fine screens, also improving the solids capture.

Influent Pump Station
Wet wells have not been cleaned or inspected since construction. Project EN09021 will dewater and clean the structure.

Vortex Grit System
The suction piping to grit pumps in grit chamber no.1 clogs and cannot convey grit slurry. Maintenance has setup flushing and vacuum pump connections to expedite cleaning in the case of suction pump blockage. A permanent correction needs to be made to eliminate the clogging occurrences. Pumps cannot be remotely operated. The east grit chamber isolation gates need to be replaced because they cannot be used by operations. A potential maintenance project will rehab this system.

Grit Washing/Disposal System
The screenings and grit are handled separately. Project EN09021 will provide flexibility to add screenings and grit to a common dewatering bin.

Screening Conveyance/Disposal System
The screenings are not dewatered before final waste hauling disposal. The screenings and grit are handled separately. Project EN09021 will provide flexibility to add screenings and grit to a common dewatering bin. In addition, cleaning and compacting equipment will be installed for the screenings.

Odor Control System
No issues require special attention, but routine media replacement is required to maintain facility air-quality compliance. A planned recurring Agency-wide maintenance project ensures that media is replaced routinely for the odor control system.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Influent Channel	1997	
Screening Equipment	1997 2002	Planned 2014
Influent Pump Station	1997 2009	Planned 2014
Influent Flow Meter	2009	
Vortex Grit System	1997 2009	Planned 2014
Grit Washing/Disposal System	1997 2009	
Screening Conveyance & Disposal System	1997 2009	
Odor Control System	2009 2012	

Table 4 Potential Projects

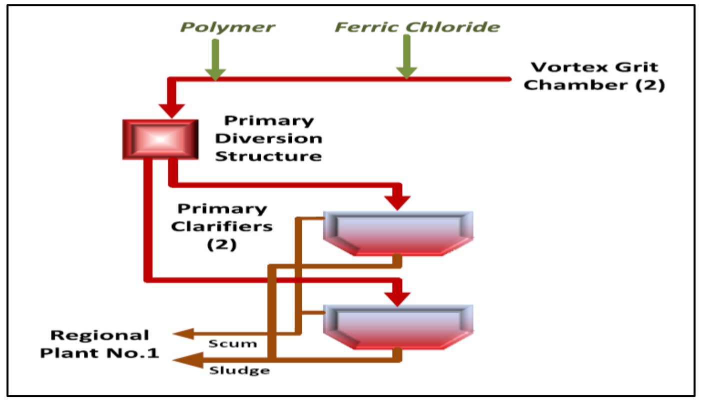
System	Project Name	Project Description
Preliminary Treatment	RP-4 Preliminary Treatment Rehab	A project every 10 to 15 years should rehab concrete, coatings and worn components of gates, channels, screens, grit removal, and influent pump station.
Grit Removal System	RP4 Grit Removal System Rehab	This project will replace the grit chamber isolation gates and retrofit the grit removal pumping system of System No.1.

System Summary Continued on Next Page

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.

Polymer System
Polymer can be added to the treated flow to improve the settling/removal characteristics within the primary clarifiers, but typically polymer is not used at the plant. Polymer can be injected at the primary diversion structure.

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 Mixer Gates	 1 @ 4 hp 3 units	
Ferric Chloride System Pump Chemical Tank	 2 @ 53.1 gph 8,000 gallons	 Per Unit
Polymer System Metering Pump	 2 @ 4.5 gph	 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	 2 units 8 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	4	3	3	3
Ferric Chloride System	3	3	3	3
Polymer System	3	4	3	4
Primary Clarifiers	3	3	3	3
Sludge/Scum Wasting System	3	3	4	4

* These ratings are defined in Appendix A

4. Key Issues for Further Investigation

Primary Diversion Structure
The top of the diversion structure is showing signs of concrete corrosion. Therefore, a condition assessment is planned for 2014. A potential project may be needed to rehab the concrete, install larger inspection hatches for cleaning, and replace influent gates.

Ferric Chloride System
The ferric containment area needs to be recoated. The ferric chloride is being dosed through the polymer system because the original dosing point is upstream of the screening equipment; ferric should be dosed downstream of the grit removal system. A potential maintenance project is needed to rehab this system.

Polymer System
The chemical dosing pipeline is being used to inject ferric chloride, and the system is out of service. Polymer dosing to the secondary system would be beneficial for system upsets or to back-up the alum system. A potential maintenance project is required to rehab this system.

Primary Clarifiers
No issues require special attention. The primaries have never been cleaned or inspected since the original construction of both structures. Maintenance Project IS14004 will address any identified primary clarifier issues. A recurring Agency-wide maintenance project will address condition assessments and minor repairs identified through the process.

Primary Sludge/Scum Wasting System
Scum-well effluent piping tends to get clogged, a problem which requires flushing the piping or removing the material with a vacuum truck. This system should be evaluated to determine the potential for a pumping system in place of the current gravity wasting system.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Primary Diversion Structure	2009	Planned 2014
Ferric Chloride System	2009	
Polymer System	2009	
Primary Clarifiers	2009	Planned 2014
Sludge/Scum Wasting System	2009	

Table 4 Potential Projects

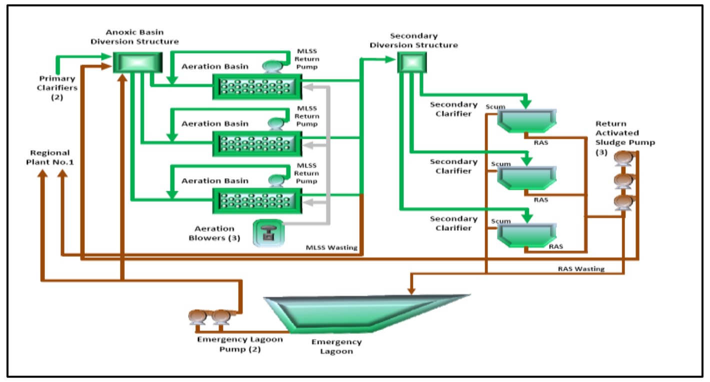
System	Project Name	Project Description
Primary Diversion Structure	RP-4 Primary Diversion Structure Rehab	This project will repair concrete and coat the diversion structure, install larger inspection hatches, and replace primary influent gates.
Ferric Chloride System	RP-4 Ferric System Rehab	This project will rehab the ferric chloride system to recoat the ferric containment area.
Polymer System	RP-4 Polymer System Rehab	This project will rehab the existing polymer dosing system.

System Summary Continued on Next Page

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, creating mixed liquor. Mixed liquor is diverted equally through three 42-inch pipelines, each feeding an activated sludge system.

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 basin is equipped with three mixers to keep solids in suspension throughout the basin. 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. The treatment system is equipped with three 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 to 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 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 clarifier 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 is discharged to 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. Secondary scum and plant drainage are 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 Air Panels Valve Valve (air) MLR Pump MLR Valve	3 @ 7.0 MGD 2 @ 8,000 scfm 500 hp 13.07 psig 1 @ 8,000 scfm 450 hp 9.00 psig 6 units 6 @ 1,54 MG 15.7 ft 6 @ 4 hp 463 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	3	3
Activated Sludge System	4	3	4	4
Mixed Liquor Diversion Structure	3	3	3	3
Secondary Clarifiers	4	3	3	4
RAS Pumping System	3	3	4	3
WAS System	3	4	4	4
Emergency Lagoon	3	3	3	3

* These ratings are defined in Appendix A

4. Key Issues for Further Investigation

Anoxic Basin Diversion Structure
No issues require special attention.

Anoxic Basin
The anoxic mixer occasionally fails, requiring a replacement, rebuild, or repair.

Activated Sludge System
Miscellaneous equipment failures, such as anoxic mixers, mixed liquor return pump, thermal air flow meters, dissolved oxygen probes, and actuated air valves, may require equipment replacement, rebuild, or repair. Foam is trapped between basins, and there are no means or methods to remove the foam. There are multiple broken panels throughout the aeration basin system; panels are currently isolated locally. A planned Agency-wide maintenance project will replace the panels throughout the system.

The higher-pressure rated Kawasaki and Turblex blowers are inefficient. The blowers rated for higher pressure cannot run for long periods of time with lower-rated Turblex blowers without failing when in auto. The Kawasaki blower does not follow pressure set point. A potential engineering project will replace the Kawasaki blower.

Mixed Liquor Diversion Structure
No issues require special attention.

Secondary Clarifier
The secondary clarifier effluent launders and trough produce large amounts of algae, requiring operator hours for cleanup. The secondary clarifiers do not drain completely because of six feet of elevation rise between the drain and emergency lagoon. Clarifier 1 valve has failed and has been replaced with a plug. A planned engineering project will address these issues.

RAS Pumping System
The RAS wasting valve can only waste to the lagoon; excess solids in the lagoon create a septic environment and increased odors. The wasted RAS flow should be discharged directly to the sewer. In addition, the wasting may be more efficient if pumped from the system rather than wasted by gravity. A planned Engineering Project EN14018 may address the system issues. A potential project is needed to address the ability to control flows from each clarifier.

WAS Station
The flow meter is erratic when the valve is partially opened. The flow meter piping needs to be augmented to flood the flow meter at all times. The flow meter may not be full at all times. In addition, the wasting may be more efficient if pumped from the system rather than wasted by gravity. A planned Engineering Project EN14018 may address the station issues.

Emergency Lagoon
The lagoon recovery-pump-station flow meter is a local readout only. A planned Engineering Project EN14018 may address the pump station issue.

Table 3 History of Select Assets

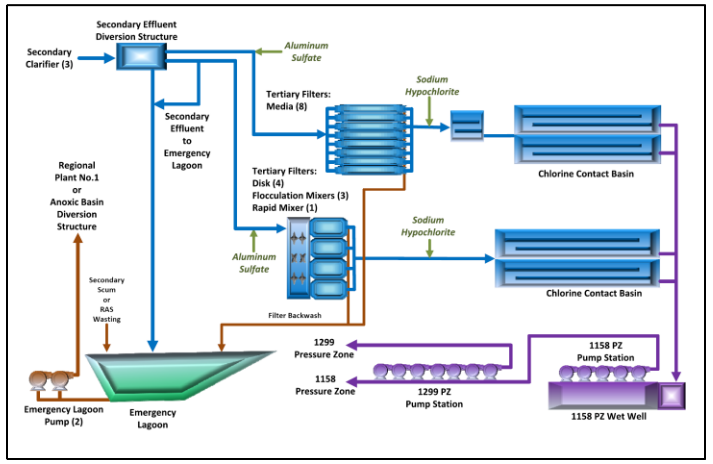
System	Capital Improvement Project Activity	Condition Assessment Report
Anoxic Basin Diversion Structure	2009	
Anoxic Basin	1997 2009	Planned 2014
Activated Sludge System	1997 2003 2009	Planned 2014
Mixed Liquor Diversion Structure	2009	
Secondary Clarifiers	2009	Planned 2014
RAS Pumping System	2009	
WAS Station	2009	
Emergency Lagoon	1997	

Table 4 Potential Projects

System	Project Name	Project Description
Activated Sludge System	RP-4 Blower Replacement	This project will replace the Kawasaki blower.
RAS Pumping System	RAS Pumping System Upgrade	This project will install new valves and piping to provide flexibility to pull from each clarifier.

System Summary Continued on Next Page

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 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 chlorine contact basins. Bleach is stored in three bulk storage tanks in the maintenance building.

Chlorine Contact Basins (CCB)
The facility is equipped with two chlorine 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.

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 Gates	 3 units	
Alum System Tank Transfer Tank Transfer Pump Pump Trident Filters Aqua Filters	 2 @ 2,200 gallons 2 @ 400 gallons 2 @ 90 gph 1 @ 124 gph 2 @ 34.5 gph 2 @ 12.5 gph	 Per unit Per unit Per unit Per unit Per unit
Trident Filters Absorption Clarifier Media Filter Backwash Pump Backwash Blower Valves	 8 @ 11 gpm/ft^2 140 ft^2 8 @ 5 gpm/ft^2 313 ft^2 2 @ 4,200 gpm 100 hp 2 @ 1120 scfm 30 hp 16 units	 Per unit Per unit Per unit Per unit > 18-inch
Aqua Disk Filters Rapid Mixer Flocculation Mixer Backwash Pump Helical Gear Drive Gates Valves	4 @ 5.8 gpm/ft^2 646 ft^2 1 @ 5 hp 3 @ 1 hp 8 @ 1,760 gpm 3 hp 4 @ 15,597 lb.-inch ¾ hp 3 units 4 units	Per unit Per unit Per unit Per unit > 18-inch
Chlorination System Tank Pump Trident Filters RAS Pipeline CCB1A CCB2 SBS (O/S) Water champ Mixer	 3 @ 2,200 gallons 1 @ 77 gph 1 @ 22.5 gph 1 @ 90 gph 2 @ 180 gph 2 @ 124 gph 2 @ 46.9 gph 2 @ 30 gpm 7.5 hp	 Per unit Per unit Per unit Per unit
Chlorine Contact Basin CCB1A & 1B CCB2 Gates CCB1A CCB1B CCB2 Valves CCB1B	 7.0 MGD 1.15 MG 7.0 MGD 1.01 MG 1 units 2 units 2 units 1 units	 T22 Report T22 Report > 18-inch

3. Asset Ratings
Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Secondary Effluent Diversion Structure	3	3	3	3
Alum System	3	3	4	3
Trident Filters	4	3	4	4
Aqua-Aerobics Disk Filters	4	3	3	3
Chlorination System	4	3	4	4
Chlorine Contact Basin	3	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
No issues require special attention.

Alum System
The alum pumps have issues operating automatically, and they do not pace with flow. A planned Engineering Project EN14018 may address the system issues.

Trident Filters
Maintenance is needed for the air compressors. The absorption media and filter media are routinely replaced by maintenance staff. Operations has experienced multiple failures of the backwash, effluent, and waste valves. A thorough condition assessment needs to be performed on the filtration system. A potential project is needed to replace the worn equipment.

Aqua-Aerobics Disk Filters
The drive chain is occasionally adjusted or replaced. The cloth media is at the end of its useful life and has poor solids capture of the secondary effluent. Maintenance Project PA14003 will replace the filter fabric; the filter fabric will be bleach resistant.

Chlorination System
The chlorine containment area needs to be coated and is showing signs of leakage into the common walls of the maintenance building. The pipe fittings for the pumps and tanks leak into the containment area continuously. A potential engineering project is needed to coat the containment area and repair the leaking fittings. The 2,200-gallon bleach tanks are too small and require routine rotation during the day to maintain bleach supply to the metering pumps.

A bleach line is needed for algae control; the Agency is transitioning to bleach-resistant filter fabric, so bleach can be regularly dosed upstream of the disk filters.

CCB1A bleach pumps have issues operating automatically because the stroke is fixed at 50 percent length. CCB2 bleach pump is out of service because of a faulty control board.

The chlorine analyzers are no longer supported by the manufacturer and fail frequently. Agency-wide Project EP14004 will replace the outdated chlorine analyzers in 2014.

Chlorine Contact Basin (CCB)
There are cracks and gaps on the chlorine contact basin covers, and sand and debris infiltrate the structure. The CCB1A effluent gate needs to be repaired, replaced, or removed from operation. A potential maintenance project will assess the condition of the basins and repair points of infiltration.

Effluent Splitter Box
No issues require special attention.

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 in 2014
Aqua-Aerobics Disk Filters	2009	
Chlorination System	2003 2009	
Chlorine Contact Basin	2003 2009	Planned in 2014
Effluent Splitter Box	2003	

Table 4 Potential Projects

System	Project Name	Project Description
Filters	RP4 Filter Rehab	A recurring project every 10 to 15 years should rehab concrete, coatings, and worn components of the Trident and Aqua Disk filters.
Chlorination System	RP4 Chlorine Contact Basin Rehab	A recurring project every 10 to 15 years should rehab concrete, coatings, and worn components of the chlorine contact basins.

System Summary Continued on Next Page

Asset Management System Summary – RP-4

Auxiliary Systems

1. Asset Profile

Emergency Generation
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. A yard piping diagram is show in Appendix C.

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
Emergency Generation		
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	
Yard Piping	See Appendix C	

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	3	3
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

4. Key Issues for Further Investigation

Electrical System
The current generator may not have sufficient capacity to supply power to the facility and the recycled water pump stations. Maintenance is evaluating the limitations of the emergency generator.

Utility Water System
The plant utility water is not monitored from the 1299 recycled water pump station.

The blower cooling water uses potable water; there are potential recycled water connections within 100 feet of the blower building to reduce the facility's potable water usage.

A planned Engineering Project EN14018 may address the system issues.

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
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	

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

End of System Summary

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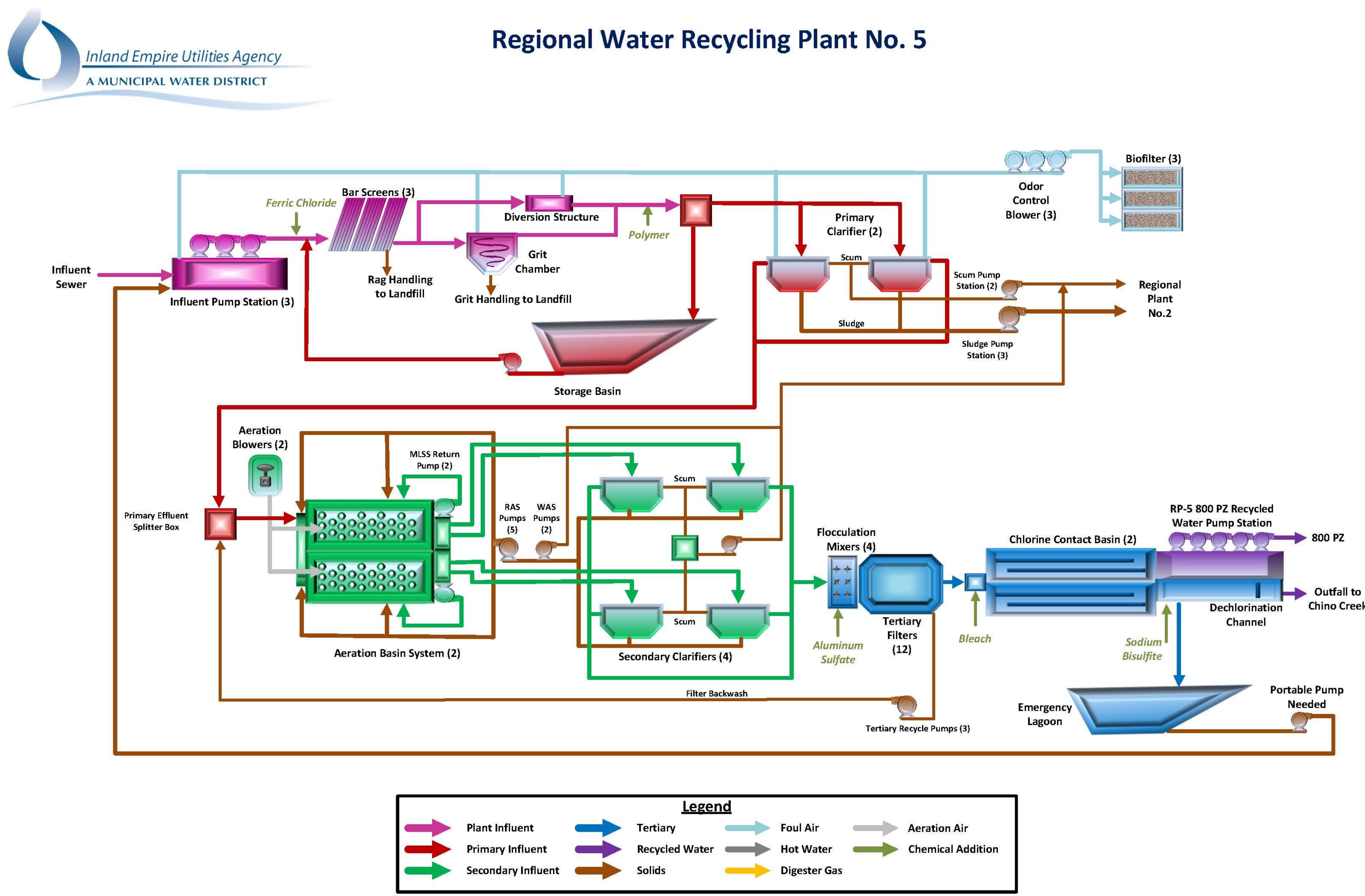

Figure 7-5: Regional Water Recycling Plant No. 5 (RP-5) – Schematic

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

#	Project Number[1]	Project Name	Project Description	Project Type[2]	Fund[3]	Fiscal Year Budget (Dollars)										
						2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	Ten-Year Total
1	EN11031	RP-5 Flow Equalization and Effluent Monitoring	Modifications in the primary effluent splitter box. The 12' 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.	CC	RC	700,000	763,000	0	0	0	0	0	0	0	0	1,463,000
2	EN13047	RP-5 Standby Generators Control Modifications	Install modifications to the standby generator controls.	CC	RC	270,000	25,000	0	0	0	0	0	0	0	0	295,000
3	EN19001	RP-5 Expansion to 30 mgd	Expand existing RP-5 liquid treatment capacity from 15 to 30 mgd. Project cost estimated at $150M.	CC	RC	0	0	0	0	100,000	0	0	0	0	0	100,000
4	EN19006	RP-5 SHF	Construct new solids handling facility at RP-5 to decommission RP-2.	CC	RC	0	0	0	0	250,000	25,000,000	25,000,000	25,000,000	25,000,000	0	100,250,000
5	MM15002	Purchase & Installation of RP-5 Satellite Warehouse & MM Shop Steel Bldgs.	Purchase and installation of RP-5 Satellite Warehouse & MM Shop Steel Bldgs.	CC	RC	0	0	0	0	0	200,000	50,000	0	0	0	250,000
6	EN23001	RP-5 Biofilter Improvements	Consists of providing a new foul-air distribution system at the base of the biofilter to match the other Agency biofilters.	CC	RO	0	0	0	0	0	0	0	0	100,000	250,000	350,000

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

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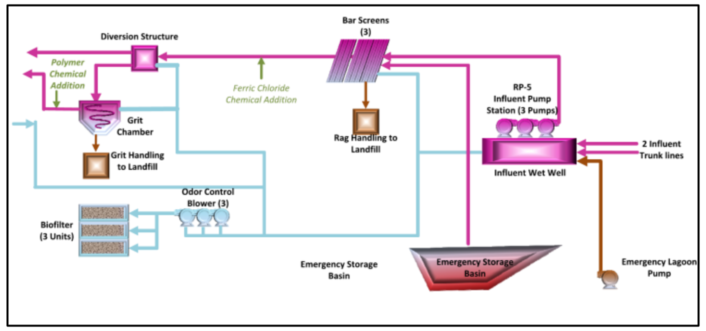
Asset Management System Summary – RP-5

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-clog, 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	3 @ 8,333 gpm 200 hp 7 units	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 ft^3/hr	Per Unit
Screening Conveyance & Disposal System Conveyor Washer Compactor	 1 @ 5.0 hp 1 @ 32 ft^3/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	 3 @ 667 ft^3	Per Unit
Blowers	3 @ 13,200 scfm 30 hp	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	3
Vortex Grit System	3	3	3	3
Grit Washing/ Disposal System	3	3	3	3
Screening Conveyance/Disposal System	5	4	5	5
Ferric Chloride System	3	3	3	3
Polymer System	3	3	3	3
Headworks Splitter Box	3	3	3	3
Biofilter	3	3	3	3

* Ratings as defined in Appendix A

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. A maintenance project is planned in 2014 to remove the existing equipment and replace it with a new JWC washer/compactor.

Vortex Grit System
The vortex grit chamber is not operated because the grit piping clogs frequently when the chamber is in operation.

Grit Washing/Disposal System
No issues require special attention

Screening Conveyance/Disposal
The RP-5 screenings washer/compactor has been unreliable from installation. Routine failures resulting from poor equipment design prompted the Agency to seek alternative equipment. The equipment has been taken out of service, and a new equipment installation is planned.

Ferric Chloride System
The ferric chloride system operates effectively, but because of process optimizations, minimal ferric chloride is dosed at RP-5.

Polymer System
No issues require special attention.

Biofilter
No issues require special attention, but routine media replacement is required to maintain facility air-quality compliance. A planned recurring maintenance project is required to ensure that routine media replacement is taking place for the odor control system. Media was last replaced in 2010, during which the Agency performed an internal condition assessment.

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	

Table 4 Potential Projects

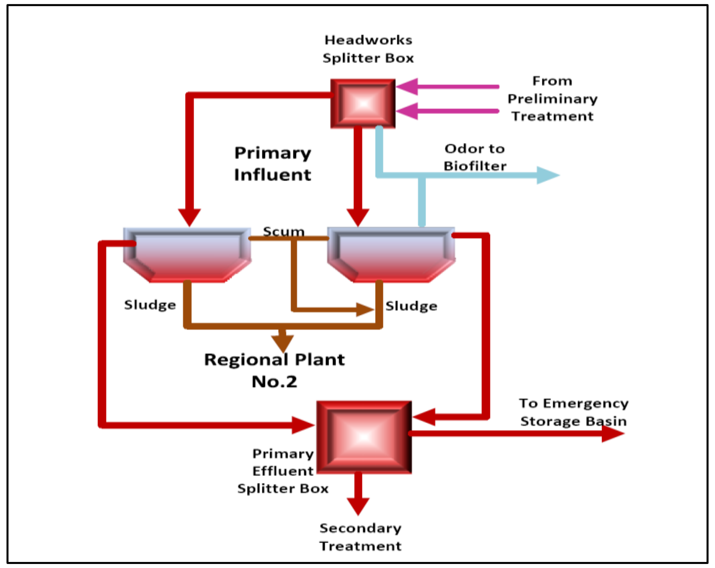
System	Project Name	Project Description
NA	NA	NA

System Summary Continued on Next Page

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 Storage Basin	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	3	3	3	3
Primary Clarifiers	3	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	3	3	4	3
ESB System	3	3	3	3

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Headworks Splitter Box
No issues require special attention.

Primary Clarifiers
No issues require special attention.

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 EN11031 will address this issue.

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. Addressing this deficiency is a low priority and will likely be addressed when a new RP-5 solids handling facility is built.

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	East – 2013
Primary Effluent Splitter Box	2004	Planned 2014
Sludge Pumping System	2004	
Scum Pumping System	2004	
Emergency Storage Basin	2004	
ESB System	2004	

Table 4 Potential Projects

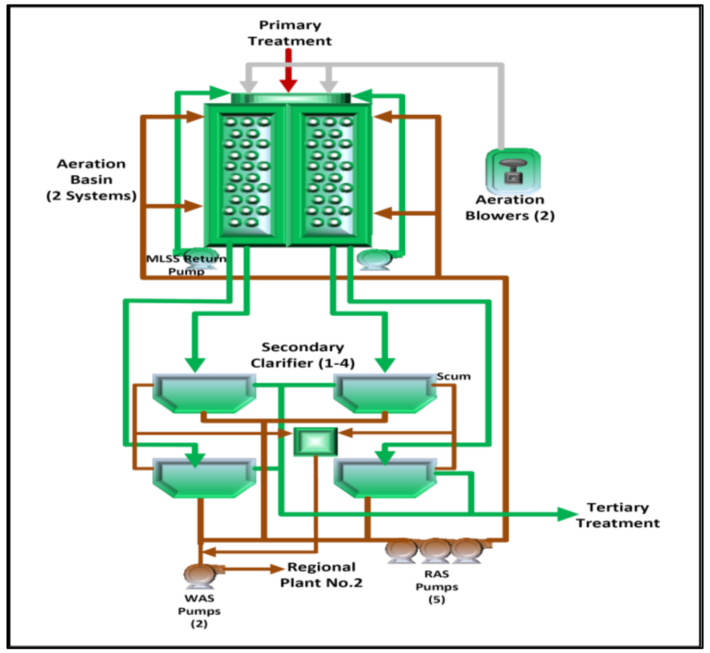
System	Project Name	Project Description
NA	NA	NA

System Summary Continued on Next Page

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 floc, 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 flow through 36-inch gravity pipelines into the secondary clarifiers (four 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	4 @ 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	3	3

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Activated Sludge System
No issues require special attention.

Secondary Clarifiers
Algae control in the launders is a challenge. Automated weir-washing systems may be installed during future clarifier rehab work.

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	

Table 4 Potential Projects

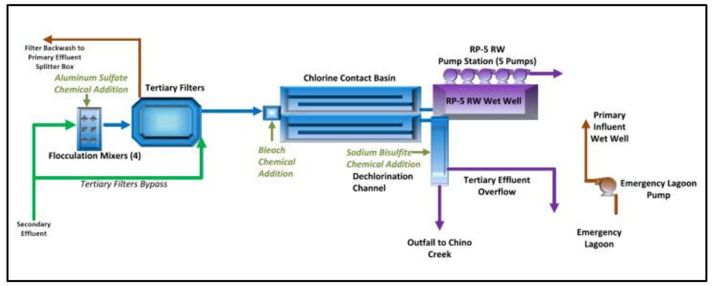
System	Project Name	Project Description
NA	NA	NA

System Summary Continued on Next Page

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. After passing through the rapid mix and flocculation basin, where chemicals are added to aid in filtration, the secondary effluent flows 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	560 gallons	
Pumps	2 @ 14 gph	Per Unit
Flocculation Tank		
Rapid Mixer	1@ 30 hp	
Mixer	1@ 3 hp 1@ 2 hp 1 @ 1.5 hp 1@ 1 hp	
Filters	12 @ 300 ft^2	Per Unit
Filter Loading	5 gpm/ft^2	
Recycle Pumps	3 @ 420 gpm 7.5 hp	Per Unit
Gates	1 units	
Chlorination System		
Tanks	4 @ 10,500 gallons	Per Unit
Pumps	9 @ 77 gph	Per Unit
Water Champ	1 @ 20 hp	
Mixer	1 @ 30 hp	
Chlorine Contact Basins	2 @ 0.9 MG	Per Unit
Gates	4 units	
Dechlorination System		
Tanks	2 @ 5,100 gallons	
Pumps	4 @ 53 gph	
Gates	3 units	

3. Asset Ratings

Table 2 Asset Ratings

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

* Ratings as defined in Appendix A

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. The continuous and abrasive sand-washing action damages OEM stainless-steel air-lift pumps, which need to be replaced routinely with PVC air-lift pumps. Sand gets carried to the backwash water-wet well and then is pumped to the primary effluent splitter box. The performance of the sand-washing system is difficult to maintain. These issues will be addressed in future rehab work.

Chlorination System
The current sodium hypochlorite (bleach) dosing system requires significant maintenance as a result of leaking pumps. The pumps are located outdoors and have no protection against the elements. Crystallization of the bleach at the discharge of the pipe has caused issues. Chemical flow metering is being considered for chlorine dosing. Project EN11031 is expected to address these issues.

Chlorine Contact Basins (CCB)
The chlorine contact basin does not have a flow meter at the influent. Flow into the CCB influent is back-calculated, which causes delayed bleach-dosing issues. The mixing of bleach at the CCB is not optimal. Project EN11031 is expected to address these issues.

Dechlorination System
The sodium bisulfite (SBS) pumps are near the end of their useful life, and the pumps don't have the operating range to meet the variations in dechlorination needs resulting from variable recycled water demands. Project EN11031 is expected to address these issues.

Table 3 History of Select Assets

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

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

System Summary Continued on Next Page

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.

Emergency Generation
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. A yard piping diagram is show in Appendix C.
.

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
Emergency Generation		
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	
Yard Piping	See Appendix C	

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

4. Key Issues for Further Investigation

Plant Drain
No issues require special attention.

Electrical System
No issues require special attention.

Utility Water System
Some of the UW isolation valves do no seal and need to be replaced. Replaced valves should be exercised routinely.

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	

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

End of System Summary

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Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

Recycled Water & Ground Water Recharge Systems

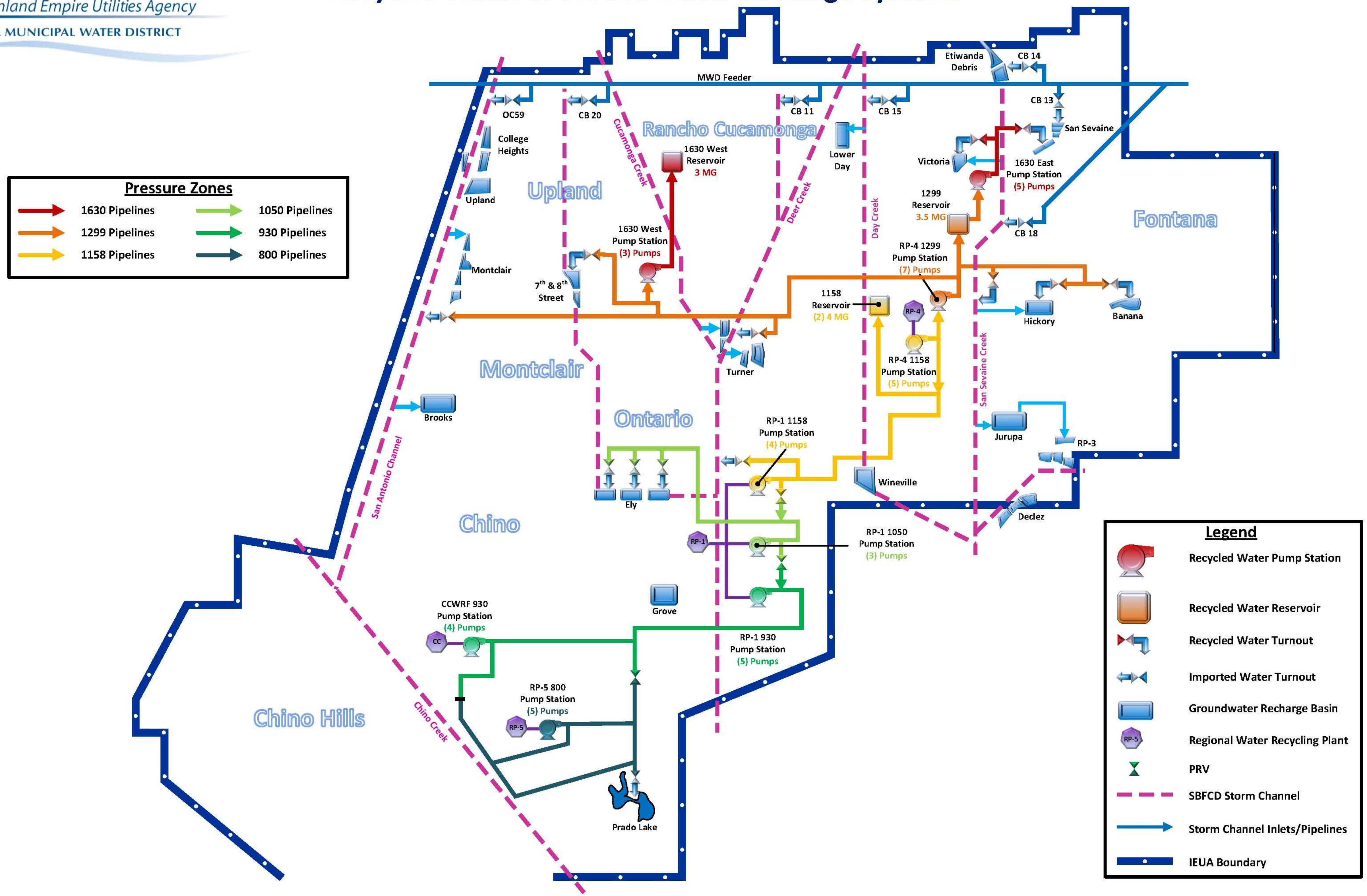

Figure 7-6: Recycled Water Distribution (RW) & Ground Water Recharge Systems (GWR) – Schematic

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

#	Project Number[1]	Project Name	Project Description	Project Type[2]	Fund[3]	Fiscal Year Budget (Dollars)										
						2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	Ten-Year Total
1	EN14007	Misc RW Projects	Misc RW Projects	CC	WC	0	0	0	0	0	0	0	0	0	0	0
2	EN14010	CM Misc RW Constr & Emergency Projects	CM Misc RW Constr & Emergency Projects	CC	WC	0	0	0	0	0	0	0	0	0	0	0
3	EN14028	Vulcan Pit Development	This project will convert the existing Vulcan mining pit into a functional 60-acre groundwater recharge basin.	CC	WC	100,000	0	0	0	0	0	0	0	0	0	100,000
4	EN14040	Jurupa PS HVAC Improvements	VFD temperature control requires HVAC improvements.	CC	RW	50,000	0	0	0	0	0	0	0	0	0	50,000
5	EN14041	RP-4 1158 and 1299 Pump Station Upgrades	Pump upgrades to increase capacity, and new backup generator.	CC	WC	50,000	550,000	3,000,000	2,000,000	0	0	0	0	0	0	5,600,000
6	EN14042	RP-1 1158 Pump Station Improvements	Pump station improvements to increase capacity.	CC	WC	100,000	550,000	3,000,000	350,000	0	0	0	0	0	0	4,000,000
7	EN14043	RP-5 Pipeline Bottleneck	Evaluation of additional recycled water pipeline leaving RP-5 to allow more recycled water to be delivered from this facility into the 800 Pressure Zone.	CC	WC	100,000	550,000	300,000	350,000	0	0	0	0	0	0	1,300,000
8	EN14044	RW Hydraulic Modeling	RW Hydraulic Modeling	CC	WC	75,000	33,000	0	0	0	0	0	0	0	0	108,000
9	EN14045	RW Program Strategy	RW Program Strategy	CC	WC	35,000	0	0	0	0	0	0	0	0	0	35,000
10	EN14047	GWR & RW SCADA Control Equipment Upgrades	This project will upgrade SCADA control system for all GWR and RW facilities.	CC	WC	500,000	302,000	0	0	0	0	0	0	0	0	802,000
11	CW15016	RW OE Projects	RW OE Projects	OM	WC	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	500,000
12	EN06025	Wineville Extension Pipeline Segment A	A new 24-inch recycled water pipeline along Wineville Ave. from Airport Dr. to Jurupa St. continuing with a new 36-inch recycled water pipeline to RP-3 Groundwater Recharge Basin. The project includes a recycled water turnout to feed RP-3 Basin and a turnout to feed Declez Basin.	CC	WC	3,000,000	12,700,000	0	0	0	0	0	0	0	0	15,700,000
13	EN07010	CCWRF Pump Station Expansion	The pump station is being upgraded with five new, more efficient pumps: · (2) 300 hp vertical-turbine, VFD-driven, 2,585 gpm pumps · (3) 300 hp vertical-turbine, constant	CC	WC	50,000	0	0	0	0	0	0	0	0	0	50,000

#	Project Number[1]	Project Name	Project Description	Project Type[2]	Fund[3]	Fiscal Year Budget (Dollars)										
						2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	Ten-Year Total
			speed, 2,585 gpm pumps													
14	EN09007	1630 East Reservoir & Segment B Pipeline	Construction of about 11,000 LF of 36-inch pipeline from the Segment A pipeline end to the new 1630 East Reservoir. Construction of an 8.0 MG recycled water reservoir at the Lloyd Michael's Water Treatment Plant.	CC	WC	0	0	0	0	0	0	663,000	3,813,000	925,000	0	5,401,000
15	EN12014	1630 East Pipeline Relocation	The project will relocate the 1630 East Pipeline at Baseline Ave. and East Ave to allow for improvements to the 15 freeway off-ramp.	CC	WC	400,000	100,000	0	0	0	0	0	0	0	0	500,000
16	EN12016	North CIM Lateral	Construct recycled water lateral to the north side of CIM.	CC	WC	100,000	110,000	0	0	0	0	0	0	0	0	210,000
17	EN12019	GWR & RW SCADA Communication System Upgrades	This project will upgrade the SCADA communication system for all GWR and RW facilities.	EQ	WC	650,000	520,000	0	0	0	0	0	0	0	0	1,170,000
18	EN13001	San Sevaine Improvements	Project will modify the San Sevaine Basin Turnout to extend the discharge location from San Sevaine Cell No. 5 to the farthest north Cell No. 1.	CC	WC	100,000	1,040,000	810,000	0	0	0	0	0	0	0	1,950,000
19	EN13023	930 Pressure Zone Pipeline	Approximately 18,000 LF of 30-inch pipeline connects the CCWRF System Pipeline to the new 930 Reservoir.	CC	WC	535,000	0	0	0	0	0	0	0	0	0	535,000
20	EN13041	RP-5 RW PS Process Control Sys Migration	Project to migrate the RP-5 RW PS to a Rockwell-based system.	CC	WC	0	0	280,000	0	0	0	0	0	0	0	280,000
21	EN15002	1158 Reservoir Site Cleanup Project	Cleanup associated with old piping and associated material.	CC	WC	0	200,000	25,000	0	0	0	0	0	0	0	225,000
22	EN16009	CCWRF RW Flow Equalization	CCWRF RW Flow Equalization	CC	WC	0	0	500,000	0	0	0	0	0	0	0	500,000
23	EN19002	800 Pressure Zone Reservoir	Construction of an 800 pressure zone reservoir in the City of Chino Hills.	CC	WC	0	0	0	0	0	500,000	2,500,000	400,000	0	0	3,400,000
24	EN19003	RP-1 Parallel Outfall Pipeline	This project 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.	CC	WC	0	0	0	0	0	500,000	4,000,000	1,200,000	0	0	5,700,000
25	EN20001	Lower Day Basin Pipeline	Construction of a pipeline to provide recycled water to Lower Day Basin.	CC	WC	0	0	0	0	0	300,000	2,000,000	200,000	25,000	0	2,525,000

#	Project Number[1]	Project Name	Project Description	Project Type[2]	Fund[3]	Fiscal Year Budget (Dollars)										
						2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	Ten-Year Total
26	EN20002	Etiwanda Debris	Etiwanda Debris	CC	WC	0	0	0	0	0	200,000	300,000	0	0	0	500,000
27	EN20003	Montclair Basin Pipeline	Construction of a pipeline to provide recycled water to Lower Day Basin.	CC	WC	0	0	0	0	0	200,000	1,000,000	300,000	0	0	1,500,000
28	EN20004	Brooks Basin Improvements	Brooks Basin Improvements	CC	WC	0	0	0	0	0	200,000	700,000	0	0	0	900,000
29	EN20005	800 PZ-Bottleneck	Project to address hydraulic bottleneck(s) in the 800 pressure zone.	CC	WC	0	0	0	0	0	150,000	500,000	300,000	350,000	0	1,300,000
30	EN21001	Upland Basin	Upland Basin	CC	WC	0	0	0	0	0	0	500,000	300,000	2,200,000	0	3,000,000
31	EN13045	Wineville Extension Pipeline Segment B	A new 24-inch recycled water pipeline along Wineville Ave. from Airport Dr. to Jurupa St. continuing with a new 36-inch recycled water pipeline to RP-3 Groundwater Recharge Basin. The project includes a recycled water turnout to feed RP-3 Basin and a turnout to feed Declez Basin.	CC	WC	3,000,000	8,794,000	0	0	0	0	0	0	0	0	11,794,000
32	EN13048	Second 12 kV Feeder to TP-1	Potential engineering project to provide a second 12 kV feeder to TP-1 to support the RP-1 1158 PS Upgrades.	CC	WC	100,000	1,150,000	0	0	0	0	0	0	0	0	1,250,000
33	WR15019	RP-3 Basin Improvements	Groundwater Recharge Master Plan Update 2013 project #11. IEUA cost share= 50% total cost (committee approved 10/9/13; to board 10/16).	CC	WC	200,000	5,090,000	0	0	0	0	0	0	0	0	5,290,000
34	WR15020	Victoria Basin Improvements	Groundwater Recharge Master Plan Update 2013 project #22a. IEUA cost share= 50% total cost (committee approved 10/9/13; to board 10/16)	CC	WC	24,000	126,000	0	0	0	0	0	0	0	0	150,000
35	WR15021	Napa Lateral	Napa Lateral	CC	WC	50,000	3,150,000	2,800,000	0	0	0	0	0	0	0	6,000,000
36	RW15001	Long-Term Basin-Wide 404 Permitting	Long-Term Basin-Wide 404 Permitting	OM	RW	100,000	15,000	10,000	5,000	0	0	0	0	0	0	130,000
37	EN15034	CM Misc WC Construction & Emergency Proj FY2014/15	CM Misc WC Construction & Emergency Proj FY2014/15	CC	WC	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	2,500,000
38	EN15035	Misc RW Projects FY2014/15	Misc RW Projects FY2014/15	CC	WC	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	2,000,000

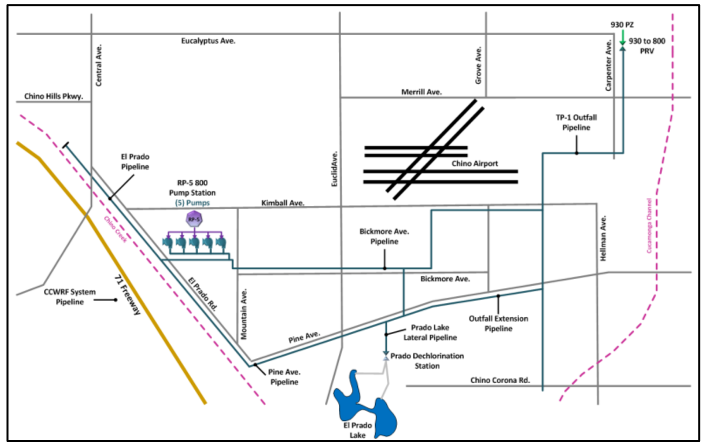
#	Project Number[1]	Project Name	Project Description	Project Type[2]	Fund[3]	Fiscal Year Budget (Dollars)										
						2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	Ten-Year Total
39	RW15002	Upper Santa Ana River Habitat Conservation Plan	Plan for the impact of federal endangered species regulation on future projects. Provide regional coordination of habitat mgmt. opportunities and access to a US Fish & Wildlife Service regional permit.	OM	RW	150,000	10,000	0	0	0	0	0	0	0	0	160,000

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

Asset Management System Summary – RW/GWR

800 Pressure Zone

1. Asset Profile



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 composed of five pumps:

- Two 150 hp vertical-turbine, VFD-driven, 1,925 gpm pumps
- Three 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 feet.
- 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 linear feet (LF) of 30-inch pipeline from the 930 to 800 pressure reducing valve (PRV) to Chino Corona Rd.
- *Outfall Extension Pipeline* – 6,600 LF of 30-inch pipeline along Pine Ave. from the TP-1 outfall pipeline to the Prado Lake lateral, continuing with an additional 6,700 LF of 14-inch pipeline from the Prado Lake lateral to El Prado Golf Course.
- *Prado Lake Lateral Pipeline* – 535 LF of 30-inch pipeline from the outfall extension pipeline continuing with an additional 2,100 LF of 24-inch pipeline to the Prado Lake dechlorination station.
- *Pine Ave. Pipeline* – 2,200 LF of 16-inch pipeline from the El Prado Golf Course to RP-2.
- *El Prado Pipeline* – 12,800 LF of 10-inch pipeline from RP-2 to the Carbon Canyon Water Recycling Facility (CCWRF).
- *Bickmore Pipeline* – Consists of multiple pipeline segments including:
  - 5,500 LF of 18-inch pipeline along Kimball Ave. from the TP-1 outfall pipeline to Rincon Meadows Rd.
  - 5,600 LF of 18-inch pipeline along Rincon Meadows Rd. from Kimball Ave. to Bickmore Ave., continuing with an additional 1,550 LF of 12-inch pipeline from Bickmore Ave. to Pine Ave.
  - 6,300 LF of 30-inch pipeline along Bickmore Ave. from Rincon Meadows Rd. to San Antonio Ave.
  - 2,700 LF of 18-inch pipeline along Bickmore Ave. from San Antonio Ave. to Mountain Ave.
  - 2,500 LF of 18-inch pipeline from the intersection of Mountain Ave. and Bickmore Ave. to RP-5.
  - 1,000 LF of 10-inch pipeline 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 composed of the following main components:

- A 12-inch flow-control sleeve valve with 14-inch magnetic flow meter and pressure transmitter.
- Two 5 gph sodium-bisulfite chemical metering pumps.
- Three 20 gph sodium-bisulfite chemical metering pumps.
- Two upstream chlorine analyzers.
- Two downstream chlorine analyzers biased to measure sodium bisulfite.

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

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
RP-5 800 Pumps	2 @ 1,925 gpm 3 @ 1,925 gpm	VFD Constant
TP-1 Outfall Pipeline	30-inch – 13,200 gpm	6.0 ft/s max velocity (mv)
Outfall Extension Pipeline	30-inch – 13,200 gpm 14-inch – 2,875 gpm	6.0 ft/s mv
Prado Lake Lateral Pipeline	30-inch – 13,200 gpm 24-inch – 8,500 gpm	6.0 ft/s mv
Pine Ave. Pipeline	16-inch – 3,755 gpm	6.0 ft/s mv
El Prado Pipeline	10-inch – 1,500 gpm	6.0 ft/s mv
Bickmore Pipeline	30-inch – 13,200 gpm 18-inch – 4,750 gpm 10-inch – 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

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
RP-5 800 Pumps	1	3	3	2
TP-1 Outfall Pipeline	3	3	3	2
Outfall Extension Pipeline	3	3	3	3
Prado Lake Lateral Pipeline	2	3	3	3
Pine Ave. Pipeline	2	3	3	3
El Prado Pipeline	2	3	3	3
Bickmore Pipeline	1	4	5	2
Prado Sleeve Valve	1	2	2	1
Prado SBS Pumps	1	2	2	1

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Bickmore Pipeline Capacity

At a maximum velocity of 6 ft/s, the 18-inch-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; 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 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
RP-5 800 Pumps	2011	
TP-1 Outfall Pipeline	1976	
Outfall Extension Pipeline	1977	
Prado Lake Lateral Pipeline	1977	
Pine Ave. Pipeline	2004	
El Prado Pipeline	1993	
Bickmore Pipeline	2006	
Prado Sleeve Valve	2011	
Prado SBS Pumps	2011 1996	

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

System Summary Continued on Next Page

Asset Management System Summary – RW/GWR

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
Emergency Generation		
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
Emergency Generation		
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

4. Key Issues for Further Investigation

Electrical System
No issues require specific attention.

Utility Water System
No issues require specific attention.

Potable Water 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
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	

Table 4 Potential Projects

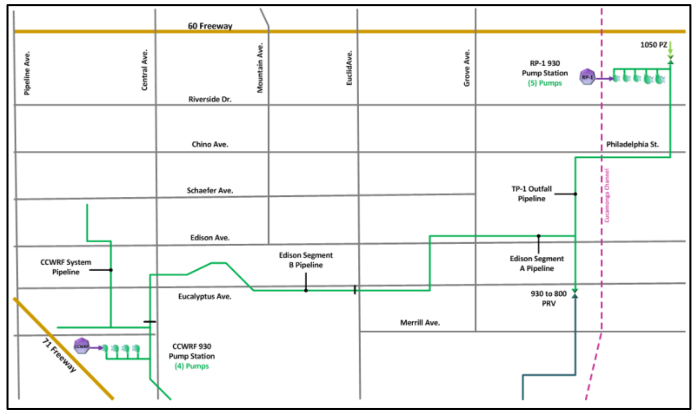
System	Project Name	Project Description
NA	NA	NA

System Summary Continued on Next Page

Asset Management System Summary – RW/GWR

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 (4) 200 hp vertical-turbine, VFD-driven, 2,000 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 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	4 @ 2,000 gpm	VFD
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	3	4	4	3
CCWRF System Pipeline	2	3	3	2
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

4. Key Issues for Further Investigation

TP-1 Outfall Pipeline Capacity
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.

Table 3 History of Select Assets

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

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

System Summary Continued on Next Page

Asset Management System Summary – RW/GWR

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.*

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
Emergency Generation		
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
Emergency Generation		
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	
Emergency Generation		
Generator	N/A	
Instrumentation and Control System		
HMI Workstation	N/A	
RTU	1 unit	4G
PLC	1 unit	
I/O Hub	N/A	
Radio Transmitter	N/A	

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	2	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

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

RP-1 930 Pump Station Emergency Generation

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.

CCWRF 930 Pump Station Emergency Generation

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.

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	

Table 4 Potential Projects

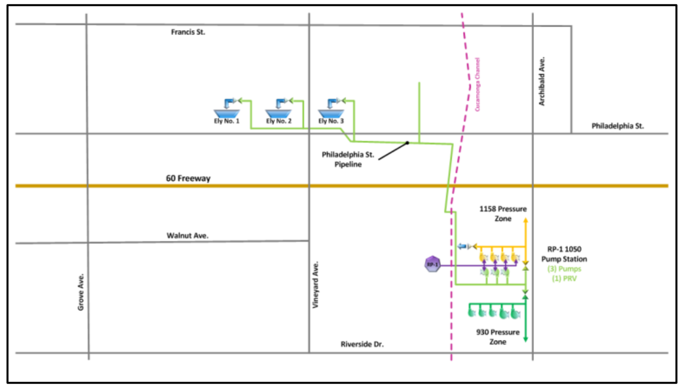
System	Project Name	Project Description
NA	NA	NA

System Summary Continued on Next Page

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	2	3	2	3
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

4. Key Issues for Further Investigation

Ely Basin Turnouts
Remote control of the Ely basin turnouts have been lost, preventing shutdown of recycled water to these basins during low-supply events. Currently, the valves have to be opened and closed locally in the field. Valves need to be repaired to allow remote operation.

Table 3 History of Select Assets

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

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

System Summary Continued on Next Page

Asset Management System Summary – RW/GWR

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	12 kV	
Utility Voltage	2 @ 12 kV to 480 V	
Transformers	2 @ 480 V	
Switchgear	1 @ 480 V	MCCs
Distribution		
Emergency Generation	N/A	
Generator		
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	
Emergency Generation		
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	
Emergency Generation		
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	2	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

4. Key Issues for Further Investigation

RP-1 1050 Pump Station Emergency Generation

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.

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	

Table 4 Potential Projects

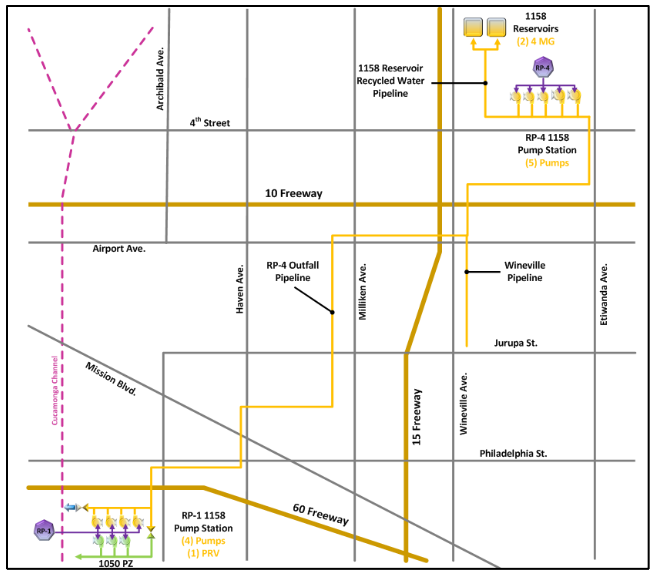
System	Project Name	Project Description
NA	NA	NA

System Summary Continued on Next Page

Asset Management System Summary – RW/GWR

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.

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 dechlorination 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	4	2	1
RP-4 1158 Pumps	2	2	2	3
RP-1 1158 Pumps	2	3	2	3
RP-4 Outfall Pipeline	3	2	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

4. Key Issues for Further Investigation

RP-4 Outfall Pipeline Condition Assessment
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.

Table 3 History of Select Assets

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

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

System Summary Continued on Next Page

Asset Management System Summary – RW/GWR

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. 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 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.*

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

2. Asset Ratings

Table 2 Asset Ratings

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

3. Key Issues for Further Investigation

RP-4 1158 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, 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.

RP-1 1158 Pump Station Emergency Generation

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.

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	

Table 4 Potential Projects

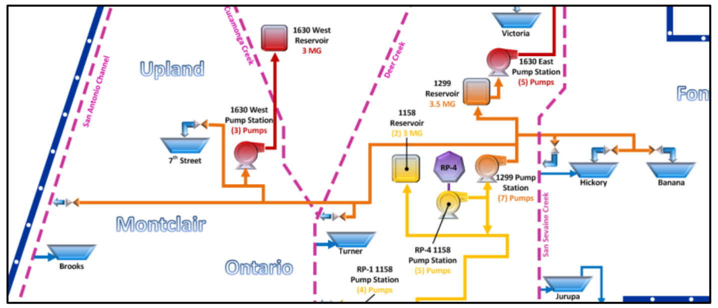
System	Project Name	Project Description
NA	NA	NA

System Summary Continued on Next Page

Asset Management System Summary – RW/GWR

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 (Op. Cap.)
RP-4 1299 Pumps	2 @ 4,185 gpm 5 @ 4,600 gpm	
Etiwanda Pipeline	19,000 gpm	6.0 ft/s max velocity(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	2	1
RP-4 1299 Pumps	2	1	1	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 Pipeline	2	3	2	2
San Antonio Channel Segment B Pipeline	3	3	2	2
7th & 8th St. Pipeline	2	4	2	2
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	4	3
Orchard Turnout	1	2	2	3

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Recycled Water Turnout Functionality
Remote control of the 8th St. turnout and Hickory butterfly valve at FMM has been lost, preventing shutdown of recycled water to these basins during low-supply events. Currently, the valves have to be opened and closed locally in the field. Valves need to be repaired to allow remote operation.

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.

Whittram Ave. Pipeline Capacity
At a maximum velocity of 6 ft/s, the Whittram Ave. pipeline has a capacity of 3,750 gpm. The San Sevaine Channel turnout has a maximum flow of 2,200 gpm, and the FMM turnout has a maximum flow of 6,000 gpm, which exceeds the Whittram Ave. pipeline maximum recommended velocity.

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	
North Etiwanda Pipeline	2008	
Whittram Ave. Pipeline	2004	
1299 Zone Recycled Water Pipeline	2011	
RP-4 West Ext. Phase I Pipeline	2005	
RP-4 West Ext. Phase II Pipeline	C2006	
San Antonio Channel Segment A Pipeline	2007	
San Antonio Channel Segment B Pipeline	2007	
7th & 8th St. Pipeline	2007	
FMM Turnout	2006	
San Sevaine Channel Turnout	2006	
Turner Basin Turnout	2006	
8th St. Basin Turnout	2007	
Orchard Turnout	2007	

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

System Summary Continued on Next Page

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	
Emergency Generation		
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

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.

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	

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

System Summary Continued on Next Page

Asset Management System Summary – RW/GWR

1630 East Pressure Zone

1. Asset Profile

1299 Reservoir (1299 Pressure Zone Asset)
The 1299 reservoir provides recycled water supply to the 1630 east pump station suction header. Both the 1299 reservoir and 1630 east pump station are 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.

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
1299 Reservoir	3.5 MG	2.6 MG (Op. Cap.)
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
1299 Reservoir	1	2	2	1
1630 East Pumps	1	1	2	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

4. Key Issues for Further Investigation

1630 East Surge Tank Compressor
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. A project has been initiated to upsize the existing compressor.

1630 East Pressure Zone Nuisance Flow
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.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
1299 Reservoir	2011	
1630 East Pumps	2011	
1630 East PRVs	2011	
Segment A Pipeline	2011	
Baseline Pipeline	2011	
Church Street Lateral	2011	
Victoria Basin Turnout	2011	
San Sevaine Basin Turnout	2011	

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

System Summary Continued on Next Page

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
Emergency Generation		
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

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	

Table 4 Potential Projects

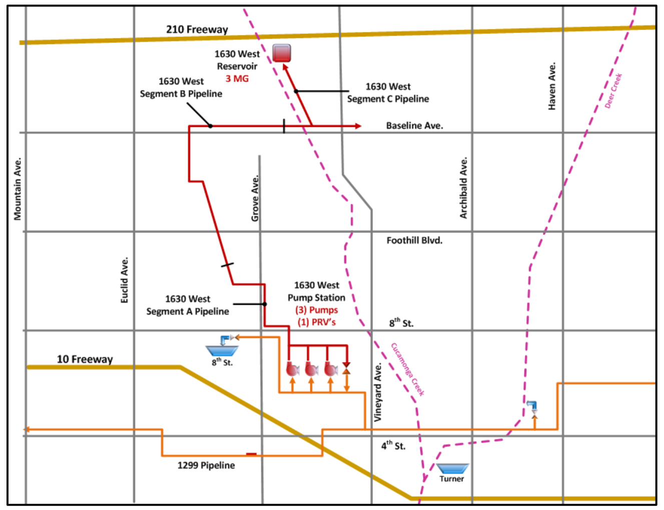
System	Project Name	Project Description
NA	NA	NA

System Summary Continued on Next Page

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, 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	2	2
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

4. Key Issues for Further Investigation

1630 West Pump Station Surge Issue
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.

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	

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

System Summary Continued on Next Page

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
Emergency Generation		
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
Emergency Generation		
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

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	

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

End of System Summary

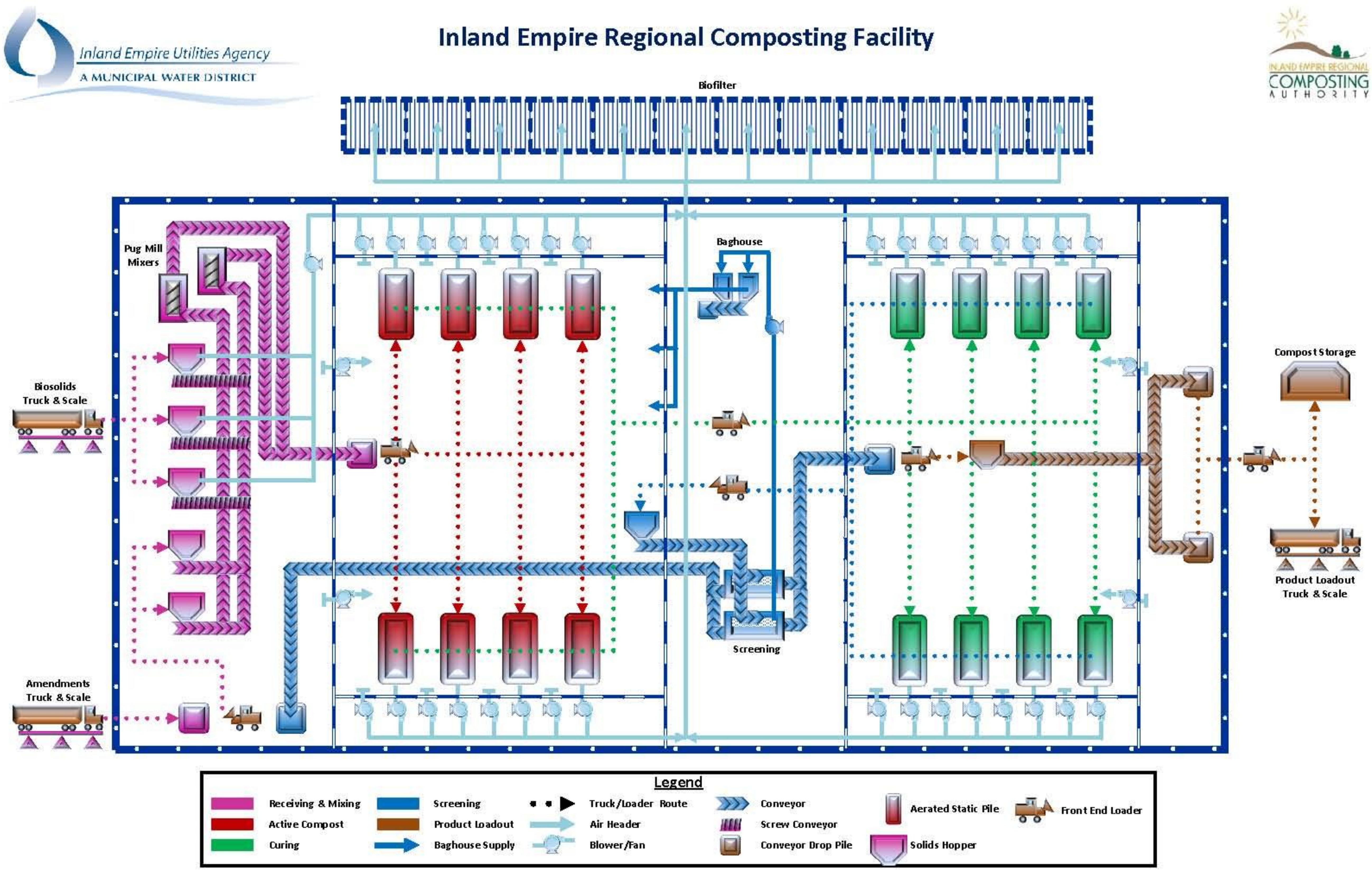


Figure 7-7: Inland Empire Regional Composting Facility (IERCF) – Schematic

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Table 7-8: Inland Empire Regional Composting Facility – Project Summary

#	Project Number[1]	Project Name	Project Description	Project Type[2]	Fund[3]	Fiscal Year Budget (Dollars)										
						2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	Ten-Year Total
1	RA11001	IERCF Capital Replacement	General project for facility/equipment repair and replacement, including replacement of front end loaders, and evaluation of the Baghouse.	RP	RCA	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	5,000,000
2	RA11004	IERCF Process Improvements	The belt conveyance system will be modified to transfer material from Active to Curing, then from Curing to Screening. Currently, the system transfers material from Active to Screening and then Screening to Curing.	CC	RCA	900,000	0	0	0	0	0	0	0	0	0	900,000
3	RA12009	IERCF Structure Protection	Column protection and repair.	OM	RCA	25,000	0	0	0	0	0	0	0	0	0	25,000
4	RA12011	IERCF Lighting Improvements	Additional lighting is going to be installed in all process areas to increase visibility for front end loader operators.	OM	RCA	200,000	200,000	0	0	0	0	0	0	0	0	400,000
5	RA14003	IERCF Receiving Pit & Fan Corridor Drains	Installation of drains in the receiving pit and fan corridors for housekeeping purposes.	CC	RCA	400,000	300,000	0	0	0	0	0	0	0	0	700,000
6	RA14004	IERCF Harmonic Filter AC Improvements	IERCF Harmonic Filter AC Improvements	RP	RCA	5,000	0	0	0	0	0	0	0	0	0	5,000
7	TBD	IERCF Trommel Screen Conversion to Compact Logix PLC	Replace remote I/O with local PLC	RP	RCA	18,000	0	0	0	0	0	0	0	0	0	18,000
8	RA15001	IERCF Baghouse and Dust Collection System Enhancements	IERCF Baghouse and Dust Collection System Enhancements	RP	RCA	200,000	750,000	0	0	0	0	0	0	0	0	950,000

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

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

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

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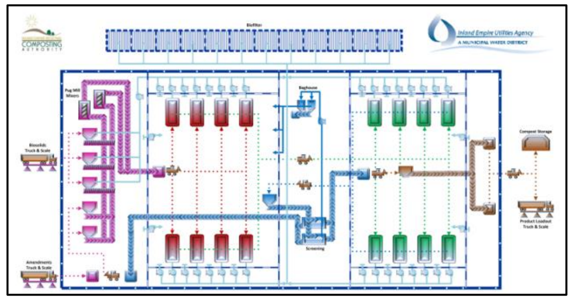
Asset Management System Summary – IERCF

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 (FEL) 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 the following:

- Seven 20 hp, 18,250 cfm fans pulling from receiving and mixing
- Nine 20 hp, 23,000 cfm roof fans
- Five 75 hp, 25,650 cfm fans pulling from screening/Baghouse

Air is exhausted from the active compost area to the biofilter by:

- Four 125 hp, VFD-driven, 35,500 cfm exhaust fans
- Twelve 125 hp, 28,400 cfm exhaust fans
- Twenty-two 30 hp, VFD-driven, 4,500 cfm process fans

Curing HVAC
Supply air into the curing process area is provided by:

- Four 25 hp, 20,500 cfm fans pulling from product loadout
- Five 10 hp, 18,000 cfm roof fans
- Fourteen 20 hp, 2,850 cfm process fans

Air is exhausted from the active compost area to the biofilter by:

- Four 150 hp, VFD-driven, 42,250 cfm exhaust fans
- Two 125 hp, 35,000 cfm 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 a 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.

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)
Screening Belt Conveyors	2 @ 20 hp, 91', 150 tph 1 @ 15 hp, 133', 150 tph 2 @ 15 hp, 27', 150 tph 1 @ 25 hp,157', 190 tph 1 @ 25 hp, 136', 190 tph 1 @ 15 hp, 32', 110 tph 1 @ 15 hp, 77', 110 tph 1 @ 20 hp, 172', 110 tph 1 @ 30 hp, 537', 110 tph	
Product Loadout Belt Conveyors	1 @ 20 hp, 135', 145 tph 1 @ 15 hp, 113', 145 tph	
Active Compost HVAC	7 @ 20 hp, 18,250 cfm 9 @ 20 hp, 23,000 cfm 5 @ 75 hp, 25,650 cfm 4 @ 125 hp, 35,500 cfm 12 @ 125 hp, 28,400 cfm 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	813,200 cfm	

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	2	3	2	2
Pug Mill Mixers	3	2	2	3
Receiving & Mixing Belt Conveyors	2	2	2	3
Screening Belt Conveyors	4	3	3	3
Product Loadout Belt Conveyors	4	3	3	3
Active Compost HVAC	2	3	3	2
Curing HVAC	4	3	3	2
Trommel Screens	3	3	4	4
Baghouse	5	4	4	4
Biofilter	4	2	3	3

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Trommel Screen Operation
The Trommel screens have required monthly maintenance because of parts failures resulting in extended equipment downtime. IERCF is currently running a pilot study of a shaker screen to gather operational data on the effectiveness of this type of equipment. Based upon the findings of this study, a pre-design should be completed to investigate the best option for modifying/replacing the Trommel screens.

Baghouse Operation
The Baghouse operation has been ineffective in removing particulate matter from the Trommel screens and screenings process area. IERCF had to construct a temporary cover around the exhaust of the Trommel screens to allow adequate supply air flow to the Baghouse. In addition, concerns have been raised about the applicability of an indoor Baghouse as it relates to OSHA requirements. An initial study should be completed to review options for modifying or replacing the Baghouse.

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	
Screening Belt Conveyors	2007	
Product Loadout Belt Conveyors	2007	
Active Compost HVAC	2007	
Curing HVAC	2007	
Trommel Screens	2007 2013	
Baghouse	2007	
Biofilter	2007	

Table 4 Potential Projects

System	Project Name	Project Description
Facility Wide	Locker Room HVAC Improvements	Improve locker room HVAC.
Active Curing Screening	Transition Air Duct Improvements	The foul-air rectangular-transition air duct running north/south through screenings has multiple air leaks at the joints. This project will improve the system to prevent such leaks in the future.
Biofilter	IERCF Biofilter Media Replacement	Full replacement of the biofilter media in all 12 cells, recurring every 5 years.
Biofilter	IERCF Biofilter Media Replenishment	Turnover of existing biofilter media and replenishment of material as necessary, annually. This will not be conducted on years of a full media replacement.

System Summary Continued on Next Page

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.

Emergency Generation
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. A yard piping diagram is show in Appendix C.

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 Transformers Switchgear Distribution Emergency Generation Generator Mounted Lighting	 12 kV 4 @ 12 kV to 480 V 5 @ 480 V to 120 V 4 @ 12 kV 2 @ 12 kV 8 @ 480 V 1 @ 2,000 kW 2,937 Bhp 345 units	 MCCs Process
Utility Water System Pipelines Valves	 8-inch PVC @ 3,750 gpm 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 RTU PLC I/O Hub Radio Transmitter	 4 units N/A 4 units 6 units 1 unit	 RP-4
Yard Piping	See Appendix C	

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	3	2	3	3
Instrumentation and Control System	3	2	3	3
Yard Piping	3	3	3	3

* Ratings as defined in Appendix A

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
No issues require specific attention.

Instrumentation and Control System
No issues require specific attention.

Yard Piping
No issues require specific attention.

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	

Table 4 Potential Projects

System	Project Name	Project Description
Facility Wide	DCS Network Equipment Replacement	Recurring project every 5 years to replace network equipment.
Facility Wide	DCS Notebook & PC Workstation Replacement	Recurring project 5 year to replace computers and workstations.
Facility Wide	Tablet PC Replacement	Recurring project every 10 years to replace tablets.
Facility Wide	Server Replacement	Recurring project every 10 years to replace servers.

End of System Summary

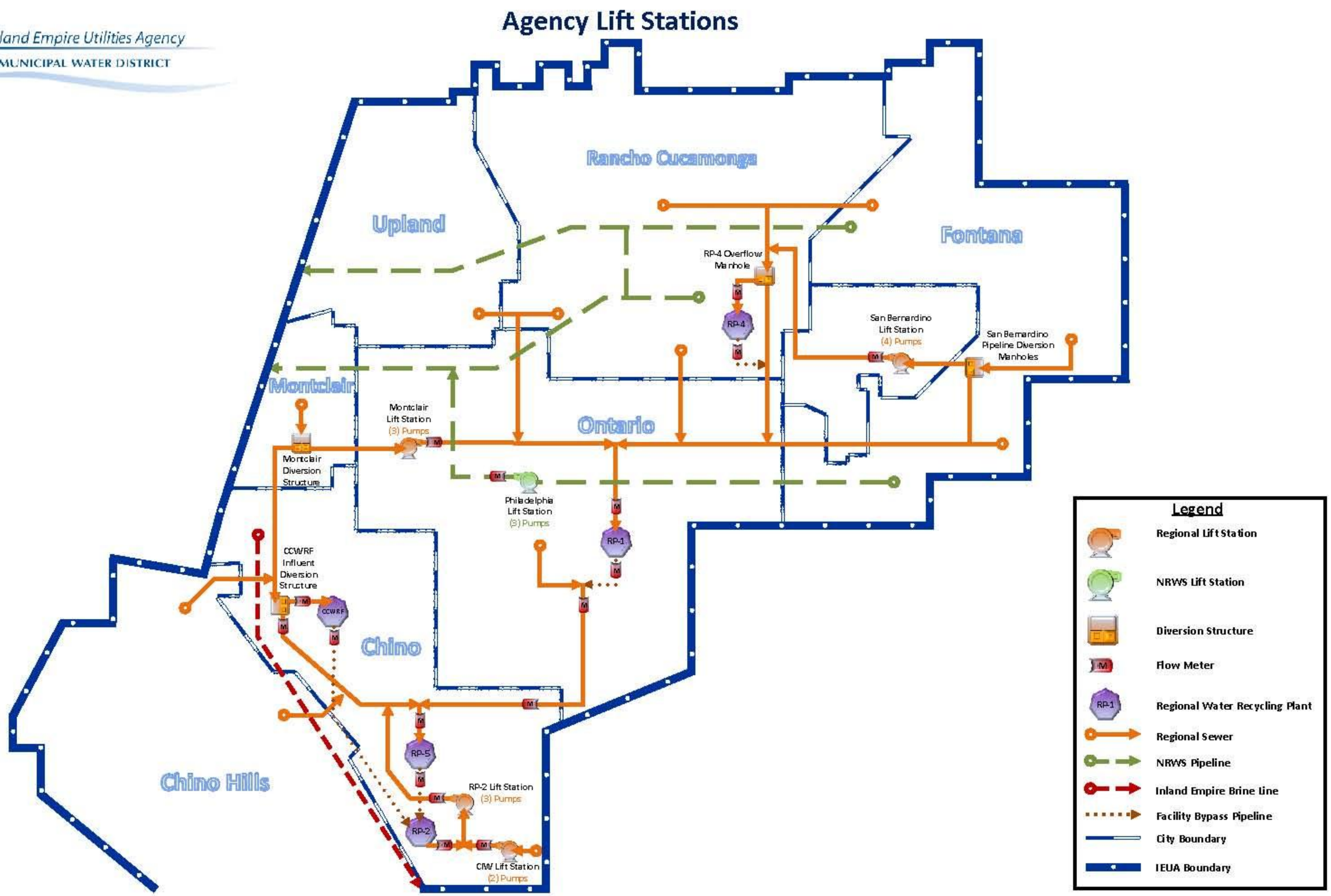


Figure 7-8: Agency Lift Stations (LS) – Schematic

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Table 7-9: Agency Lift Stations – Project Summary

#	Project Number[1]	Project Name	Project Description	Project Type[2]	Fund[3]	Fiscal Year Budget (Dollars)										
						2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	Ten-Year Total
1	EN11035	Philadelphia Pump Station Upgrades	Repair and replacement of section of the force mains in the pump dry sump. Miscellaneous instrumentation and facility improvements will be made. A redundant PLC will also be supplied to provide control system reliability.	CC	NC	1,400,000	574,000	0	0	0	0	0	0	0	0	1,974,000
2	EN16011	Whispering Lakes LS Improvements	Complete rehab of lift station.	CC	RC	0	0	0	0	300,000	2,700,000	0	0	0	0	3,000,000
3	EN19005	Haven LS SCADA Improvements	Connect to the SCADA enterprise system and potential sewer construction	CC	RC	0	0	0	0	300,000	2,700,000	0	0	0	0	3,000,000
4	EN13054	Montclair Lift Station Upgrades	Replacement of all three lift pumps as well as replacement and improvements of the control and instrumentation system and the electrical distribution system.	CC	RO	2,500,000	415,000	0	0	0	0	0	0	0	0	2,915,000

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

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

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

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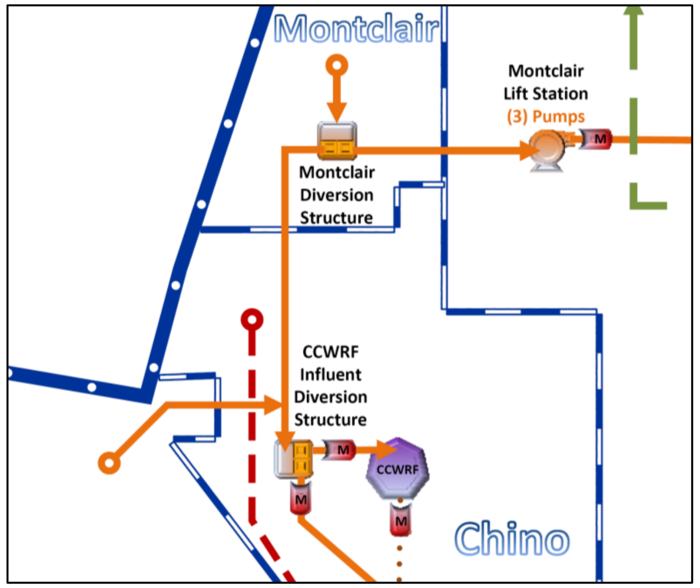
Asset Management System Summary – LS

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.

Emergency Generation
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 Emergency Generation 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	3
Potable Water System	3	3	3	3
Instrumentation and Control System	3	3	3	3

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Pump System
Project EN13054 will address replacing the lift station pumps to reduce ragging and maintenance labor. The pumps were selected for their ability to resist clogging from rags and other large objects. However, the need for grinders to be placed in front of the pumps will be evaluated to further increase reliability if needed.

Emergency Generation
After the lift station upgrade, the backup generator capacity no longer matches the capacity of the utility service. The backup generator may need to be upgraded to a unit with a higher capacity.

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	

Table 4 Potential Projects

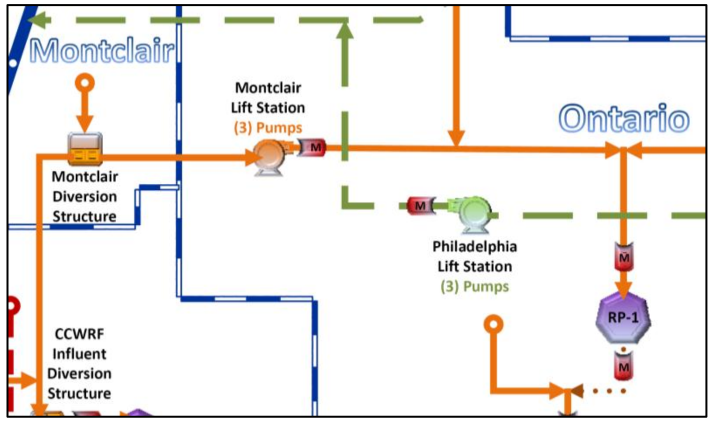
System	Project Name	Project Description
Pump System	Montclair Lift Station Grinder Improvement	If continued ragging of pumps is experienced upon starting up the new pumping system, grinders will be installed ahead of the pumps to prevent further clogging of the pumps.
Emergency Generator	Montclair Lift Station Emergency Generator Replacement	The backup generator will need to be replaced with a larger capacity unit to allow all three lift pumps to operate simultaneously when flows increase to the station.
Facility	Montclair Lift Station Rehabilitation	Recurring project every 10 to 15 years to inspection and rehabilitation of the wet well and concrete structures, piping, pumps, and other ancillary equipment.

System Summary Continued on Next Page

Asset Management System Summary – LS

Philadelphia Lift Station

1. Asset Profile



Pump System
The Philadelphia lift station conveys non-reclaimable waste (NRW) collected from the northern half of the Agency service area to Los Angeles County. The lift station includes three pumps: two variable speed and one 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.

Emergency Generation
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 Emergency Generation 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	3	3	3	3
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	4	3	3
Chemical Injection	4	3	4	4

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Pump System
Suction piping is showing signs of wear. Project EN11035 will repair and replace sections of pipeline from the wet well.

Force Mains
The force mains have experienced substantial degradation in capacity. The pipelines are being evaluated to determine if they can be repaired or need to be replaced. A potential engineering project is required to provide inspection manholes on the 18-inch pipeline as well as on a backup 18-inch pipeline.

Project EN11035 will increase the diameter of the force main to allow future discharge capacity, as well as install control valves to optimize flows at the station.

Electrical System
No issues require special attention.

Utility Water System
No issues require special attention.

Instrumentation and Control System
The PLC does not include any redundancy. The control system needs to be upgraded to include redundancy and increase reliability. Project EN11035 will improve miscellaneous instrumentation at the station.

Chemical Injection
Ferric feed pumps are not flow placed, leading to inefficient dosing throughout the day. A potential engineering project is needed to upgrade the chemical feed pumps.

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	

Table 4 Potential Projects

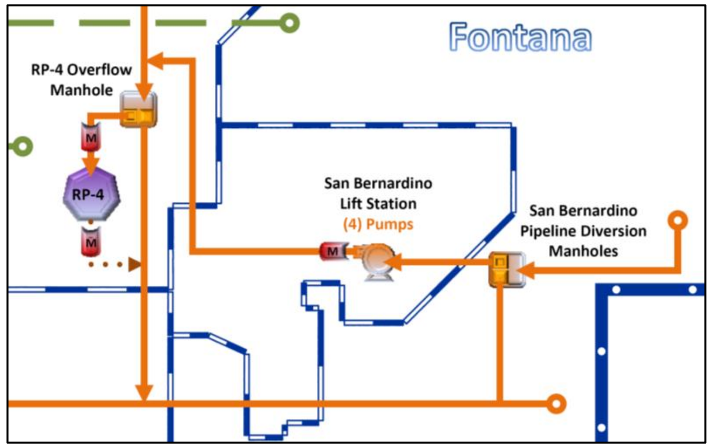
System	Project Name	Project Description
Pump System	Philadelphia Lift Station Force Main improvements	Repair or replace the existing force mains.
Facility	Philadelphia Lift Station Rehabilitation	Recurring project every 10 to 15 years to inspection and rehabilitation of the wet well and concrete structures, piping, pumps, and other ancillary equipment.

System Summary Continued on Next Page

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.

Emergency Generation
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 Pump Station Valves Seal Water Tank Seal Water Pumps	 30-inch 5,902 gpm 24-inch 13,890 gpm 2 @ 3,300 gpm 50 hp 2 @ 6,945 gpm 125 hp 7 units 1 @ 2,900 Gal. 1 @ 50 Gal. 2 Ea.	 Secondary Primary
Electrical System Utility Voltage Transformers Switchgear Distribution Emergency Generation Generator Mounted Lighting	 12 kV 12 kV to 480 V 480 V 480 V 1 @ 500 kW 757 Bhp 19 units	
Potable Water System Backflow Devices Valves	 1 units 2 units	
Instrumentation and Control System HMI Workstation RTU PLC I/O Hub	 1 Ea. 2 Ea. 2 Ea. 2 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
Potable Water System	3	3	3	3
Instrumentation and Control System	3	3	3	3

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Pump System
Currently no issues require special attention.

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	

Table 4 Potential Projects

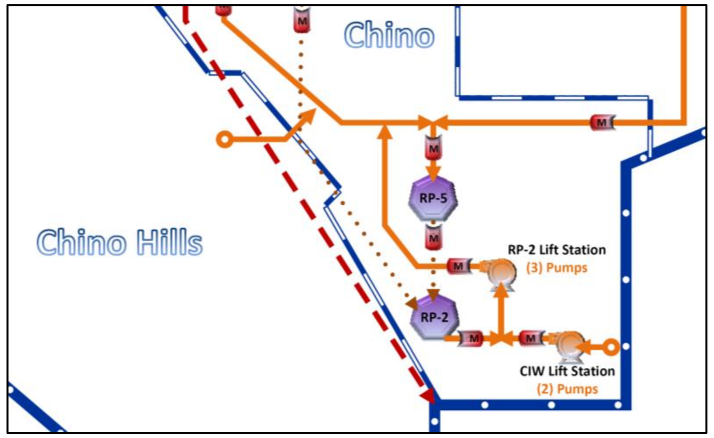
System	Project Name	Project Description
Facility	San Bernardino Avenue Lift Station Rehabilitation	Recurring project every 10 to 15 years to inspection and rehabilitation of the wet well and concrete structures, piping, pumps, and other ancillary equipment.

System Summary Continued on Next Page

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.

Emergency Generation
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 Emergency Generation 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.	
Yard Piping	See Appendix C	

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

4. Key Issues for Further Investigation

Pump System
Currently no issues require special attention.

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	

Table 4 Potential Projects

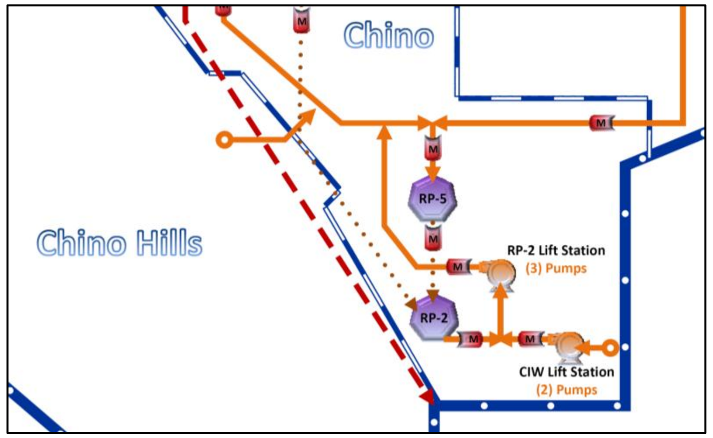
System	Project Name	Project Description
Facility	RP2 Lift Station Rehabilitation	Recurring project every 10 to 15 years to inspection and rehabilitation of the wet well and concrete structures, piping, pumps, and other ancillary equipment.

System Summary Continued on Next Page

Asset Management System Summary – LS

Chino Institute for Woman (CIW)

1. Asset Profile



Pump System
The CIW (or Prado) lift station serves the Chino Institute for Women Correctional Facility as well as Prado Park. The lift station consists of a small circular wet well with two submersible chopper pumps and a sewage grinder.

The area surrounding the CIW lift station has recently undergone development. The area, known as the Preserve, is currently bypassing sewage to the Inland Empire Brine Line and conveying it to Orange County. The City of Chino is designing and will construct a new lift station to convey the Preserve area flows to RP-5. The new lift station will also handle the flows lifted by the CIW, and the CIW lift station will be abandoned. The City of Chino will own the new lift station and reimburse the Agency for the operation and maintenance of the facility.

Instrumentation and Control System
The lift station is provided with local controls only. A control panel is tied to float switches and a sonic level transmitter to locally start and stop the pumps.

2. Capacity Profile

Table 1 Capacity by System

System Subsystem(s)	Design Capacity (Dry Weather Average)	Notes
CIW Lift Station	1 MGD	
Pump System Pipelines Pump Station Sewage Grinder	 8-inch 1,300 gpm 2 @ 650gpm 30 hp 1 Ea.	
Electrical System Utility Voltage Transformers Distribution	 4,160 V 4,160 V to 480 V 480 V	
Instrumentation and Control System Control Panel	 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	4	4	3

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation

Pump System
The City of Chino plans to replace the pump station to accommodate flows from the recently developed area known as the Preserve. This lift station would be abandoned upon completion of the new lift station.

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.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Pump System	1976 1993	
Electrical System	1976 1993	
Instrumentation and Control System	1976 1993	

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

End of System Summary

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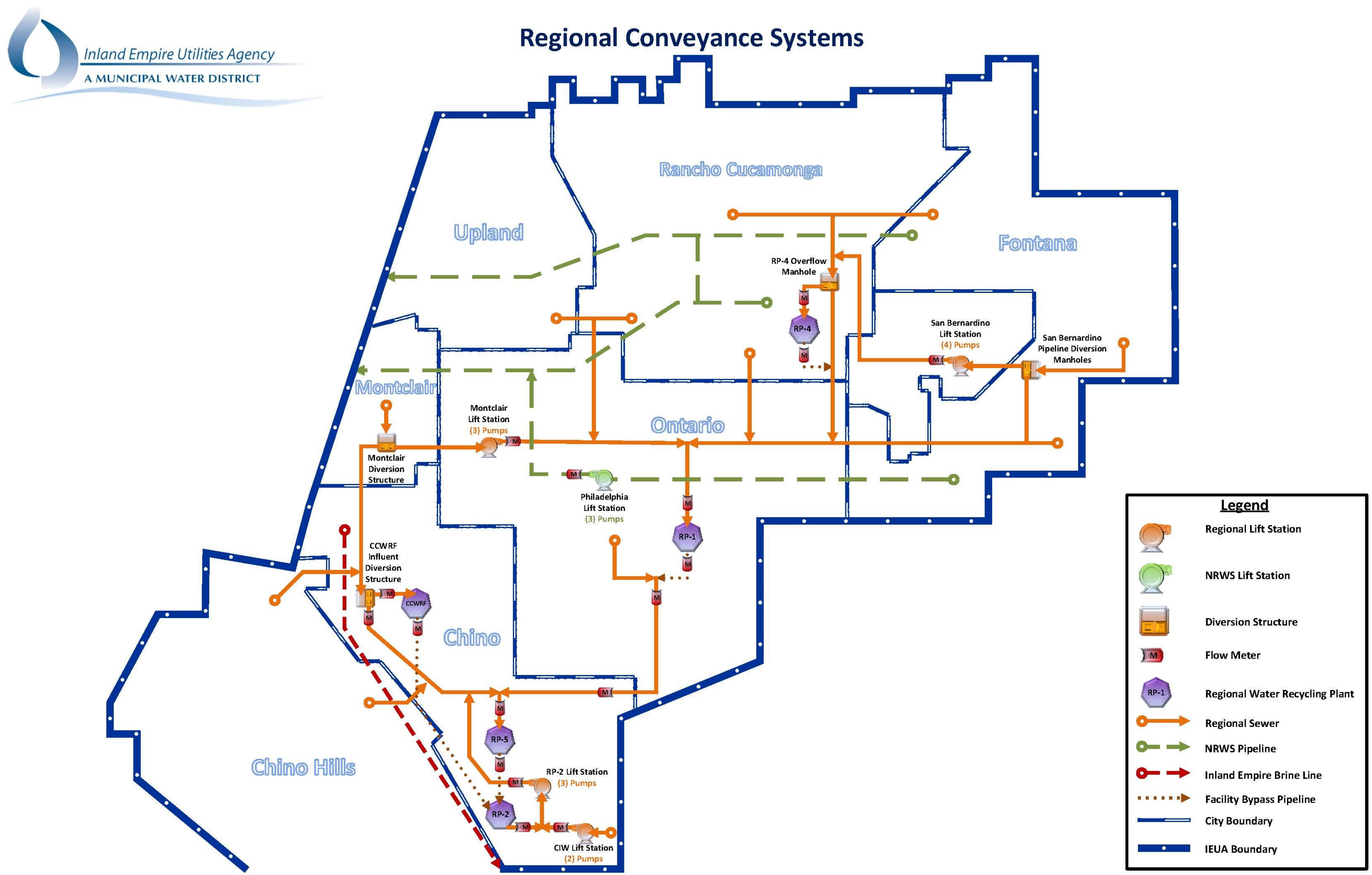

Figure 7-9: Regional Conveyance System (RC) – Schematic

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Table 7-10: Regional Conveyance System – Project Summary

#	Project Number[1]	Project Name	Project Description	Project Type[2]	Fund[3]	Fiscal Year Budget (Dollars)										
						2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	Ten-Year Total
1	EN14035	22-inch Manholes Along NRW North System North Trunk (NSNT) Rehab	22-inch Manholes Along NRW North System North Trunk (NSNT) Rehab	CC	NC	450,000	163,000	0	0	0	0	0	0	0	0	613,000
2	EN22002	NRW East End Flowmeter Replacement	Flowmeter replacement required by NRWS Agreement.	CC	NC	0	0	0	0	0	0	0	0	45,000	255,000	300,000
3	EN14037	Fontana Interceptor Relief Sewer Manholes Rehab	Fontana Interceptor Relief Sewer Manholes Rehab	CC	RC	600,000	610,000	0	0	0	0	0	0	0	0	1,210,000
4	EN14050	Collection System Repairs Phase V, Westside Interceptor	Collection System Repairs Phase V, Westside Interceptor	CC	RC	400,000	100,000	0	0	0	0	0	0	0	0	500,000
5	CW15015	NRW OE Projects FY2014/15	Annual Allocation for NRW Office engineering projects.	OM	NC	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	100,000
6	EN15024	NRW Conn & Emergency Projects FY2014/15	Fund unforeseen NRW projects that require immediate attention.	CC	NC	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	1,000,000
7	EN15025	CM Misc NRWS Constr & Emergency Proj FY2014/15	Fund NRWS projects that require immediate attention.	CC	NC	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	2,500,000
8	EN15031	Regional Sewer Special Projects FY2014/15	Fund contingency small regional sewer repairs, construction permits, and inspection of improvement projects requested by contracting agencies.	CC	RC	100,000	0	0	0	0	0	0	0	0	0	100,000
9	CW15019	Sewer OE Projects FY2014/15	Annual Allocation for sewer Office engineering projects.	CC	RC	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	500,000
10	EN15029	Misc RC Constr & Emergency Proj FY2014/15	Fund unforeseen regional capital improvement projects that require immediate attention.	CC	RC	250,000	0	0	0	0	0	0	0	0	0	250,000
11	EN15030	CM Misc RC Constr & Emergency Proj FY2014/15	Fund unforeseen Wastewater Capital Improvement Fund projects that require immediate attention.	CC	RC	250,000	0	0	0	0	0	0	0	0	0	250,000

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

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Asset Management System Summary – RC

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	3.1 ft/s
	36-inch – 18.1 MGD	2.9 ft/s
	30-inch – 21.5 MGD	2.0 ft/s
	24-inch – 11.9 MGD	2.3 ft/s
	20-inch – 8.3 MGD	6.0 ft/s
	18-inch – 7.4 MGD	6.0 ft/s
Cucamonga Interceptor Relief	81-inch – 254 MGD	6.2 ft/s
	72-inch – 105 MGD	4.0 ft/s
	60-inch – 214 MGD	6.0 ft/s
	54-inch – 71.8 MGD	5.6 ft/s
Cucamonga Interceptor	84-inch – 238 MGD	6.0 ft/s
	72-inch – 158 MGD	5.6 ft/s
	42-inch – 21.2 MGD	2.0 ft/s
	27-inch – 15.3 MGD	6.0 ft/s
Cucamonga Trunk Relief	39-inch – 29.5 MGD	4.4 ft/s
	36-inch – 34.6 MGD	5.8 ft/s
	33-inch – 34.0 MGD	6.0 ft/s
	30-inch – 29.9 MGD	5.6 ft/s
	27-inch – 30.4 MGD	6.0 ft/s
	24-inch – 23.4 MGD	5.2 ft/s
Etiwanda Trunk	42-inch – 41 MGD	3.0 ft/s
	36-inch – 45 MGD	7.0 ft/s
	30-inch – 28 MGD	5.0 ft/s
	27-inch – 14 MGD	5.0 ft/s
	24-inch – 18 MGD	7.0 ft/s
	21-inch – 14 MGD	6.0 ft/s
	18-inch – 6 MGD	6.0 ft/s
Fontana Interceptor	39-inch – 15.9 MGD	1.7 ft/s
	36-inch – 19.4 MGD	2.1 ft/s
	33-inch – 11.1 MGD	
	21-inch – 10.8 MGD	
	18-inch – 12.7 MGD	
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	5.8 ft/s
	60-inch – 58 MGD	3.6 ft/s
	30-inch – 7 MGD	1.2 ft/s
	27-inch – 6.7 MGD	1.2 ft/s
	24-inch – 9 MGD	2.0 ft/s
	21-inch – 8.5 MGD	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	5.4 ft/s
	30-inch – 31.5 MGD	7.8 ft/s
	27-inch – 16.1 MGD	5.9 ft/s
	24-inch – 13.1 MGD	5.7 ft/s
	21-inch – 15.9 MGD	7.0 ft/s
	18-inch – 7.4 MGD	3.6 ft/s
	15-inch – 5.2 MGD	4.3 ft/s
Montclair Lift Force Main	18-inch	
San Bernardino Lift Force Main		

3. Asset Ratings *(to be developed in future updates)*

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Archibald Trunk				
Cucamonga Interceptor Relief				
Cucamonga Interceptor				
Cucamonga Relief				
Etiwanda Trunk				
Fontana Interceptor				
Fontana Interceptor Relief				
Freeway Trunk				
Grove Avenue Outfall				
Montclair Interceptor				
Turner Trunk				
Upland Interceptor				
Upland Interceptor Relief				
Montclair Lift Force Main				
San Bernardino Lift Force Main				

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation *(to be developed in future updates)*

Table 3 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 Bernardino Lift Force Main		

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

System Summary Continued on Next Page

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.
- CIW/Prado Park Lift 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
CIW/Prado Park Lift		
RP-2 Lift Station Force Main		

3. Asset Ratings *(to be developed in future updates)*

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
Chino Interceptor				
Eastern Trunk Sewer				
Kimball Interceptor				
Los Serranos Trunk				
Westside Interceptor				
Westside Interceptor Relief Sewer				
CIW/Prado Park Lift				
RP-2 Lift Station Force Main				

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation *(to be developed in future updates)*

Table 3 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		

Table 4 Potential Projects

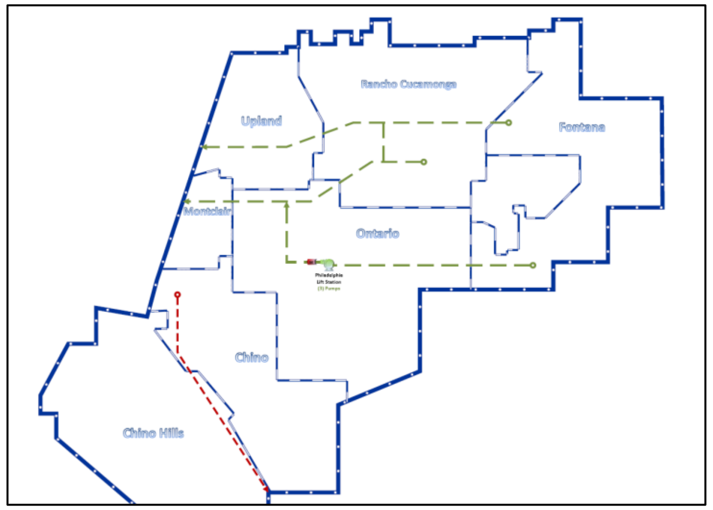
System	Project Name	Project Description
NA	NA	NA

System Summary Continued on Next Page

Asset Management System Summary – RC

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, which collect industrial wastewater discharges 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 runing 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)	Notes
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 *(to be developed in future updates)*

Table 2 Asset Ratings

System	Rating Scale* 1 = Excellent; 5 = Poor			
	Condition	Redundancy	Function	Reliability
North System North Trunk	3	2	2	2
North System Center Trunk				
North System South Trunk				
Edison Waste Line				
Cucamonga Creek Trunk				
Philadelphia Lift Force Main	2	2	2	2
Inland Empire Brine Line	3	3	3	3

* Ratings as defined in Appendix A

4. Key Issues for Further Investigation *(to be developed in future updates)*

North System North Trunk

North System Center Trunk

North System South Trunk

Edison Waste Line

Cucamonga Creek Trunk

Philadelphia Lift Force Main

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 3 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

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

<u>End of System Summary</u>

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Agency Laboratory

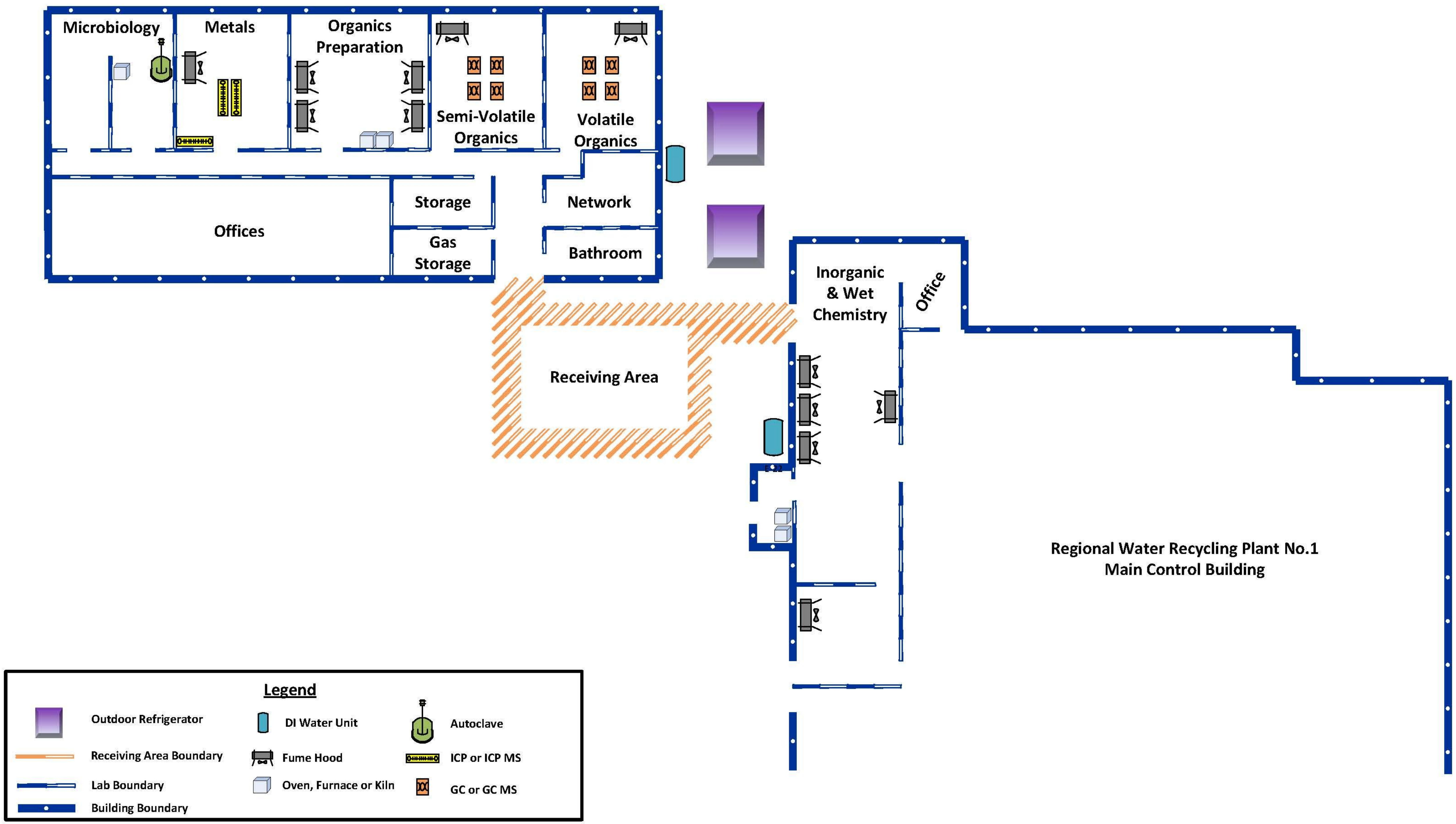

Figure 7-10: Agency Laboratory (Lab) – Schematic

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Table 7-11: Agency Laboratory – Project Summary

#	Project Number[1]	Project Name	Project Description	Project Type[2]	Fund[3]	Fiscal Year Budget (Dollars)										
						2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	Ten-Year Total
1	EN15008	New Water Quality Laboratory	This project will replace the existing operation laboratory at RP-1. A possible site location will be south of Headquarters at RP-5.	CC	RO	0	0	1,100,000	10,000,000	6,000,000	0	0	0	0	0	17,100,000
2	EN15007	New Lab Equipment (New Lab)	New lab equipment (GCMS, Liquid Chromatography), depends on new lab construction.	CC	RO	0	0	0	650,000	0	0	0	0	0	0	650,000
3	EN15006	Lab Equipment Replacement	Replacement of obsolete equipment in the Metals & Organic Chemistry, Inorganic & Wet Chemistry, and Microbiology Labs.	CC	RO	0	50,000	0	0	50,000	0	0	50,000	0	0	150,000
4	LB14003	Autoclave	This project will replace the Autoclave in the Microbiology	EQ	RC	17,500	0	0	0	0	0	0	0	0	0	17,500
5	LB14001	Pesticide GC Replacement	This project will replace the GC in the Metals & Organics Lab.	EQ	RC	100,000	0	0	0	0	0	0	0	0	0	100,000

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

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

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

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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.1 in Ontario. 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 two phases: Phase 1 included a 1,900-square-foot laboratory space, and Phase 2 included a 4,300 square-foot-building. 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 three groups: Wet Chemistry, Metals & Organic Chemistry, and Bioassay & 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 the expanded Phase 2 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 original Phase 1 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 expanded Phase 2 building. 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	1 @ 100 fpm	Min
ICP	2 @ 157 sample batch	Max
ICP MS	1 unit	
Mercury Analyzer	1 @ 62 sample batch	Max
Auto Block Digester	1 @ 54 sample batch	Max
Peristaltic Pump	2 units	
Organics Preparation:		
Fume Hood	4 @ 100 fpm	Min
Extractor System	3 units; 1 controller	
Kiln	1 @ 450°C	
Oven	1 @ 300°C	
Evaporator	3 @ 300 ml 2 @ 50 or 200 ml	
Dishwasher	2 units	
Semi-Volatile Organics:		
Fume Hood	1 @ 100 fpm	Min
GC	2 @ 25 min per sample	Max
GC MS	2 @ 25 min per sample	Max
Volatile Organics:		
Fume Hood	2 @ 100 fpm	Min
GC	2 units	
Concentrator	2 @ 51 sample batch	Max
Auto Sampler	2 units	
Refrigerator	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 41°F	
Inorganic & Wet Chemistry		
Fume Hood	6 @ 100 fpm	Min
Oven	2 @ 180°C 2 @ 104°C	
Furnace	2 @ 550°C	
Incubator	2 @ 20°C	
TOC Analyzer	1 @ 70 sample batch 1 @ 75 sample batch	Max Max
Ion Chromatograph	2 @ 49 sample batch	Max
Colorimeter	1 @ 120 sample batch	Max
Auto Colorimeter	2 unit	
Auto Sampler	2 @ 120 sample batch	Max
Auto Titrator	1 @ 36 sample batch	Max
Nano Pure Filter	1 unit	
Dishwasher	2 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 41°F	
Microbiology		
Autoclave	1 @ 35°C 1 @ 120°C	
Incubator	2 @ 35°C	
Water Bath	1 @ 44.5°C	
Oven	2 @ 180°C	
Temp. Control	1 unit	
Nano Pure Filter	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

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. A contract is required for equipment for routine maintenance activity as recommended by the manufacturer; these contracts are expensive.

The GC and ICP-MS units have no redundancy. Project LB14001 and LB14002 are budgeted to replace both pieces of equipment through the Lab. The existing ICP-MS is fifteen years old, well past the expected life expectancy, and replacement is necessary. The ICP-MS is a critical piece of equipment and must be replaced prior to failure. The GC is currently being operated until failure.

A planned project through the Lab will replace obsolete equipment every ten years.

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. Project EP13003 through the Maintenance Department will paint the walls and replace damaged tiles.

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. A contract is required for equipment for routine maintenance activity as recommended by the manufacturer; these contracts are expensive.

The TOC Analyzer fails frequently, requiring the use of a service contract.

A planned project through the Lab will replace obsolete equipment every ten years

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 Laboratory is transferring funds to purchase a new autoclave, because the current Autoclave fails.

A planned project through the Lab will replace obsolete equipment every ten years

A planned engineering project will construct a new laboratory by 2018.

Table 3 History of Select Assets

System	Capital Improvement Project Activity	Condition Assessment Report
Metals & Organic Chemistry	1997	2005
Inorganic & Wet Chemistry	1979	2005
Microbiology	1997	2005

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

End of System Summary

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Agency Headquarters

Figure 7-11: Agency Headquarters – Schematic

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Table 7-12: Agency Headquarters – Project Summary

#	Project Number[1]	Project Name	Project Description	Project Type[2]	Fund[3]	Fiscal Year Budget (Dollars)										
						2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	Ten-Year Total
1	EN14002	CIPO Enhancements	Construction Management tracking software upgrades.	EQ	GG	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	150,000
2	IS10025	SAP Public Sector Budget Prep App	SAP Public Sector Budget Prep Application	EQ	GG	0	200,000	0	0	0	0	0	0	0	0	200,000
3	EN21002	Chino Creek Wetlands and Educational Park Upgrades	Grant-dependent project to facilitate the education program and increase community involvement, the Park needs three Ramadas with educational signage, a restroom/storage facility and the construction of a previous parking lot with additional signage.	CC	RO	0	0	0	0	0	0	900,000	958,000	0	0	1,858,000
4	EN15033	CIPO Enhancements FY2014/15	CIPO Enhancements FY2014/15	EQ	GG	15,000	0	0	0	0	0	0	0	0	0	15,000
5	WR15002	CBWCD Landscape Audit & Monitoring Program	CBWCD Landscape Audit & Monitoring Program	RE	WW	40,000	0	0	0	0	0	0	0	0	0	40,000
6	WR15004	Garden In Every School	Garden In Every School	OM	WW	45,000	0	0	0	0	0	0	0	0	0	45,000
7	WR15005	Residential Landscape Device Retrofit Program	Residential Landscape Device Retrofit Program	RE	WW	400,000	0	0	0	0	0	0	0	0	0	400,000
8	WR15007	Residential Rebate Incentives	Residential Rebate Incentives	RE	WW	75,000	0	0	0	0	0	0	0	0	0	75,000
9	WR15008	IEUA Regional Education Program	IEUA Regional Education Program	OM	WW	70,000	0	0	0	0	0	0	0	0	0	70,000
10	WR15009	CII Rebate Incentive	CII Rebate Incentives	OM	WW	75,000	0	0	0	0	0	0	0	0	0	75,000
11	WR15011	Freesprinklernozzles .com Program	Freesprinklernozzles.com Program	RE	WW	243,750	0	0	0	0	0	0	0	0	0	243,750
12	WR15013	Sponsorships & Public Outreach	Sponsorships & Public Outreach	OM	WW	80,500	0	0	0	0	0	0	0	0	0	80,500
13	WR15015	Residential Landscape Training Classes	Residential Landscape Training Classes	OM	WW	15,000	0	0	0	0	0	0	0	0	0	15,000
14	WR15017	Landscape Transformation Program	Landscape Transformation Program	RE	WW	300,000	0	0	0	0	0	0	0	0	0	300,000

#	Project Number[1]	Project Name	Project Description	Project Type[2]	Fund[3]	Fiscal Year Budget (Dollars)										
						2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	Ten-Year Total
15	WR15018	IEUA WUE Model Update & Workshops	IEUA WUE Model Update & Workshops	OM	WW	7,000	0	0	0	0	0	0	0	0	0	7,000
16	MM15001	Replace 5 Agency Vehicles	Replace 5 Agency vehicles: 3 Sedans, 1 Passenger Van, and 1 Pickup Truck.	EQ	GG	130,000	0	0	0	0	0	0	0	0	0	130,000
17	EC15001	Procure & Implement a Web-based GIS Application	Procure & Implement a Web-based GIS Application that Integrates SAP & ArcGIS	EQ	GG	150,000	0	0	0	0	0	0	0	0	0	150,000

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

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

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

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 use 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.

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	2	2	3	2
Plumbing	3	3	3	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

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. Engineering is currently evaluating the extent of the settling and will develop a project to address its impacts.

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. Engineering is working on a project to 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.

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
HVAC	2003	
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	

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

End of System Summary

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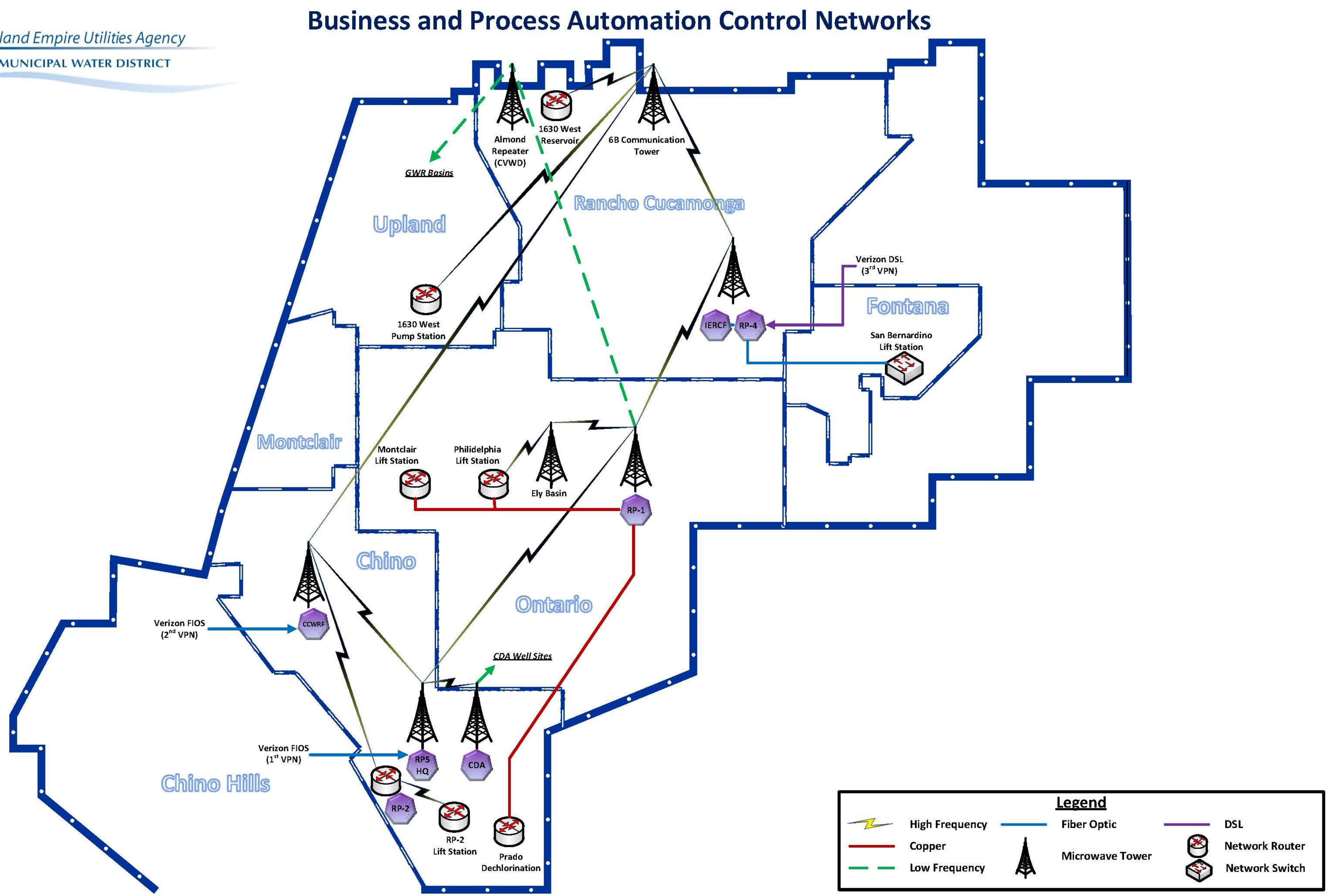

Figure 7-12: Business (BIZ) & Process Automation Control (PAC) Networks – Schematic

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Table 7-13: Business Network and Process Automation Control Network – Project Summary

#	Project Number[1]	Project Name	Project Description	Project Type[2]	Fund[3]	Fiscal Year Budget (Dollars)										
						2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	Ten-Year Total
1	IS14002	Records Mgmt Scanner Replacement	Replace failed scanner in Records Mgmt	EQ	GG	7,000	0	0	0	0	0	0	0	0	0	7,000
2	IS15008	Telephone System Upgrade	Workstation Replacement for the PAC Network	EQ	GG	46,000	0	0	0	0	0	0	0	0	0	46,000
3	IS13030	Server Replacement - Business Network	Server Replacement - Business Network	RP	GG	102,000	0	0	0	0	0	0	0	0	0	102,000
4	IS15010	PAC- Veeam Virtual Machine Backup/Recovery Software - GG	PAC- Veeam Virtual Machine Backup/Recovery Software - GG	OM	GG	17,000	0	0	0	0	0	0	0	0	0	17,000
5	IS15012	Business Network IT Improvements	Annual business network improvements (PLACEHOLDER)	RP	GG	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	2,000,000
6	EN13042	Philadelphia Pump Station Communication System	Installation of a monopole, radios, microwave dishes, communications panel and other equipment to allow the station to effectively communicate with the rest of the IEUA network.	CC	NC	150,000	15,000	0	0	0	0	0	0	0	0	165,000
7	IS15013	Philly LS Licensed Radio Upgrade	Replace 5.4 ghz with licensed 18 ghz radio	OM	RO	10,000	0	0	0	0	0	0	0	0	0	10,000
8	EN13043	Montclair Lift Station Communication System	Installation of a monopole, radios, microwave dishes, communications panel and other equipment to allow the station to effectively communicate with the rest of the IEUA network.	CC	RC	165,000	0	0	0	0	0	0	0	0	0	165,000
9	EN13016	SCADA Enterprise System	SCADA Enterprise System. Replacing the DCS.	CC	RO	1,000,000	2,625,000	3,000,000	3,000,000	0	0	0	0	0	0	9,625,000
10	EN13040	Prado Dechlor Communication System	Installation of a monopole, radios, microwave dishes, communications panel and other equipment to allow the station to effectively communicate with the rest of the IEUA network.	CC	WC	162,000	0	0	0	0	0	0	0	0	0	162,000
11	IS15014	RP-4 Foundation Field Bus Link Device	Replace existing FFLD with current equipment replacement from Rockwell	RP	RO	42,000	0	0	0	0	0	0	0	0	0	42,000
12	IS15015	PAC- L55 Processor Replacement / Redundancy Modules	Replace ethernet (EN2T) North/South (2 year project)	RP	RO	45,000	45,000	0	0	0	0	0	0	0	0	90,000
13	IS15016	RP-4 ControlNet Replacement	Replace ControlNet with Ethernet	RP	RO	112,000	0	0	0	0	0	0	0	0	0	112,000

#	Project Number[1]	Project Name	Project Description	Project Type[2]	Fund[3]	Fiscal Year Budget (Dollars)										
						2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	Ten-Year Total
14	IS15017	Replace Remote I/O Scanners at RP-4 - MCC1, RTU1, and RTU2	Replace remote I/O scanners with Ethernet	RP	RO	26,000	0	0	0	0	0	0	0	0	0	26,000
15	IS15018	Server Replacement - PAC Network	Server Replacement - Process Automation and Controls Network	RP	RO	10,000	0	0	0	0	0	0	0	0	0	10,000
16	IS15019	PAC- Veeam Virtual Machine Backup/Recovery Software - RO	PAC- Veeam Virtual Machine Backup/Recovery Software - RO	OM	RO	17,000	0	0	0	0	0	0	0	0	0	17,000
17	IS15020	Process Automation Controls IT Improvements	Annual PAC network improvements. (PLACEHOLDER)	RP	RO	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	3,000,000
18	IS15005	New GIS Plotter	Replace existing GIS plotter with a new 36-inch plotter with manufacturer's extended warranty.	EQ	GG	0	1,200	1,200	1,200	1,200	0	0	0	0	0	4,800
19	IS15006	SAP Server Hardware and Operation System Upgrade	Secure new server and necessary software licenses. ISS to integrate the new server to the existing virtualized server environment.	EQ	GG	0	0	0	0	0	0	0	0	0	0	0
20	IS14025	Finance Process Analysis & Roadmap	Finance Process Analysis & Roadmap	EQ	GG	48,000	0	0	0	0	0	0	0	0	0	48,000
21	IS15001	HCM Phase 2 HR Process & Automation & ESS/MSS Enhancements	HCM Phase 2 HR Process & Automation & ESS/MSS Enhancements	EQ	GG	0	191,000	0	0	0	0	0	0	0	0	191,000
22	IS15002	Document Management System - analysis & Roadmap	Document Management System - analysis & Roadmap	EQ	GG	48,000	0	0	0	0	0	0	0	0	0	48,000
23	IS15003	Document Management System - Implementation	Document Management System - Implementation	EQ	GG	250,000	100,000	0	0	0	0	0	0	0	0	350,000
24	IS15004	Executive Dashboard	Executive Dashboard	EQ	GG	100,000	0	0	0	0	0	0	0	0	0	100,000
25	IS16001	HCM Phase 2 Position Budgeting & Control	HCM Phase 2 Position Budgeting & Control	EQ	GG	0	0	206,000	0	0	0	0	0	0	0	206,000
26	IS16002	Grants Process Analysis & Roadmap	Grants Process Analysis & Roadmap	EQ	GG	0	36,000	0	0	0	0	0	0	0	0	36,000

#	Project Number[1]	Project Name	Project Description	Project Type[2]	Fund[3]	Fiscal Year Budget (Dollars)										
						2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	Ten-Year Total
27	IS16003	SAP Archiving	SAP Archiving	EQ	GG	0	0	0	50,000	0	0	0	0	0	0	50,00
28	FA15001	Purchase of two color scanners	Purchase of two color scanners, one to replace the loaner from Accounting & Fiscal Mgmt. that went to the front desk receptionist and one for Financial Planning	EQ	GG	8,300	0	0	0	0	0	0	0	0	0	8,300
29	IS12010	Payroll Replacement Project	Payroll Replacement Project	EQ	GG	53,600	0	0	0	0	0	0	0	0	0	53,600

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

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

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

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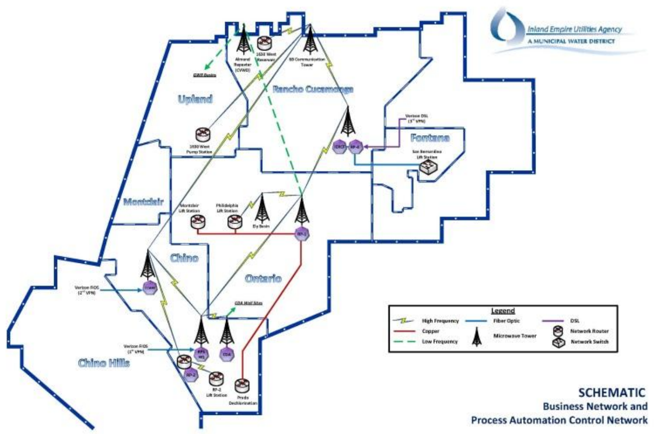
Asset Management System Summary – BIZ/PAC

Business & Process Automation Control 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.

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
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	
PAC – Productivity Tools		
Tablet	25 units	
Workstation	50 units	
PAC – Fixed Assets		
Microwave		
IEUA	5 units	
CVWD	1 unit	
DCS System	4 units	
SCADA System	4 units	
Server		
HyperV	3 units	
Server	49 units	
VMware	15 units	
UPS	88 units	
Network Switch	120 units	
PLC	250 units	
OIT	140 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
PAC – Productivity Tools	3	3	3	3
PAC – Fixed Assets	4	4	3	4

* Ratings as defined in Appendix A

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.

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 can be found in the Project Summary Table. There are no issues requiring special attention.

BIZ – Fixed Assets
Maintenance projects related to equipment replacement based on the product's lifecycle can be found in the Project Summary Table. There are no issues requiring special attention.

PAC – Productivity Tools
Maintenance projects related to equipment replacement based on the product's lifecycle can be found in the Project Summary Table. There are no issues requiring special attention.

PAC – Fixed Assets
Maintenance projects related to equipment replacement based on the product's lifecycle can be found in the Project Summary Table. There are no issues requiring special attention.

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
BIZ – Productivity Tools		
BIZ – Fixed Assets		
PAC – Microwave Towers		
PAC – Fixed Assets		

Table 4 Potential Projects

System	Project Name	Project Description
NA	NA	NA

End of System Summary

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Appendix A: Asset Ratings

Definitions of the ratings for each of the Failure Modes

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Table A-1 Condition Rating

Rating	Description
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	Description
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	Description
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.

Appendix B: Electrical Single Line Diagrams

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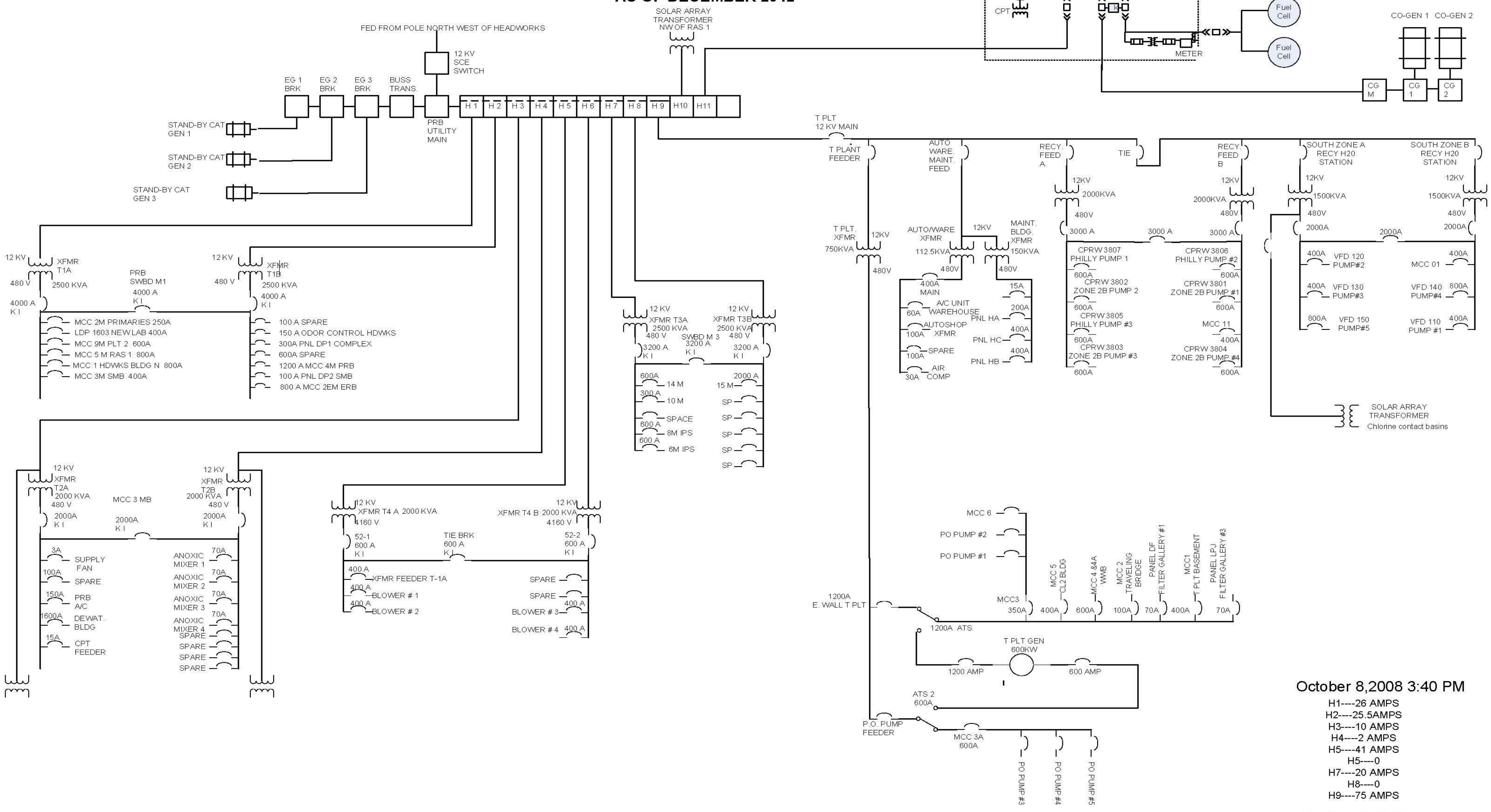
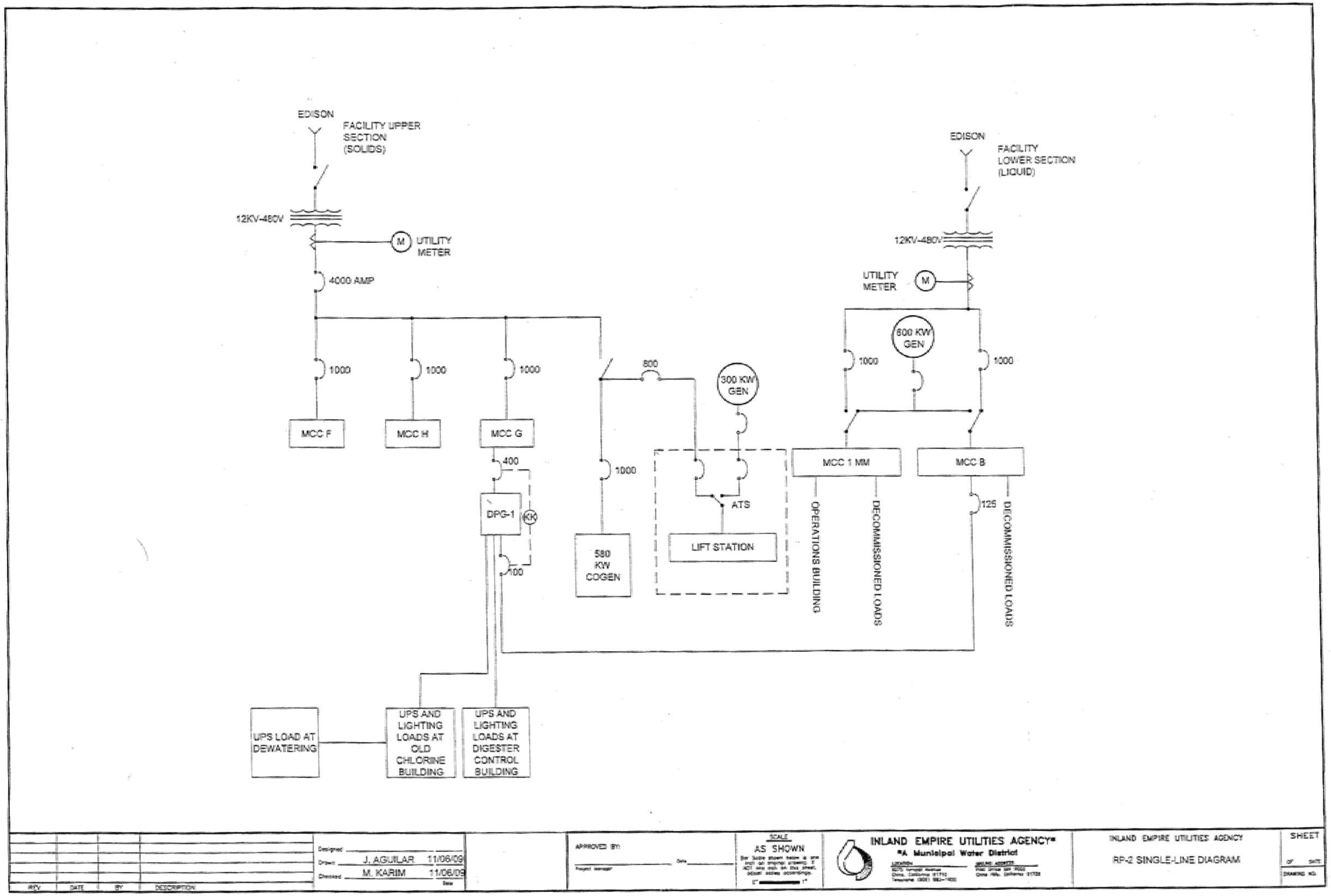
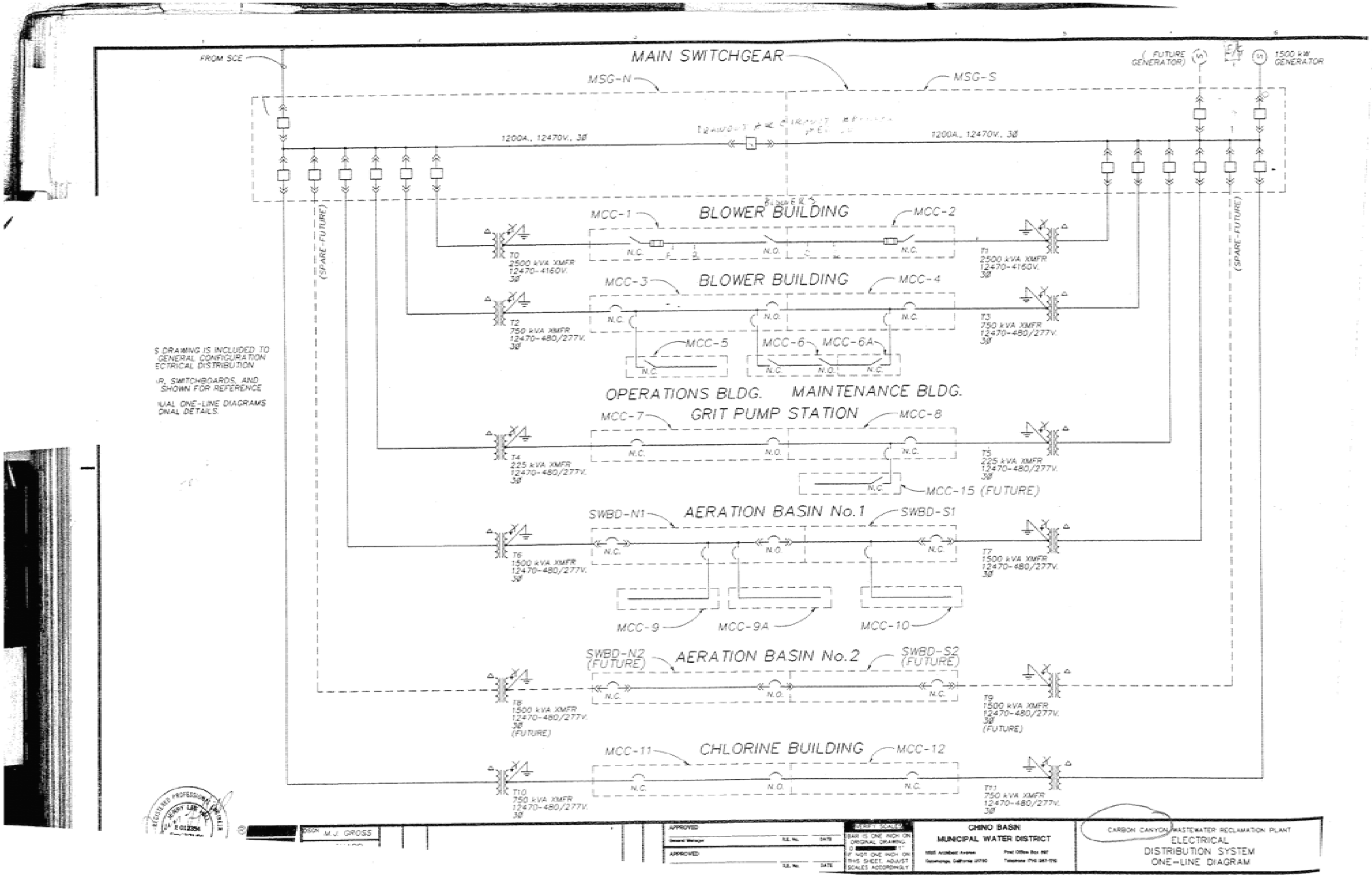
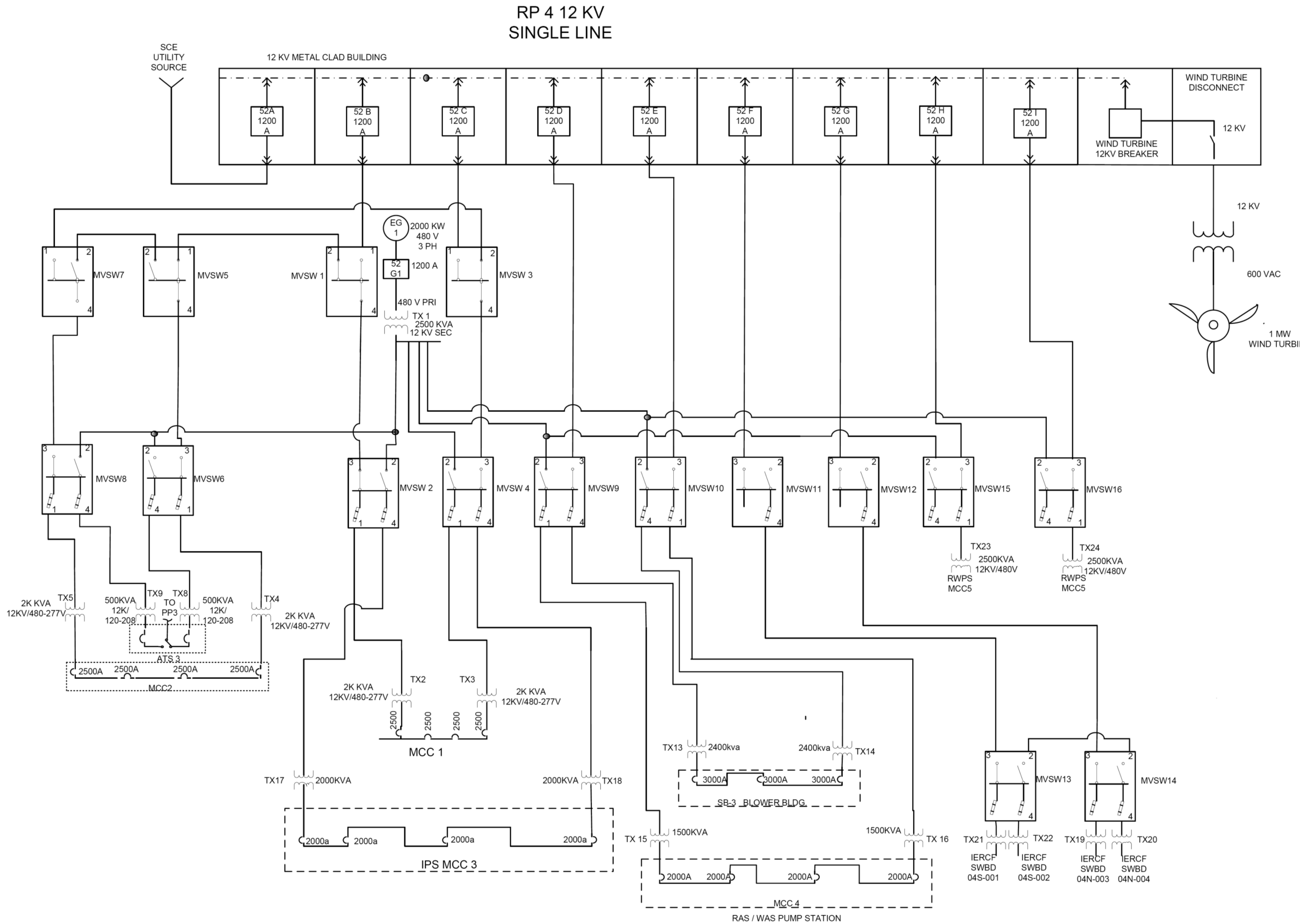
RP 1 PRIMARY FEED LAYOUT AS OF DECEMBER 2012

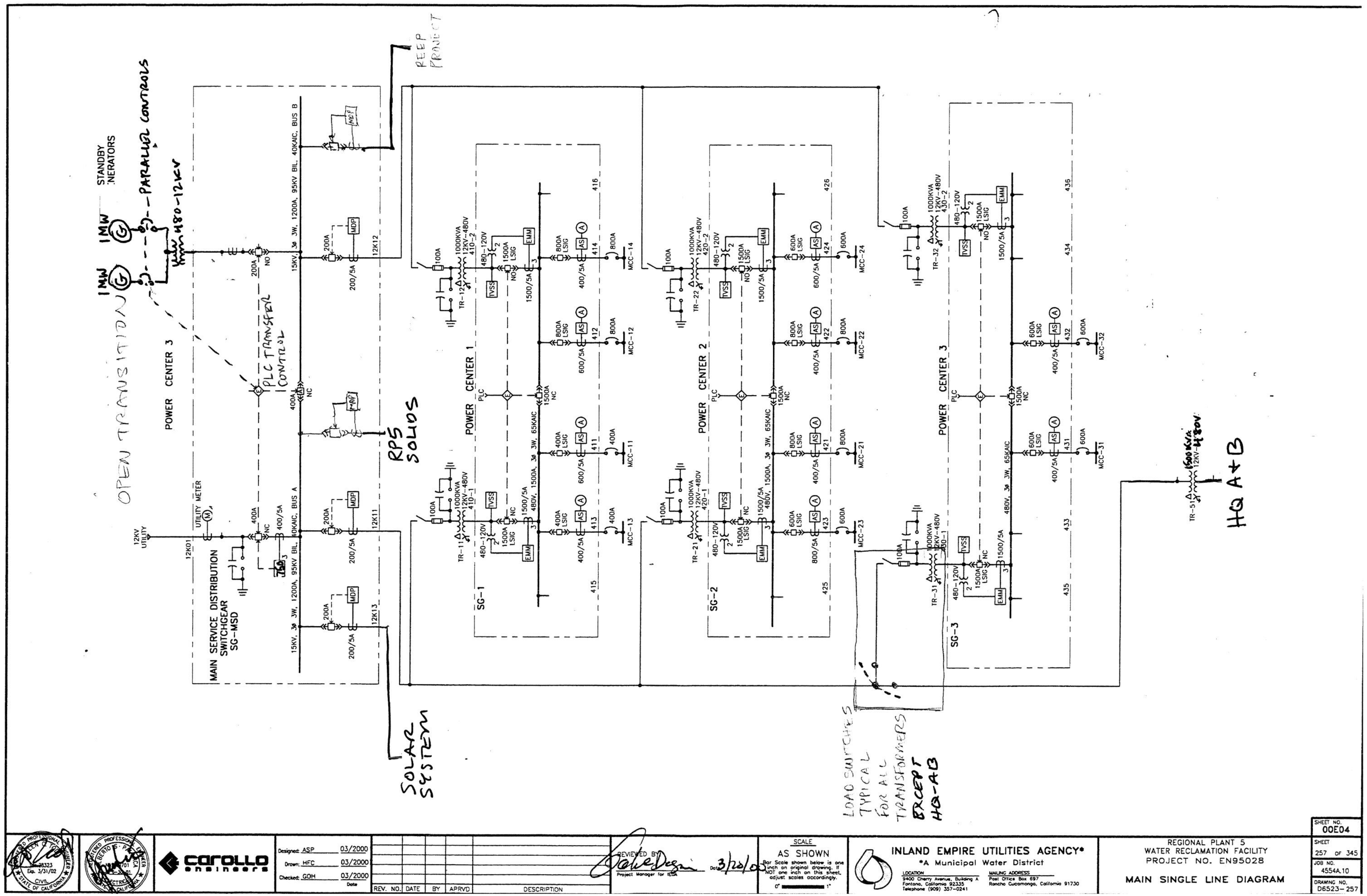


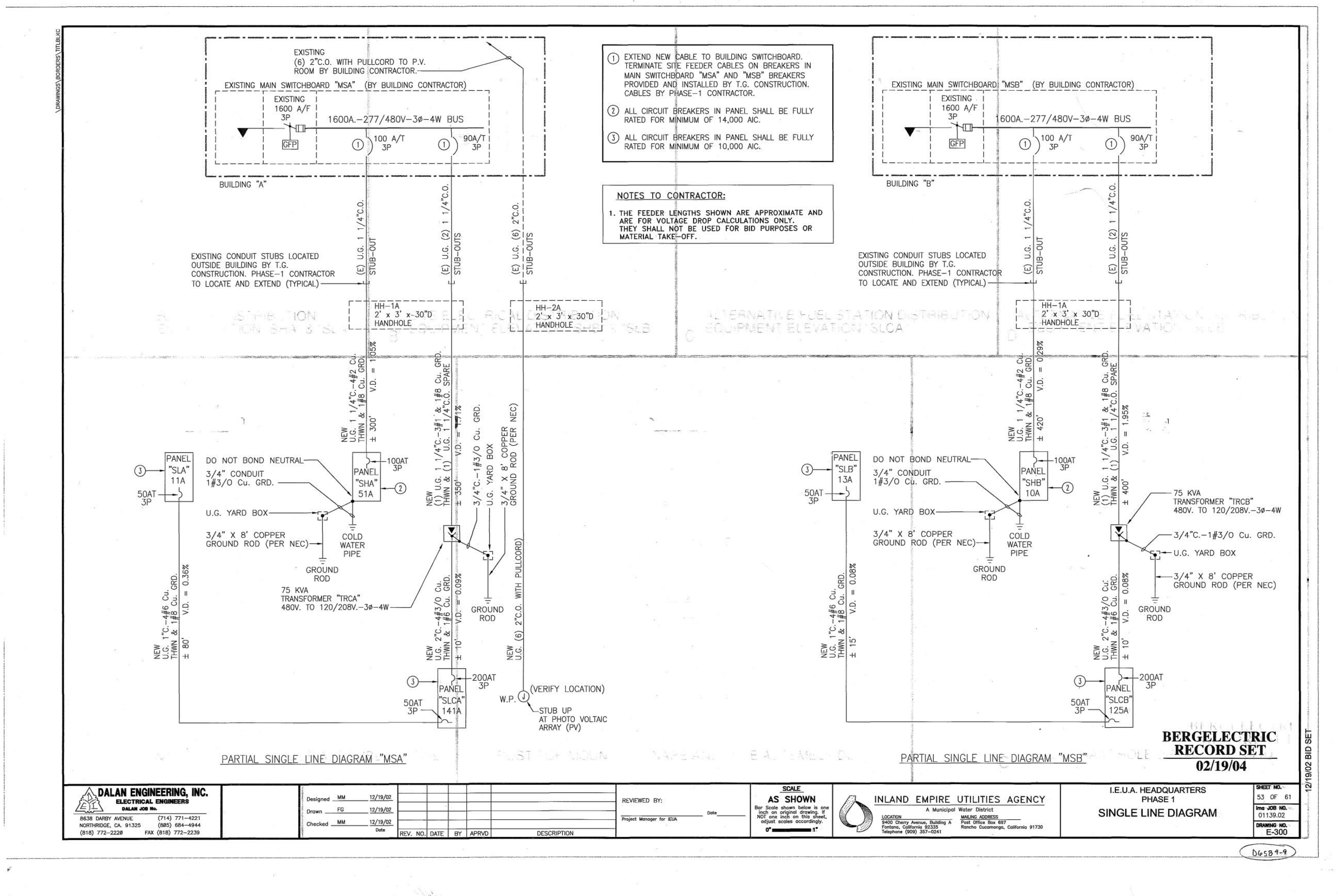

EDISON
FACILITY UPPER SECTION (SOLIDS)
12KV-480V
UTILITY METER
4000 AMP
1000
1000
1000
800
300 KW GEN
MCC F
MCC H
MCC G
400
DPG-1
KK
100
1000
580 KW COGEN
ATS
LIFT STATION
EDISON
FACILITY LOWER SECTION (LIQUID)
12KV-480V
UTILITY METER
600 KW GEN
1000
1000
MCC 1 MM
MCC B
125
OPERATIONS BUILDING
DECOMMISSIONED LOADS
DECOMMISSIONED LOADS
UPS LOAD AT DEWATERING
UPS AND LIGHTING LOADS AT OLD CHLORINE BUILDING
UPS AND LIGHTING LOADS AT DIGESTER CONTROL BUILDING
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
FROM SCE
MSG-N
MSG-S
(FUTURE GENERATOR)
1500 kW GENERATOR
1200A., 12470V., 3Ø
1200A., 12470V., 3Ø
MCC-1
BLOWER BUILDING
MCC-2
T0
2500 kVA XMFR
12470-4160V.
3Ø
T1
2500 kVA XMFR
12470-4160V.
3Ø
(SPARE-FUTURE)
MCC-3
BLOWER BUILDING
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.
MCC-7
GRIT PUMP STATION
MCC-8
T4
225 kVA XMFR
12470-480/277V.
3Ø
T5
225 kVA XMFR
12470-480/277V.
3Ø
MCC-15 (FUTURE)
SWBD-N1
AERATION BASIN No.1
SWBD-S1
T6
1500 kVA XMFR
12470-480/277V.
3Ø
T7
1500 kVA XMFR
12470-480/277V.
3Ø
MCC-9
MCC-9A
MCC-10
SWBD-N2 (FUTURE)
AERATION BASIN No.2
SWBD-S2 (FUTURE)
T8
1500 kVA XMFR
12470-480/277V.
3Ø
(FUTURE)
T9
1500 kVA XMFR
12470-480/277V.
3Ø
(FUTURE)
MCC-11
CHLORINE BUILDING
MCC-12
T10
750 kVA XMFR
12470-480/277V.
3Ø
T11
750 kVA XMFR
12470-480/277V.
3Ø
N.C.
N.O.
M.J. GROSS
APPROVED
CHINO BASIN
MUNICIPAL WATER DISTRICT
CARBON CANYON WASTEWATER RECLAMATION PLANT
ELECTRICAL
DISTRIBUTION SYSTEM
ONE-LINE DIAGRAM

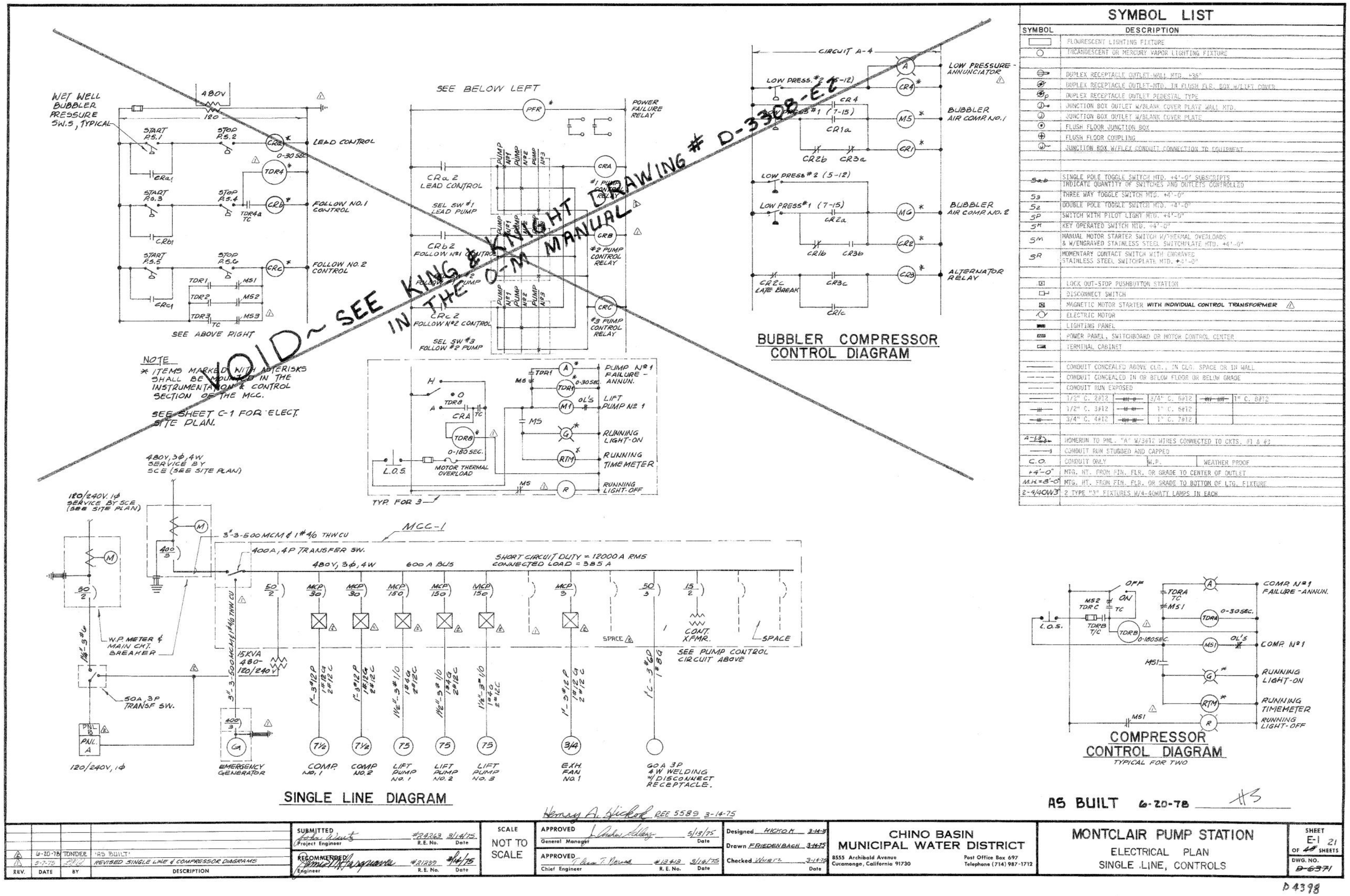


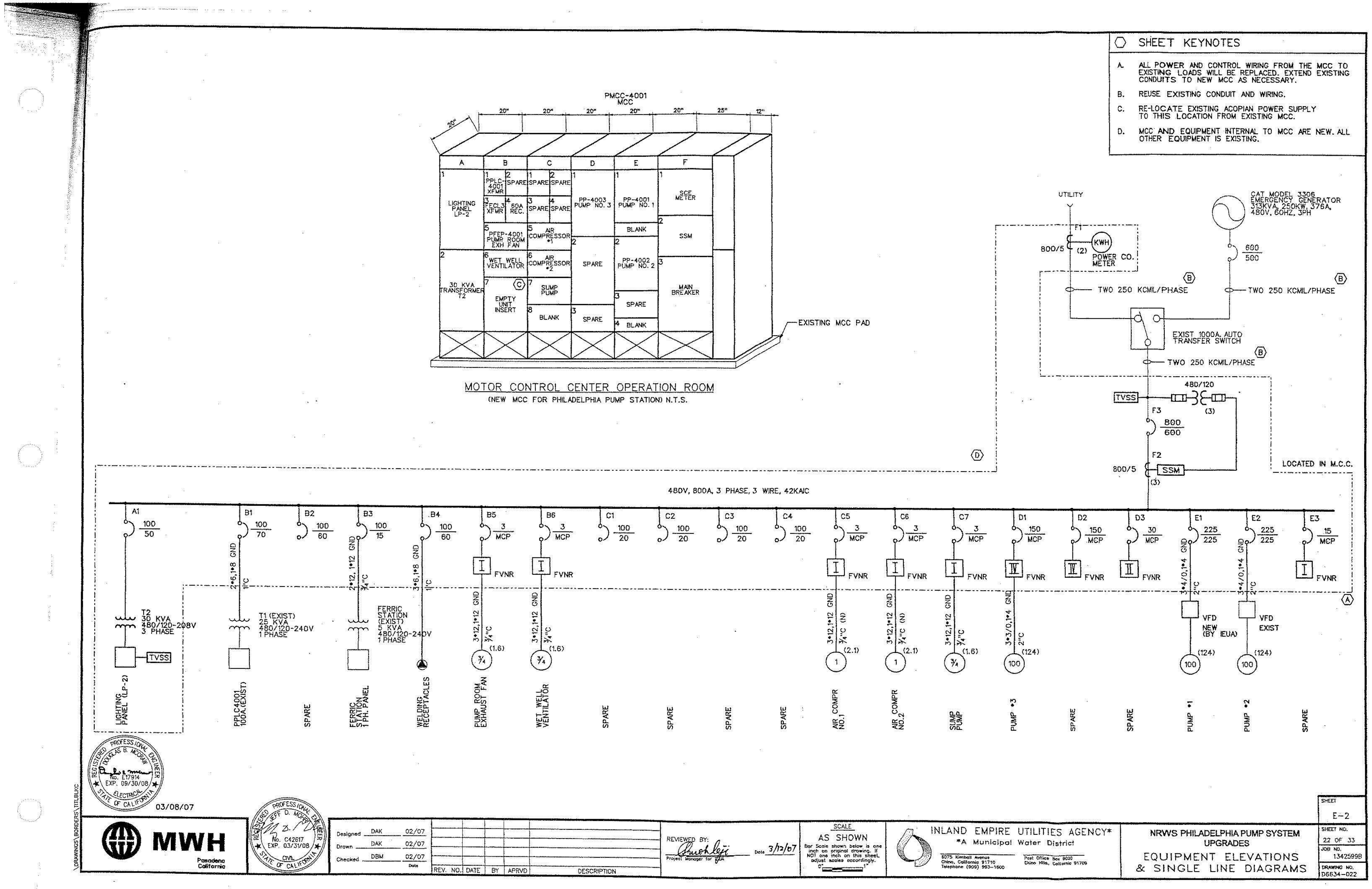
RP 4 12 KV
SINGLE LINE
SCE UTILITY SOURCE
12 KV METAL CLAD BUILDING
WIND TURBINE DISCONNECT
WIND TURBINE 12KV BREAKER
12 KV
600 VAC
1 MW WIND TURBINE
EG 1 2000 KW 480 V 3 PH
52 G1 1200 A
480 V PRI
TX 1 2500 KVA 12 KV SEC
MVSW7
MVSW5
MVSW 1
MVSW 3
MVSW8
MVSW6
MVSW 2
MVSW 4
MVSW9
MVSW10
MVSW11
MVSW12
MVSW15
MVSW16
MVSW13
MVSW14
TX23 2500KVA 12KV/480V RWPS MCC5
TX24 2500KVA 12KV/480V RWPS MCC5
ATS 3
MCC2
MCC 1
IPS MCC 3
SB-3 BLOWER BLDG
MCC 4
RAS / WAS PUMP STATION
IERCF SWBD 04S-001
IERCF SWBD 04S-002
IERCF SWBD 04N-003
IERCF SWBD 04N-004


INLAND EMPIRE UTILITIES AGENCY*
*A Municipal Water District
REGIONAL PLANT 5
WATER RECLAMATION FACILITY
PROJECT NO. EN95028
MAIN SINGLE LINE DIAGRAM
AS SHOWN
SHEET NO. 00E04
257 OF 345
4554A.10
D6523-257
carollo engineers
POWER CENTER 1
POWER CENTER 2
POWER CENTER 3
MAIN SERVICE DISTRIBUTION SWITCHGEAR SG-MSD
12KV UTILITY
SOLAR SYSTEM
RPS SOLIDS
HQ A+B
STANDBY GENERATORS
PARALLEL CONTROLS
OPEN TRANSITION
PLC TRANSFER CONTROL
REEP PROJECT
LOAD SWITCHES TYPICAL FOR ALL TRANSFORMERS EXCEPT HQ-AB

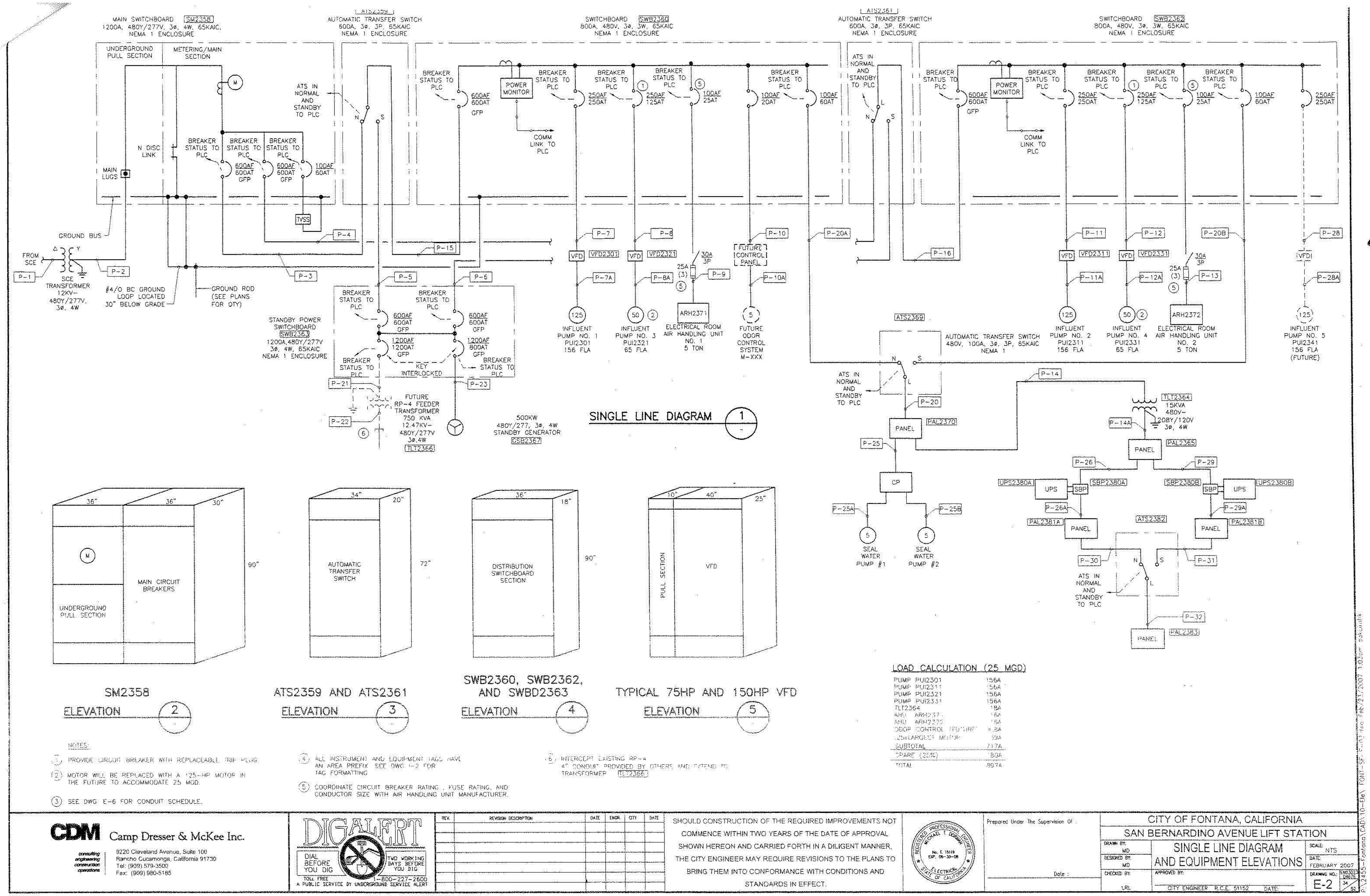


EXISTING (6) 2"C.O. WITH PULLCORD TO P.V. ROOM BY BUILDING CONTRACTOR.
EXISTING MAIN SWITCHBOARD "MSA" (BY BUILDING CONTRACTOR)
EXISTING 1600 A/F 3P
GFP
1600A.-277/480V-3Ø-4W BUS
100 A/T 3P
90A/T 3P
BUILDING "A"
1 EXTEND NEW CABLE TO BUILDING SWITCHBOARD. TERMINATE SITE FEEDER CABLES ON BREAKERS IN MAIN 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)
EXISTING 1600 A/F 3P
1600A.-277/480V-3Ø-4W BUS
BUILDING "B"
(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
EXISTING CONDUIT STUBS LOCATED OUTSIDE BUILDING BY T.G. CONSTRUCTION. PHASE-1 CONTRACTOR TO LOCATE AND EXTEND (TYPICAL)
HH-1A 2' x 3' x 30"D HANDHOLE
HH-2A 2' x 3' x 30"D HANDHOLE
PANEL "SLA" 11A
50AT 3P
DO NOT BOND NEUTRAL
3/4" CONDUIT 1#3/0 Cu. GRD.
PANEL "SHA" 51A
100AT 3P
U.G. YARD BOX
3/4" X 8' COPPER GROUND ROD (PER NEC)
COLD WATER PIPE
GROUND ROD
75 KVA TRANSFORMER "TRCA" 480V. TO 120/208V.-3Ø-4W
PANEL "SLCA" 141A
200AT 3P
W.P.
(VERIFY LOCATION)
STUB UP AT PHOTO VOLTAIC ARRAY (PV)
PARTIAL SINGLE LINE DIAGRAM "MSA"
PANEL "SLB" 13A
PANEL "SHB" 10A
75 KVA TRANSFORMER "TRCB" 480V. TO 120/208V.-3Ø-4W
3/4"C.-1#3/0 Cu. GRD.
PANEL "SLCB" 125A
PARTIAL SINGLE LINE DIAGRAM "MSB"
BERGELECTRIC RECORD SET 02/19/04
DALAN ENGINEERING, INC. ELECTRICAL ENGINEERS
8638 DARBY AVENUE NORTHRIDGE, CA. 91325
(714) 771-4221 (805) 684-4944 (818) 772-2228 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:
Project Manager for IEUA
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
12/19/02 BID SET


VOID ~ SEE KING & KNIGHT DRAWING # D-3308-E1
IN THE O-M MANUAL
SYMBOL LIST
SYMBOL
DESCRIPTION
WET WELL BUBBLER PRESSURE SW.S, TYPICAL
LEAD CONTROL
FOLLOW NO. 1 CONTROL
FOLLOW NO. 2 CONTROL
SEE ABOVE RIGHT
SEE BELOW LEFT
POWER FAILURE RELAY
#1 PUMP CONTROL RELAY
#2 PUMP CONTROL RELAY
#3 PUMP CONTROL RELAY
NOTE
* ITEMS MARKED WITH ASTERISKS SHALL BE MOUNTED IN THE INSTRUMENTATION & CONTROL SECTION OF THE MCC.
SEE SHEET C-1 FOR ELECT. SITE PLAN.
PUMP Nº 1 FAILURE - ANNUN.
LIFT PUMP Nº 1
RUNNING LIGHT-ON
RUNNING TIMEMETER
RUNNING LIGHT-OFF
MOTOR THERMAL OVERLOAD
TYP. FOR 3
LOW PRESSURE - ANNUNCIATOR
BUBBLER AIR COMP. NO. 1
BUBBLER AIR COMP. NO. 2
ALTERNATOR RELAY
BUBBLER COMPRESSOR CONTROL DIAGRAM
480V, 3Φ, 4W SERVICE BY SCE (SEE SITE PLAN)
120/240V, 1Φ SERVICE BY SCE (SEE SITE PLAN)
MCC-1
400A, 4P TRANSFER SW.
480V, 3Φ, 4W
600 A BUS
SHORT CIRCUIT DUTY = 12000 A RMS
CONNECTED LOAD = 385 A
W.P. METER & MAIN CKT. BREAKER
50A, 3P TRANSF. SW.
15KVA 480-120/240V
EMERGENCY GENERATOR
120/240V, 1Φ
COMP. NO. 1
COMP. NO. 2
LIFT PUMP NO. 1
LIFT PUMP NO. 2
LIFT PUMP NO. 3
EXH. FAN NO. 1
60A 3P 4W WELDING W/ DISCONNECT RECEPTACLE.
SEE PUMP CONTROL CIRCUIT ABOVE
SPACE
SINGLE LINE DIAGRAM
COMP. Nº 1 FAILURE - ANNUN.
COMP. Nº 1
RUNNING LIGHT-ON
RUNNING TIMEMETER
RUNNING LIGHT-OFF
COMPRESSOR CONTROL DIAGRAM
TYPICAL FOR TWO
AS BUILT 6-20-78
REVISED SINGLE LINE & COMPRESSOR DIAGRAMS
AS BUILT
NOT TO SCALE
CHINO BASIN MUNICIPAL WATER DISTRICT
MONTCLAIR PUMP STATION
ELECTRICAL PLAN
SINGLE LINE, CONTROLS
SHEET E-1
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
EXISTING MCC PAD
MOTOR CONTROL CENTER OPERATION ROOM
(NEW MCC FOR PHILADELPHIA PUMP STATION) N.T.S.
UTILITY
CAT MODEL 3306 EMERGENCY GENERATOR 313KVA, 250KW, 376A, 480V, 60HZ, 3PH
POWER CO. METER
TWO 250 KCMIL/PHASE
EXIST 1000A AUTO TRANSFER SWITCH
LOCATED IN M.C.C.
480V, 800A, 3 PHASE, 3 WIRE, 42KAIC
LIGHTING PANEL (LP-2)
PPLC4001 100A (EXIST)
SPARE
FERRIC STATION 1 PH. PANEL
WELDING RECEPTACLES
PUMP ROOM EXHAUST FAN
WET WELL VENTILATOR
AIR COMPR NO.1
AIR COMPR NO.2
SUMP PUMP
PUMP #3
PUMP #1
PUMP #2
03/08/07
MWH Pasadena California
REVIEWED BY: 3/12/07
SCALE AS SHOWN
INLAND EMPIRE UTILITIES AGENCY* *A Municipal Water District
NRWS PHILADELPHIA PUMP SYSTEM UPGRADES
EQUIPMENT ELEVATIONS & SINGLE LINE DIAGRAMS
SHEET E-2
SHEET NO. 22 OF 33
JOB NO. 1342599B
DRAWING NO. D6634-D22


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
SINGLE LINE DIAGRAM
500KW 480Y/277, 3ø, 4W STANDBY GENERATOR
STANDBY POWER SWITCHBOARD SWBD2363
INFLUENT PUMP NO. 1 PUI2301 156 FLA
INFLUENT PUMP NO. 3 PUI2321 65 FLA
INFLUENT PUMP NO. 2 PUI2311 156 FLA
INFLUENT PUMP NO. 4 PUI2331 65 FLA
INFLUENT PUMP NO. 5 PUI2341 156 FLA (FUTURE)
SEAL WATER PUMP #1
SEAL WATER PUMP #2
SM2358 ELEVATION
ATS2359 AND ATS2361 ELEVATION
SWB2360, SWB2362, AND SWBD2363 ELEVATION
TYPICAL 75HP AND 150HP VFD ELEVATION
LOAD CALCULATION (25 MGD)
NOTES:
PROVIDE CIRCUIT BREAKER WITH REPLACEABLE TRIP PLUG.
MOTOR WILL BE REPLACED WITH A 125-HP MOTOR IN THE FUTURE TO ACCOMMODATE 25 MGD.
SEE DWG E-6 FOR CONDUIT SCHEDULE.
ALL INSTRUMENT AND EQUIPMENT TAGS HAVE AN AREA PREFIX. SEE DWG I-2 FOR TAG FORMATTING.
COORDINATE CIRCUIT BREAKER RATING, FUSE RATING, AND CONDUCTOR SIZE WITH AIR HANDLING UNIT MANUFACTURER.
CDM Camp Dresser & McKee Inc.
9220 Cleveland Avenue, Suite 100
Rancho Cucamonga, California 91730
Tel: (909) 579-3500
Fax: (909) 980-5185
DIG ALERT
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

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Appendix C: Yard Piping

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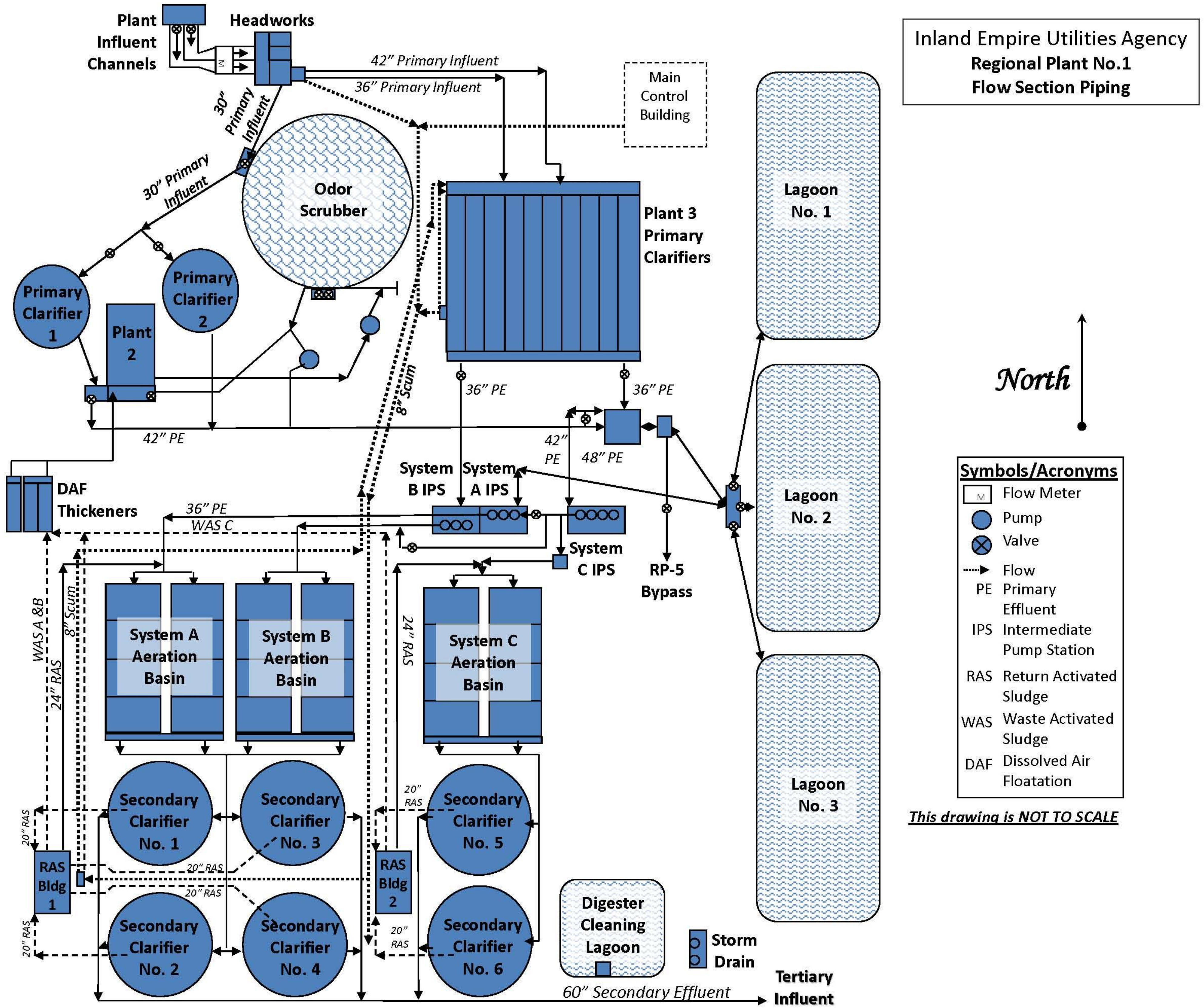
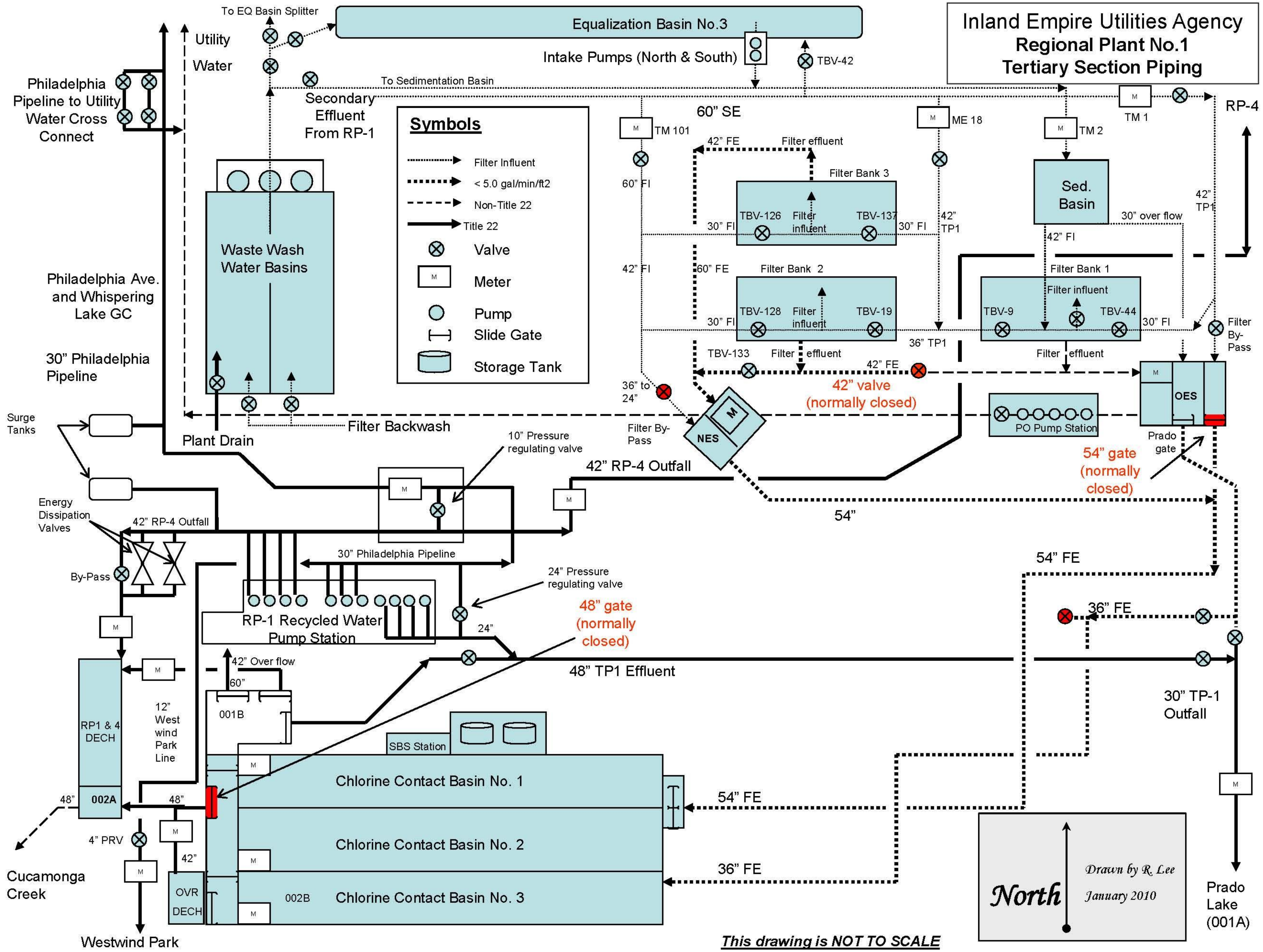
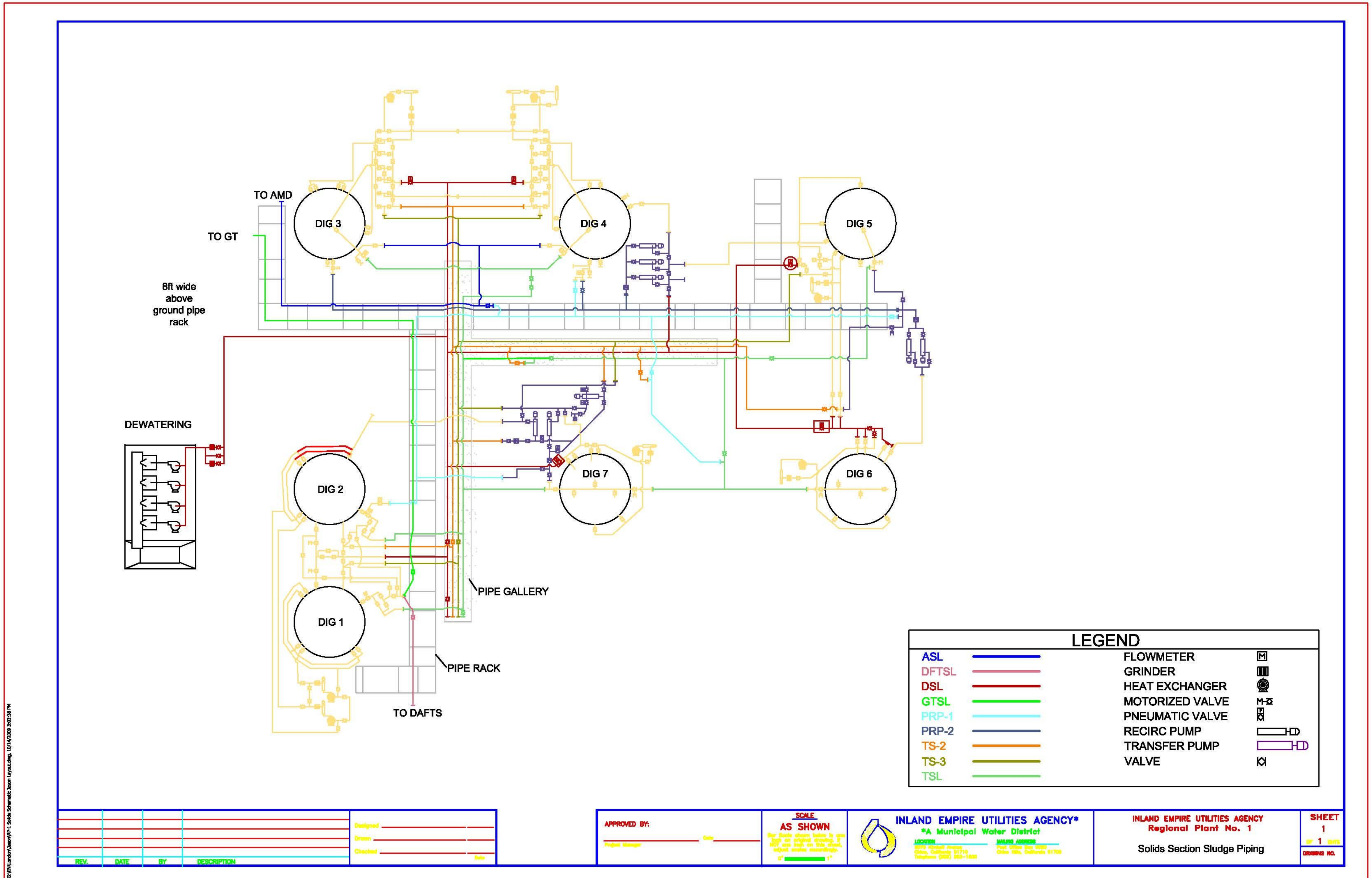

Inland Empire Utilities Agency
Regional Plant No.1
Flow Section Piping
Plant Influent Channels
Headworks
42" Primary Influent
36" Primary Influent
Main Control Building
30" Primary Influent
30" Primary Influent
Odor Scrubber
Plant 3 Primary Clarifiers
Primary Clarifier 1
Primary Clarifier 2
Plant 2
8" Scum
36" PE
36" PE
42" PE
42" PE
48" PE
DAF Thickeners
36" PE
WAS C
System B IPS
System A IPS
System C IPS
RP-5 Bypass
Lagoon No. 1
Lagoon No. 2
Lagoon No. 3
North
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. 3
Secondary Clarifier No. 5
Secondary Clarifier No. 2
Secondary Clarifier No. 4
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
To EQ Basin Splitter
Utility
Water
Intake Pumps (North & South)
TBV-42
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
42" FE
Filter effluent
Filter Bank 3
60" FI
Sed.
Basin
42" TP1
30" FI
TBV-126
Filter influent
TBV-137
30" over flow
42" FI
60" FE
Filter Bank 2
Filter Bank 1
TBV-128
TBV-19
TBV-9
TBV-44
36" TP1
Filter By-Pass
TBV-133
Filter effluent
42" FE
42" valve
(normally closed)
36" to 24"
NES
PO Pump Station
OES
Prado gate
54" gate
(normally closed)
10" Pressure regulating valve
42" RP-4 Outfall
54"
54" FE
Energy
Dissipation
Valves
By-Pass
30" Philadelphia Pipeline
24" Pressure regulating valve
48" gate
(normally closed)
36" FE
RP-1 Recycled Water
Pump Station
24"
42" Over flow
60"
48" TP1 Effluent
30" TP-1
Outfall
001B
RP1 & 4
DECH
12" West wind Park Line
SBS Station
Chlorine Contact Basin No. 1
Chlorine Contact Basin No. 2
Chlorine Contact Basin No. 3
002A
002B
48"
4" PRV
42"
OVR
DECH
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
DIG 3
DIG 4
DIG 5
8ft wide above ground pipe rack
DEWATERING
DIG 2
DIG 7
DIG 6
DIG 1
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.

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