Inland Empire Utilities Agency

Climate Change Action Plan

prepared by

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Table of Contents

Tables

Figures

1 Introduction

1.1 Background and Purpose

The Inland Empire Utilities Agency (IEUA) is a regional wastewater treatment agency, wholesale distributor of imported water, and sewage utility service provider located in western San Bernardino County. IEUA provides service to approximately 935,000 people over a 242 square mile area (IEUA 2022). The service area is located in southwestern San Bernardino County in the Santa Ana River Watershed, which encompasses the Chino Groundwater Basin (IEUA 2010). The IEUA service area and location of assets are shown in Figure 1.

IEUA is focused on providing three key services:

1) Treating wastewater and developing programs to reduce regional dependence on imported water;
2) Converting waste products and biosolids into compost; and
3) Generating electrical energy from renewable resources to offset IEUA facility energy use.

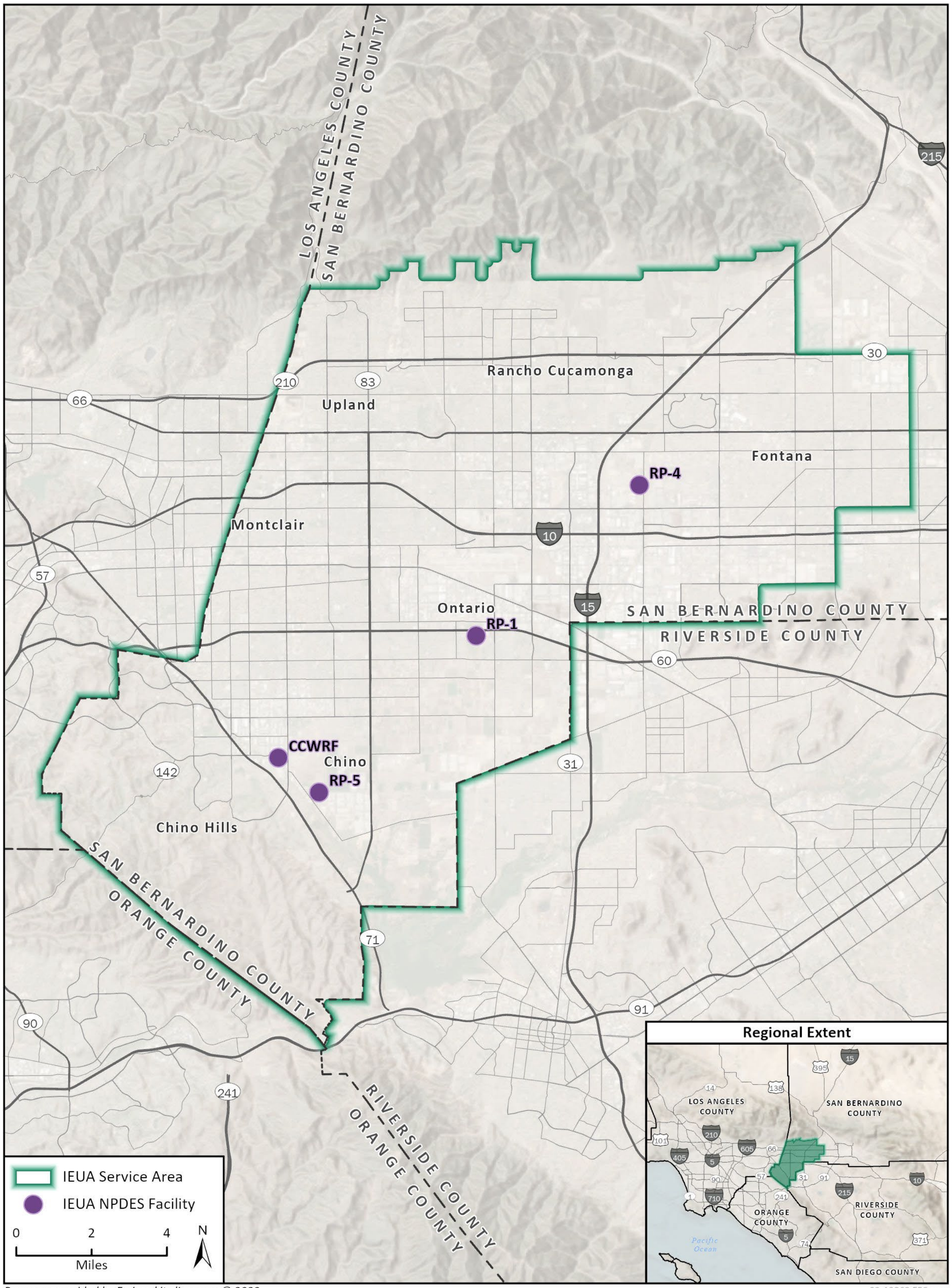
IEUA started selling recycled water in the 1970s to provide a low-cost alternative to potable water for large irrigation customers. Supported recycled water uses include agricultural, landscaping, golf courses, industrial cooling, parks, recreational lakes, groundwater recharge, and vegetated median strips. The Santa Ana River Watershed where the IEUA service area is located is experiencing fast-paced growth. Recycled water plays a critical role in maintaining economic growth while improving the region's resilience to drought. As urban potable water demand increases and long-term imported water supply declines, recycled water will play an increasingly important role in meeting water demand for irrigation (IEUA 2010, 2015b).

IEUA's wastewater treatment facilities discharge water into federally regulated receiving waters and use areas of the Chino Creek and Cucamonga Creek. Collectively, the wastewater treatment system takes in 50.8 million gallons per day (MGD) of wastewater for treatment (IEUA 2022). The Facilities covered under the Permit serve a population of 817,372 spanning multiple cities and agencies across the Facility Service Area in western San Bernardino, as described by the Permit.

Permission to discharge wastewater from IEUA's regional water recycling facilities is regulated by the United States Environmental Protection Agency under the Federal Clean Water Act and is delegated to the California Environmental Protection Agency for implementation by the State Water Resources Control Board (SWRCB) and the Santa Ana Regional Water Quality Control Board (RWQCB) under the National Pollutant Discharge Elimination System (NPDES) Program. RWQCB Order No. R8-2022-0041 NPDES No. CA8000409 includes Section VI.C.5 (Special Provision 5), which requires IEUA to submit a Climate Change Action Plan (CCAP) within 18 months of the effective date of the Order (August 1, 2022). This CCAP has been prepared to fulfill the requirements presented in Special Provision 5. The CCAP includes information on implementation of the IEUA's 2019 Climate Change Action Plan (2019 CCAP) and 2015 Energy Management Plan (EMP) and how climate change may alter the way IEUA Facilities are designed and operated. The CCAP also addresses potential climate impacts to effluent water quality, and mitigation sites approved by the RWQCB.

Throughout this CCAP, the collective facilities regulated by the NPDES permit are described as 'Facilities', while individual plants are referenced by name (ex. RP-1), or as 'Plant/Plant(s)'.

Figure 1 IEUA Service Area and Location of IEUA NPDES Facilities



Basemap provided by Esri and its licensors © 2023.
Additional data provided by IEUA, 2023.

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Fig 1 IEUA Service Area and Facilities

Source: Inland Empire Utilities Agency Facilities Master Plan (2016)

As stipulated by Special Provision 5, the CCAP addresses the following:

a. *Projected regional impacts on the Facilities and operations due to climate change if current trends continue.*
b. *Steps being taken or planned to address:*
    i. *Greenhouse gas emissions, directly and indirectly, attributable to the Facilities operations and effluent discharge process;*
    ii. *Flooding risks that may affect the operations including discharges at the Facility;*
    iii. *Volatile rain period impacts (both dry and wet weather);*
    iv. *Impacts on process design parameters due to changes caused by climate change;*
    v. *Impacts on the Facilities operations and effluent water quality; and*
    vi. *Impacts to the mitigation site(s) approved by the Santa Ana Water Board.*
c. *Potential need to adjust the conditions of this Order.*
d. *Financing needed to pay for planned actions;*
e. *Conformity with plans and requirements by other agencies, including but not limited to the California Air Resources Board, and the Air Pollution Control District.*
f. *Schedules to update the CCAP as more information on climate change and its effects become available.*
g. *Any other factors as appropriate*

1.2 Facility and Operations Overview

As defined by the NPDES Program, RWQCB Order No. R8-2022-0041 NPDES No. CA8000409 includes Section VI.C.5 (Special Provision 5), Facilities covered under this CCAP include IEUA Regional Water Recycling Plant Nos. 1, 4, 5, and the Carbon Canyon Recycling Facility.

Permitted Facilities receive domestic, commercial, and industrial wastewater generated within IEUA service areas for treatment. The wastewater treatment process at the Facilities goes through a five-step process: Preliminary Treatment, Primary Treatment, Secondary Treatment, Tertiary Treatment, and Solids Treatment. The treated water can then be discharged to outfalls or recycled for industrial uses, irrigation, and groundwater recharge.

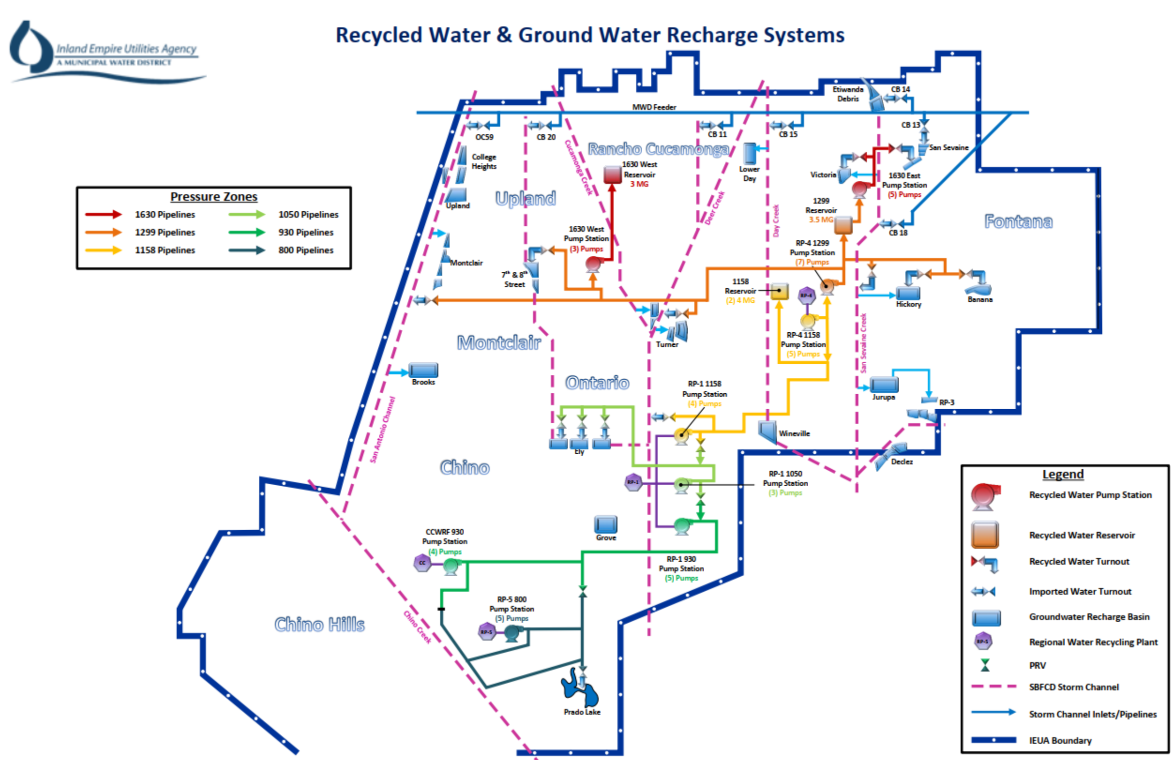
The Facilities have a combined design treatment capacity of 86.3 MGD*;* with variable inflow and effluent outflows as detailed by Facility in Table 1, and shown in a flow schematic in Figure 2.

Table 1 Facility Design Treatment Capacity & Annual Influent & Effluent Flows (2022)

Facility Name	Design Treatment Capacity (million gallons per day; MGD)	2022 Annual Average Influent Flow (million gallons per day; MGD)	2022 Annual Average Effluent Flow (million gallons per day; MGD)
RP-1	44	25.49	7.9
RP-4	14	9.2	0[2]
RP-5	15 & 1.3[1]	8.4	5.1
CCWRF	12	7.8	2.0

Source: National Pollutant Discharge Elimination System (NPDES) Program. RWQCB Order No. R8-2022-0041 NPDES No. CA8000409
Updated by Inland Empire Utilities Agency Regional Water Recycling Facilities 2022 Annual NPDES Report for 2022 value
1: 1.3 MGD flow from sludge treatment system at RP2; and a projected 22.5 MGD by 2024.
2: RP-4 flow typically goes to recycled water pumping. May not be the case during wet weather months.

Figure 2 IEUA Recycled Water & Ground Water Recharge Systems Schematic



Source: *IEUA 2023: Recycled Water & Ground Water Recharge Systems (AMD FPD Attachment)*

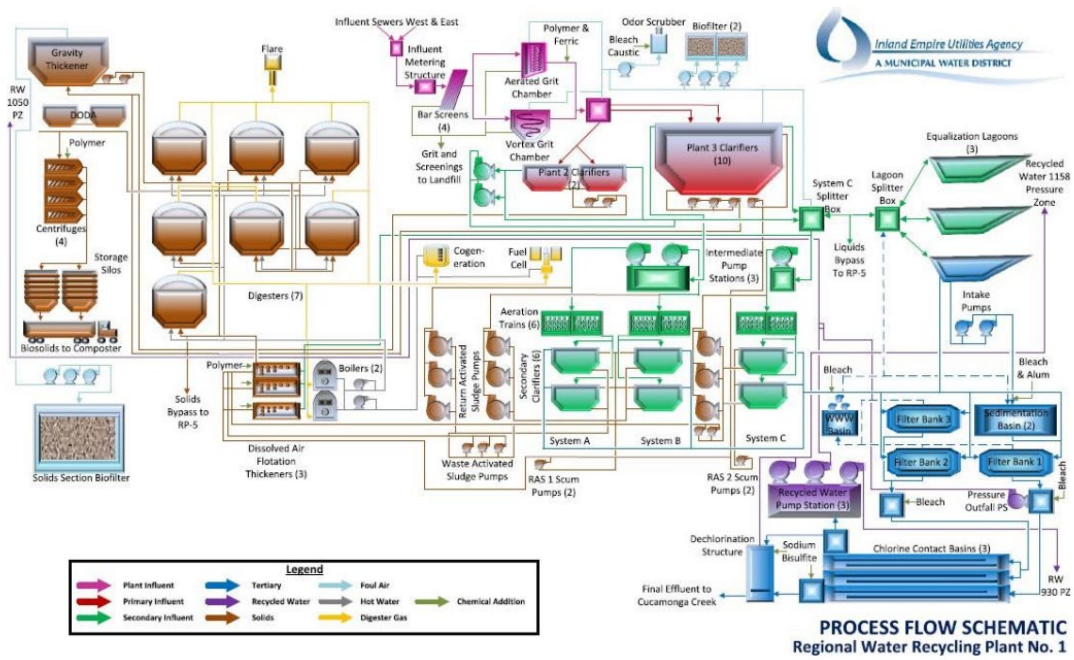
Regional Water Recycling Plant No. 1 (RP-1)

RP-1 serves Fontana, Montclair, Upland, Ontario, Cucamonga Valley Water District, and some unincorporated areas. RP-1 is located at 2662 East Walnut Street in Ontario. RP-1 and RP-4 (described below) collectively serve a population of 609,254 with produced recycled water.

RP-1 Inflows & Effluent Outflows

RP-1 intakes wastewater from influent sewers west and east. The volume of water passing through the intake is monitored through a flow meter (influent metering structure). After passing through preliminary, primary, secondary, and tertiary treatment described in Figure 3 the recycled water passes through as final effluent to Cucamonga Creek. Tertiary treated wastewater from RP-1 is also delivered through the regional recycled water system for recycled water use as landscape irrigation and for industrial purposes. The most recent documented maximum annual average flow for recycled water uses for RP-1 was 16.1 MGD in 2016. Recycled water from RP-1 is also used as groundwater recharge through surface application to areas overlying the Chino North Groundwater Management Zone, which is regulated under a separate order (Order R8-2007-0039). Solids treatment at RP-1 includes gravity thickener and dissolved air flotation thickeners, anaerobic digestion, digester gas utilization, and centrifuge dewatering. Centrifuge concentrate is pumped to the Non-Reclaimable Waste System (NRWS) line and is ultimately treated by the County Sanitation Districts of Los Angeles County.

Figure 3 Regional Water Recycling Plant No. 1 Process Flow Schematic



Source: NPDES Permit Attachment C

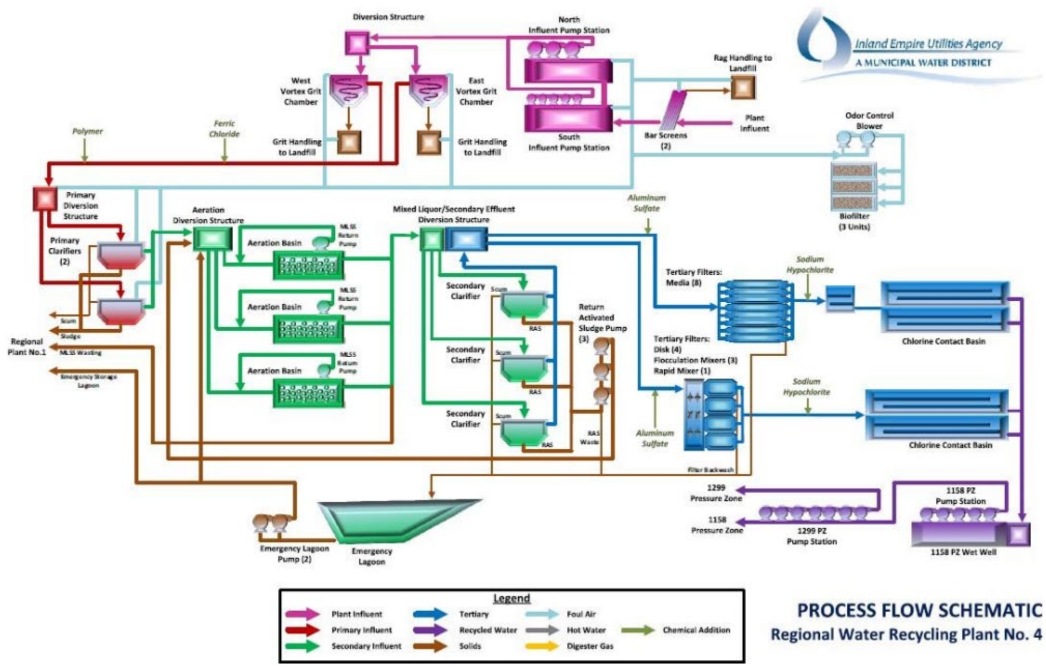
Regional Water Recycling Plant No. 4 (RP-4)

RP-4 serves the same cities and agencies as RP-1, as the two Plants are connected via the pressure zone 1158 pipeline. RP-4 is located at 12811 Sixth Street, Rancho Cucamonga.

RP-4 Inflows & Effluent Outflows

RP-4 intakes wastewater from plant influent, and processes it through a primary, secondary, and tertiary treatment system described in Figure 4 . Solids from RP-4 are then routed to RP-1 through the collection system as influent. Tertiary treated wastewater from RP-4 and RP-1 is then discharged as effluent to Reach 1 of Cucamonga Creek, and recycled water is applied to use areas overlying the Chino North Groundwater Management Zone, similar to RP-1.[1]

Figure 4 Regional Water Recycling Plant No. 4 Process Flow Schematic



Source: *NPDES Permit Attachment C*

Regional Water Recycling Plant No. 5 (RP-5)

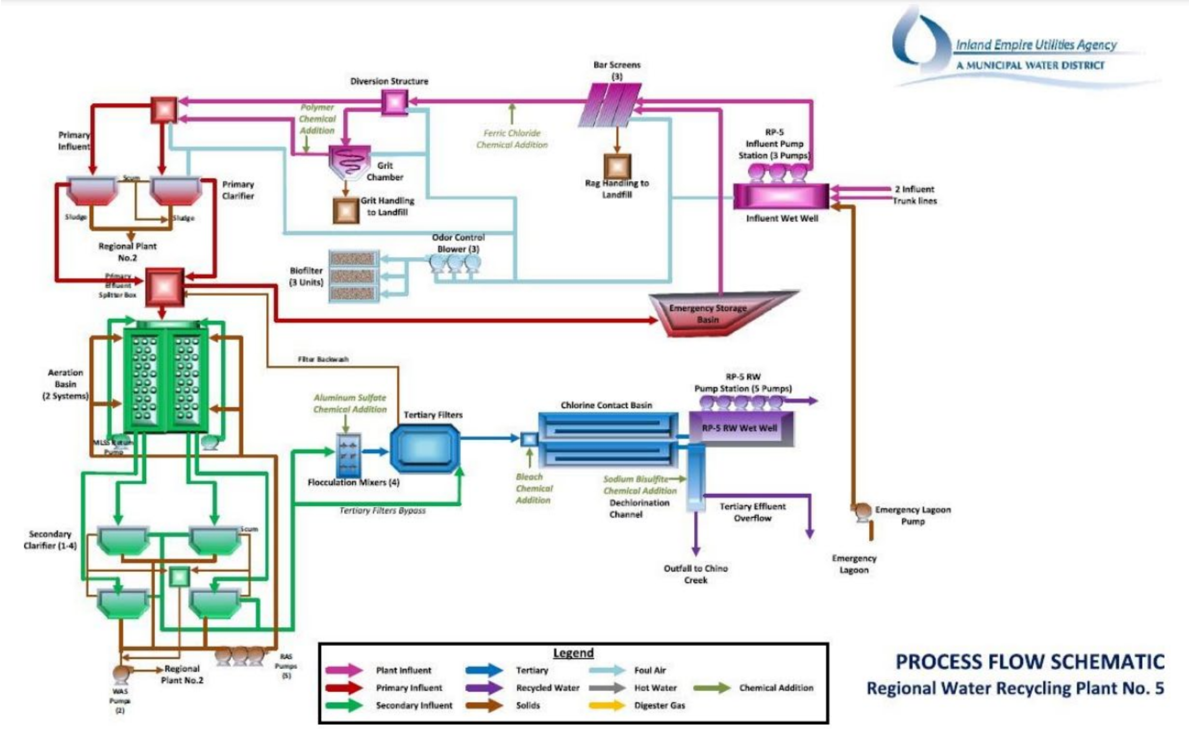
RP-5 directly serves Chino, Chino Hills, and Ontario. Montclair and Upland are served by RP-5 via the Carbon Canyon Water Recycling Facility (CCWRF). RP-5 is located at 6063 Kimball Avenue, Chino. RP-5 serves a population of 115,244 throughout the cities and agencies named above.

RP-5 Inflows & Outflows

RP-5 intakes wastewater from plant influent. After passing through preliminary, primary, secondary, and tertiary treatment, described in Figure 5, the recycled water passes through to the RP-5 RW Wet Well with tertiary effluent overflow and an outfall to Chino Creek. Figure 6 describes upgrades to RP-5, which are expected to be completed by 2024. Recycled water is used for irrigation, landscape and industrial use. Tertiary treated wastewater is discharged into Reach 1B of Chino Creek.

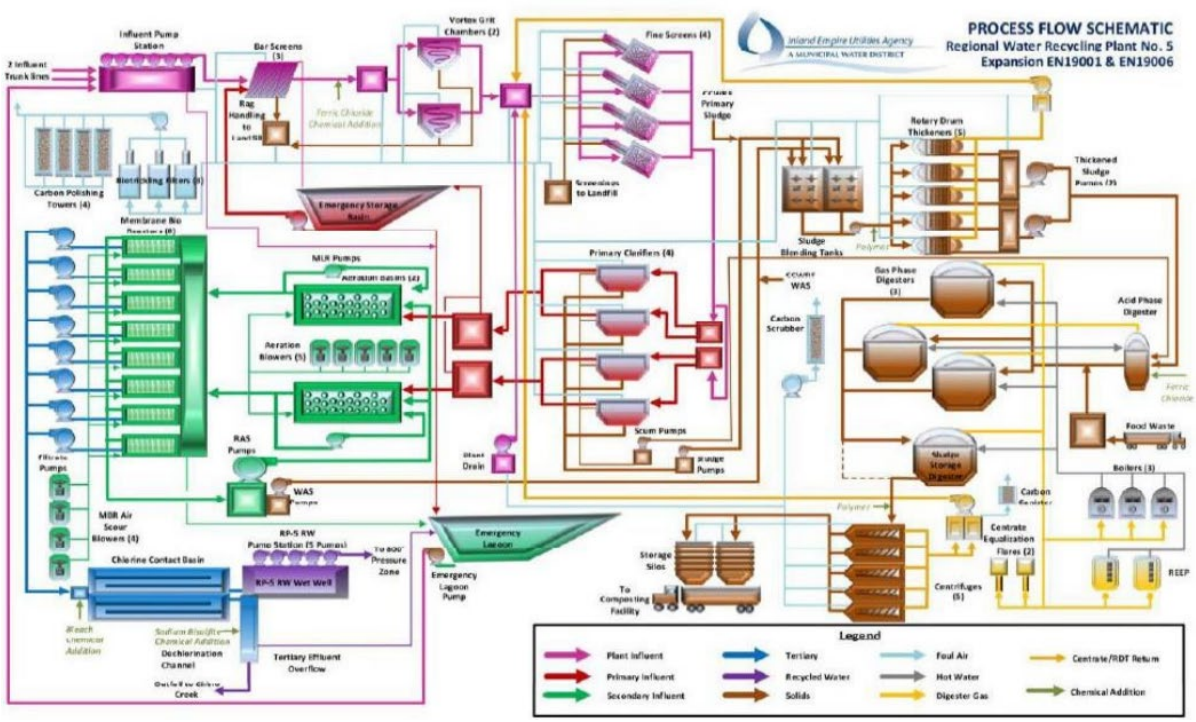
[1] See Table F-3: Discharge Points and Receiving Waters of NPDES Permit: https://www.waterboards.ca.gov/santaana/board_decisions/adopted_orders/orders/2022/ieua_rwrfs_wdrs_order_no_r8-2022-0041_final_esigned.pdf

Figure 5 Regional Water Recycling Plant No. 5



Source: NPDES Permit Attachment C

Figure 6 Regional Water Recycling Plant No.5 Process Flow Schematic by 2024



Source: NPDES Permit Attachment C

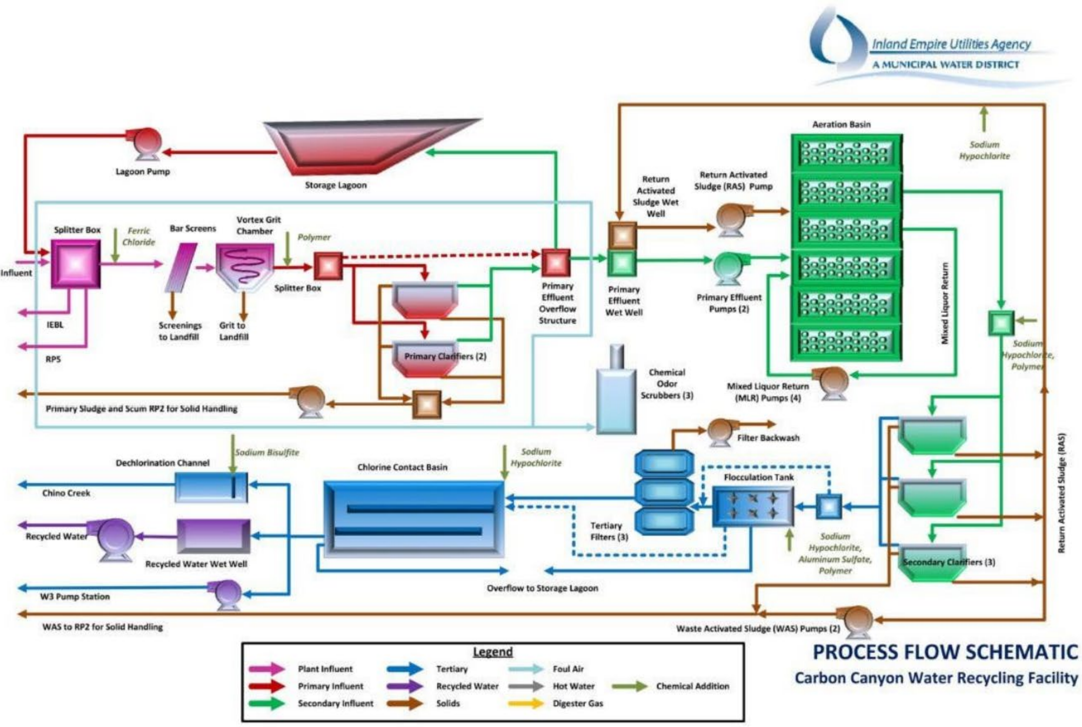
Carbon Canyon Water Recycling Facility

CCWRF serves the same cities and agencies as RP-5, as well as some unincorporated areas of San Bernardino County. CCWRF is located at 14950 Telephone Avenue, Chino. CCWRF serves a population of 92,874.

CCWRF Inflows & Outflows

CCWRF receives wastewater directly at the plant influent splitter box. After passing through preliminary, primary, secondary, and tertiary treatment, as shown in Figure 7, overflow goes to the storage lagoon and recycled water exits CCWRF, with tertiary flows discharged to Reach 2 of the Chino Creek. Similar to RP-5, recycled water is used for irrigation, landscape and industrial use.

Figure 7 Carbon Canyon Water Recycling Facility



Operations Overview

IEUA operates 24 hours per day, 7 days per week. Facility operations are primarily dependent on uninterrupted electricity and natural gas delivery purchased from Southern California Edison (SCE); the Direct Access (DA) program for industrial electricity users from Shell Energy North America; and Southern California Gas Company (SCG). This purchased natural gas and electricity is supplemented by on-site renewable power generation including solar and wind power, and anaerobic digester produced biogas. Emergency diesel generators are in place to provide backup power in case of power outage. IEUA's various plants and operations are staffed daily by 345 employees, who are dependent on road and transit infrastructure to work at IEUA (IEUA 2017, 2021a).

Mitigation Sites Approved by the Regional Water Quality Control Board (RWQCB)

As stipulated by RWQCB Order No. R8-2022-0041, NPDES No. CA8000409, Special Provision 5, the CCAP must address impacts to the mitigation site(s) approved by the Santa Ana RWQCB.

The ongoing observation and maintenance of mitigation sites listed below have no direct connection to the Facilities, or operations of the Facilities covered by the permit (RP-1, RP-4, RP-5, and CCWF). However, as the following mitigation site was approved by the Santa Ana RWQCB, associated climate risks are addressed in this report as stipulated by the NPDES permit.

Mitigation Sites Approved by the Santa Ana Water Board

The Santa Ana RWQCB has approved one mitigation site (IEUA RP-3 Basin #2 Conservation Easement [CE]) to provide mitigation associated with the Chino Basin Facilities Improvement Program, pursuant to the requirements of Clean Water Act Section 404 Nationwide Permit No. 200300490-RRS as issued by the United States Army Corps of Engineers, and Clean Water Act Section 401 Water Quality Certification (File No. 362003-05) as issued by the Santa Ana RWQCB. The CE is comprised of 6.5 acres of upland scrub, riparian woodland and wetland habitats, located in Fontana in San Bernardino County, within a portion of APN 0237-411-09 (Figure 8). The CE is situated directly adjacent to several IEUA-managed groundwater recharge percolation basins and is bounded by a gravel service road. A concrete-lined water distribution channel borders the CE to the north and east. Declez Channel, a manmade concrete-lined flood control channel, borders the CE to the south.

Figure 8 Conservation Easement

The vegetation in the CE area is primarily sustained by diverting water flows from Declez Channel to the south. Water diversions occur when the inflatable dam in the channel is raised, resulting in water flows entering the concrete-lined water distribution channel directly east of the CE. Lower flow diversions, typical of days with no rainfall, passively enter the CE via an off-site water inlet structure upon encountering a 16-inch tall curb located across the distribution channel. Higher flow diversions, typical of days with rain, can enter the CE to the extent the flows do not spill over the curb. Flows that spill over the curb continue to the other recharge basins located on the parcel. During very high flows in the Declez Channel, the rubber dam may be temporarily deflated and diversions suspended.

Since September 2018, the Rivers & Lands Conservancy (RLC) is responsible for long-term maintenance, stewardship, and easement compliance monitoring of the CE. The most recent CE 2022 Annual Monitoring Report (RLC 2022) and CE Baseline Report (RLC 2017) conclude the CE provides conservation values including natural vegetation communities that provide forage, cover, and nesting habitat for birds and other wildlife, as well as water quality benefits such as groundwater recharge and sediment retention.

1.3 Report Organization

This report is organized as follows to meet the requirements of Special Provision 5:

- **Section 1** provides background on IEUA Facilities and their operations, how the Plan will support compliance with the Order, and how the Plan is structured.
- **Section 2** provides an overview of regional climate change impacts on the Facilities and their operations. The identified impacts are numbered so that steps identified in Section 3 can be linked back to specific impacts.
- **Section 3** identifies the steps taken by IEUA to address greenhouse gas (GHG) emissions associated with the Facilities and potential impacts of climate change. The steps are categorized according to the potential climate change impacts identified in Section 2.
- **Section 4** provides any necessary adjustments to the Order based on any gaps identified in Sections 2 and 3.
- **Section 5** provides the financing needs to pay for actions identified in Section 3.
- **Section 6** describes how the CCAP will conform with plans and requirements by other agencies, including, but not limited to, the California Air Resources Board (CARB), and South Coast Air Quality Management District (SCAQMD).
- **Section 7** presents a schedule for updating the CCAP moving forward.

2 Projected Regional Impacts on the Facility and Operations Due to Climate Change

2.1 Introduction and Climate Science

Scientific consensus is that climate change is caused by the addition of excess greenhouse gases (GHGs) to the atmosphere, which trap heat near the Earth's surface and raise global average temperatures in what is referred to as the greenhouse effect. This increase in average temperatures across the globe affects sea level, precipitation patterns, the severity of wildfires, the prevalence of extreme heat events, water supply, and ocean temperatures and chemistry. Some of these changes, like droughts, wildfires, and extreme rainfall, are happening faster than previously assessed by scientists (NASA 2023). According to the Intergovernmental Panel on Climate Change (IPCC), the observed changes in our global climate, some of which are irreversible over the next hundreds or thousands of years, have never been seen or experienced by modern humans. Atmospheric GHG concentrations are now higher than they have been in the past 400,000 years, raising carbon dioxide levels from 280 parts per million to 410 parts per million over the past 150 years (IPCC 2022). The dramatic increase in GHGs is attributed to human activities beginning with the industrial revolution in the 1800s, which represented a shift from an agrarian and handicraft-based economy to one dominated by industry and machine manufacturing (NASA 2023).

California is already experiencing climate change, with effects expected to increase over the coming decades. These effects include increasing temperature, rising seas, declining snowpack, increasing heavy precipitation, higher frequency of drought, and more acres burned by wildfire, which will be experienced across the state (Bedsworth et al. 2018). The following overview of regional climate impacts was conducted using best available scientific literature and regional climate analysis to describe the impacts of climate change on the IEUA service area in the San Bernardino Region.

Per California's Fourth Climate Change Assessment, the Los Angeles region, which encompasses the service area, will be increasingly impacted by climate change in several ways (Hall et al. 2018). Projected changes relevant to IEUA facilities and operations include increasing temperatures, more frequent and intense heat waves, extended periods of drought, more intense rainfall events and flood potential, and increased wildfire risk. Below are key projections of regional climate impacts. For reference, the impacts assessed in this section are referenced by number.

- Air temperature is projected to increase, including the potential for more intense and longer duration extreme heat waves to occur more frequently, particularly in the interior areas of the San Bernardino region where IEUA facilities are located. (Impacts 5, 6)
- Precipitation, which is already highly variable, is projected to increase. This will result in a greater likelihood of extended periods of drought and more frequent and intense extreme storm events. (Impacts 1, 2, 3, 4)
- Wildfire risk will generally increase in the future as the climate warms, though there are still significant uncertainties in projecting wildfire increases in existing models. The risk for wildfires driven by Santa Ana wind events in the summer and fall will likely increase as a result of dry vegetation and low precipitation. (Impacts 7, 8)

Potential impacts to IEUA facilities and operations associated with climate change were evaluated with respect to the facilities covered under the scope of the NPDES permit. Potential climate change impacts to Santa Ana RWQCB-approved mitigation sites were also evaluated. These facilities were then mapped against mid-century climate change projections, consistent with the approach the State of California uses to measure climate impact projections (mid-century, California Fourth Climate Change Assessment), mapped against the State of California's carbon neutrality by 2045 target (Assembly Bill 32, CARB 2022 Scoping Plan, Assembly Bill 1279).

Potential climate change impacts on IEUA facilities and operations covered under the NPDES permit are thus defined as changes in different types of risks projected into the mid-century. For most types of risk (i.e., extreme heat and volatile rain), an increase in either its frequency or severity is examined relative to climate change projections.

This section is organized by type of climate change risk, including flooding and volatile wet weather, wet and dry extremes, temperatures, and wildfires. The potential impacts of climate change are numbered and discussed under each type of risk. In Section 3, *Steps Being Taken or Planned to Mitigate Climate Impacts*, steps to address potential climate change impacts are structured to correspond with the numbered impacts.

2.2 Climate Impact on Facilities - Overview

This climate change impact analysis is based on best-available-science (California's Fourth Climate Change Assessment), and a thorough review of IEUA internal documents, supplemented by two Climate Risk Assessment & Mitigation workshops conducted with IEUA employees in June of 2023. Workshop attendees from IEUA included leadership from the Operations, Asset Management, Maintenance, Engineering and Construction, and Planning and Resources departments within the organization.

Workshop 1 focused on existing IEUA leadership experiences of climate risks[2] to IEUA facilities and resulted in a prioritized list of facility climate impacts, which are characterized in Section 2.3.

Workshop 2 mapped the prioritized list of facility impacts to existing and planned risk mitigation measures. The resulting list of existing and planned climate risk mitigation measures was used to assess IEUA facility readiness and resilience and identify gaps for future IEUA climate risk mitigation measures, which are characterized in Section 3.

2.3 Climate Risk and Facility Impact Overview

Table 2 summarizes climate risks by climate hazard as outlined in this section.

[2] Climate risks assessed included: volatile dry weather, volatile wet weather, power outages (extreme heat waves, public safety power shutoff), increased wind load events, wildfire events, volatile dry weather.

Table 2 Summary of Regional Climate Risk Impacts on Facility

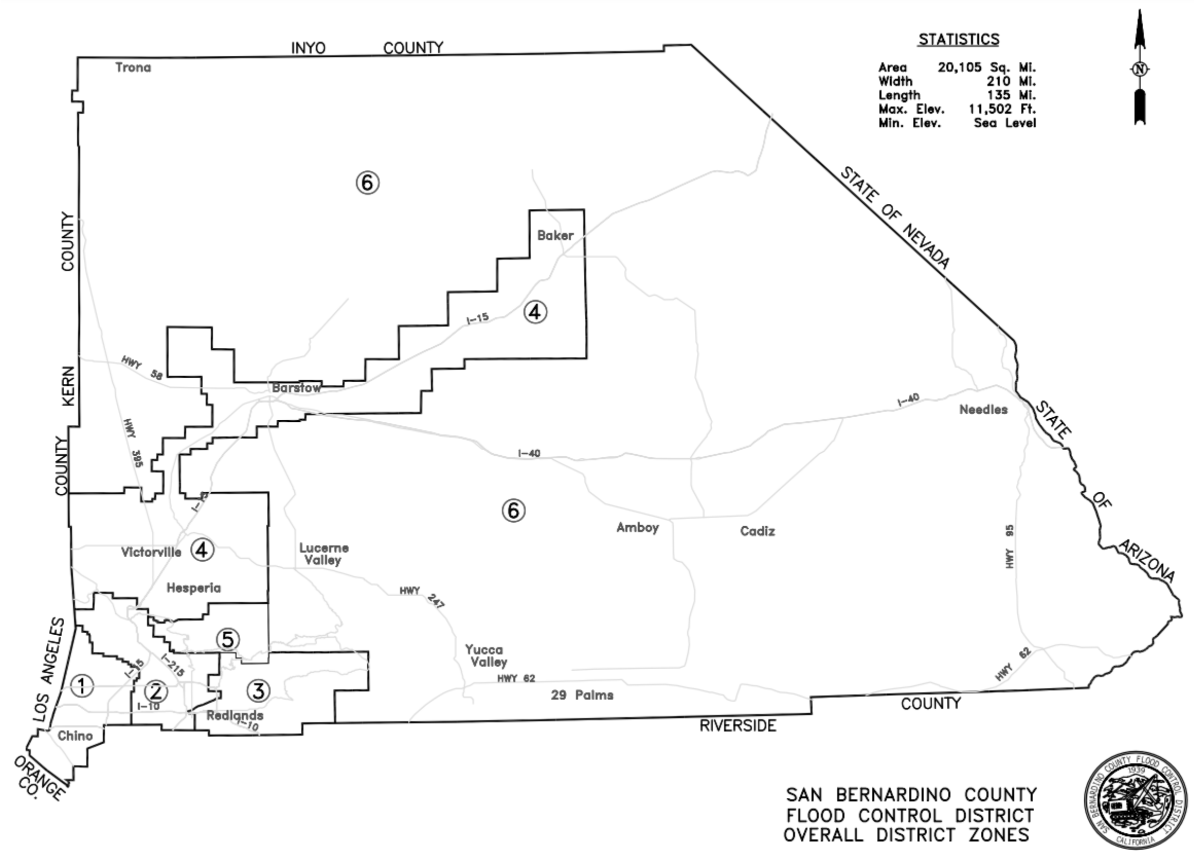
Projected Regional Climate Impacts	Potential Facility Impact
2.4 Flooding and Volatile Wet Weather	Impact 1: On-site flooding caused by rain events at regional plants
2.5 Wet and Dry Extreme Weather	Impact 2: Wastewater dilution due to Infiltration and Inflow Impact 2 includes: process control impacts due to infiltration and inflow, runoff storage capacity challenges Impact 3: Changes to effluent discharge Impact 4: Drought-induced vegetation stress within conservation easement
2.6 Temperature	Impact 5: Power disruptions and excessive heat on VFDs and energized equipment Impact 6: Increased temperatures on vegetation within conservation easement
2.7 Wildfires	Impact 7: Reference Impact 4, as PSPS caused by wildfire and risk of wildfire can also lead to the same Facility impact Impact 8: Wildfire impacts to conservation easement

2.4 Flooding and Volatile Wet Weather

Per California's Fourth Climate Assessment, wet extremes, and instances of extreme precipitation events are expected to increase in the future. There may be a longer peak season for atmospheric rivers in the Los Angeles region, which could lead to an extended flood-hazard season. The projected increase in precipitation extremes is also expected to intersect with the impacts of increased wildfire. Wildfire strips land of vegetation, decreasing the ability of natural systems to prevent erosion and reduce flood risk. Together, these intersecting risks of extreme precipitation and increased instance of wildfires may increase risk and severity of floods, debris flows, and mudslides (Hall et al. 2018). The flooding can directly impact critical infrastructure, including IEUA facilities.

According to the San Bernardino County Flood Control Zone Map, IEUA facilities are encompassed by multiple County Flood Control District Zones, as shown in Figure 9.

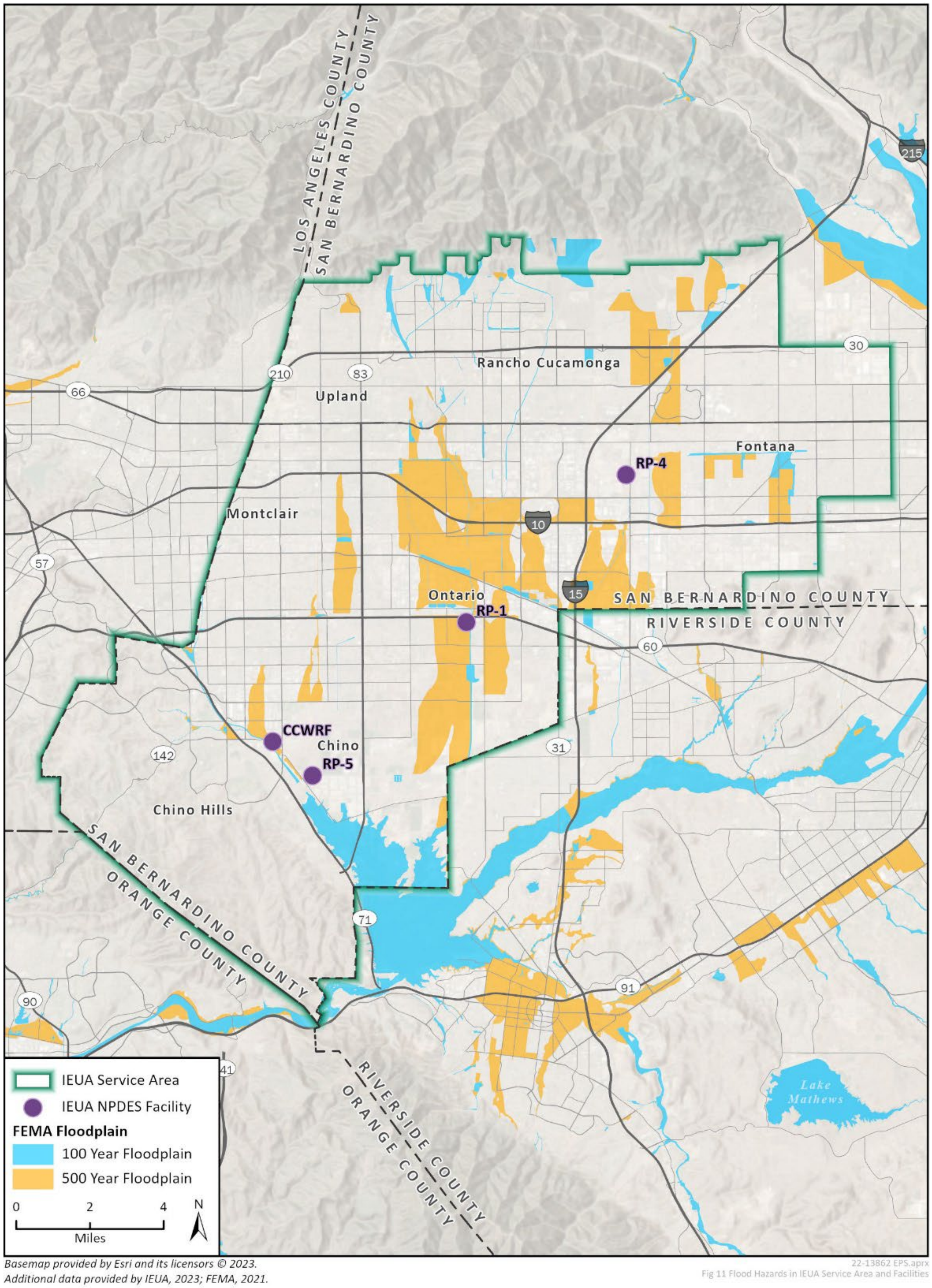
Figure 9 San Bernardino County Flood Control District Overall Zones



Source: San Bernardino County Flood Control Map (2022)

According to the San Bernardino County Multi-Jurisdictional Hazard Mitigation Plan, there were ten severe weather events that have led to flooding between 2010 and 2016 in the county (San Berardino County, 2022). Analysis of San Bernardino Flood Hazard Severity (100-year and 500-year flood zones) is depicted in Figure 10.

Figure 10 IEUA Service Area and IEUA NPDES Facilities Flood Severity Zone Map



Source: IEUA Data (NPDES Facilities & Service Area); Flood zones: FEMA, 2021

Impact 1: On-site Flooding Caused by Rain Events at Regional Plants

Rain events are widely expected to increase in duration and intensity due to climate change. Flooding, directly attributed to heavy rain events, is defined in this section as inundation due to rainfall within the area of the four existing treatment plants. This includes, but is not limited to, flooding from runoff collection, inundation of the stormwater attenuation systems, or flooding of the surface area within the Facilities themselves (ponding). No impact is anticipated for this identified threat. Historically there have not been any known or observed impacts to electrical or mechanical equipment due to flooding caused by rain events and IEUA staff did not identify on-site flood risk as high because of the large volume of stormwater storage capabilities. However, the on-site stormwater collection systems are generally designed for probabilistic storm events and may prove to be challenged as higher intensity storms become more frequent. This may require additional analysis in the future and increased storage volume for stormwater detention.

No impact to the CE site is anticipated for this threat, as the hydrologic regime of the CE is managed by diversions from the Declez Channel, which can be suspended in the event of flood events.

2.5 Wet and Dry Extreme Weather

Wet Extremes: Volatile Rain

Per California's Fourth Climate Assessment, precipitation in the Los Angeles region is highly variable from year to year, with five storms typically producing as much as 50% of the region's total annual precipitation. Dry and wet extremes are both expected to increase in the future. Historically, annual total precipitation in Western San Bernardino County is approximately 19.3 inches (Cal-Adapt 2023).

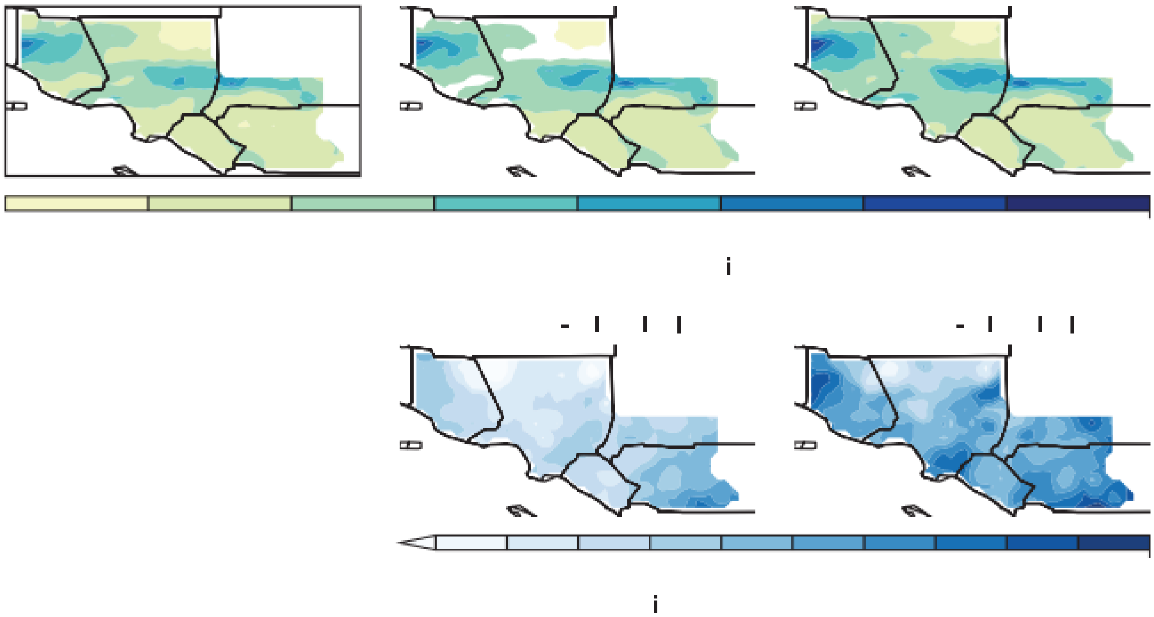
Like other California regions, the high year-to-year variability of precipitation in the Los Angeles region is heavily influenced by the occurrence of extreme precipitation events. Atmospheric river events are expected become more frequent under future climate conditions, potentially doubling in number annually by the end of century.[3] By the late 21st century, the wettest day of the year is expected to increase 25 to 30% from the historical baseline (RCP 8.5) (Figure 11). Extreme rain events can also trigger potentially catastrophic mudslides and floods (Hall et al. 2018).

Dry Extremes: Drought

Southern California is prone to periods of extremely dry conditions. Under RCP 8.5, the Southwest region, which includes California, is predicted to experience more than an 80% of multi-decadal drought (Hall et al. 2018). As drought conditions may prolong and worsen, IEUA's baseline supplies may be insufficient to meet future demands for water, which are projected to increase over time (IEUA 2018). The U.S. Drought Monitor characterizes areas within San Berardino County, which encompasses IEUA service area, as Abnormally Dry (D0) and Moderate Drought (D1), as of August 2023. Drought intensity ranges from None to Exceptional Drought (D4). Shown below in Figure 12 is the drought status of San Bernardino County for the past 23 years. The county experienced Moderate to Exceptional drought periods 78% of the time, specifically 2002-2004, 2006-2009, 2012-2018, and 2020-2023.

[3] Atmospheric rivers are regions of high water vapor transport from the tropics to the Pacific Coast that produce intense topographic-induced precipitation along the mountains of southern California (for example, the series of atmospheric river events experienced in the winter of 2023)

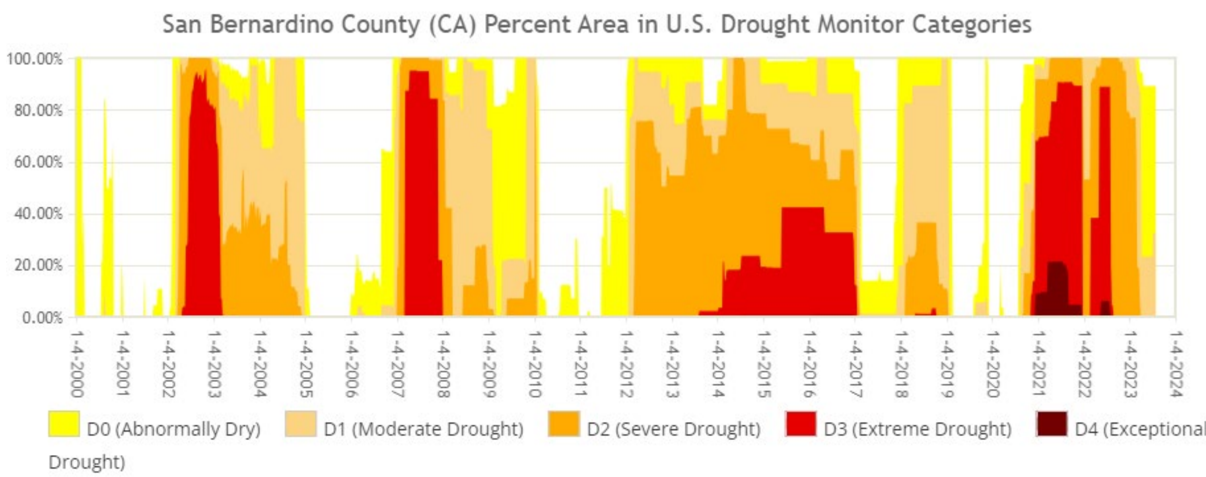
Figure 11 Projected Change in Precipitation (Average Wettest Day of the Year)



Top row: Average wettest day of the year in the historical (1976-2005) period and in the late-21st century (2070-2100) under RCP4.5 and RCP8.5. Unit is inches. Bottom row: change (late-21st century minus historical) in the wettest day of the year under RCP4.5 and RCP8.5. Unit is percent.

Source: C*alifornia's Fourth Assessment, Los Angeles Region Report, 2018*

Figure 12 Drought in San Berardino County (2000-2023)



Source: U.S. Drought Monitor*: https://droughtmonitor.unl.edu/DmData/TimeSeries.aspx, accessed 08/09/2023*

Impact 2: Wastewater Dilution due to Infiltration and Inflow

Infiltration and inflow (I/I) from increased storm durations and intensity is expected to impact the wastewater collection systems and make its way into the respective Regional Water Recycling Plants (RPs). Infiltration is described as elevated groundwater entering the collection system through defective joints and pipes, while inflow is described as stormwater runoff that enters through connection points such as sumps, manhole openings, and other non-defective but not appropriate connections. This increase in flow is expected to have a dilution effect on the influent wastewater at the permitted plants and has been identified as a potential impact to process equipment and performance. This includes dilution of the biological process loading constituents and exceedance of the rated hydraulic capacity of various unit processes. Historically, there have not been any known or observed hydraulic impacts from increased wastewater flows because of I/I within the various treatment plants and no impact is currently anticipated. However, the existing wastewater collection systems may prove to be challenged as higher intensity storms in the region become more frequent.

Impact 2 also pertains to I/I impacts on process controls, as well as runoff storage capacity challenges.

Impact 3: Changes to Effluent Discharge

Changes in effluent discharge from the respective RPs have been identified as a potential threat due to the expected volatility for both wet and dry weather. Extended dry conditions can often lead to the limits being placed on water usage, ultimately resulting in higher concentrations of various contaminants in the wastewater entering the treatment plants. This may have an impact on the process and hydraulic performance of key equipment items as well as the dilution credits required for discharge. Direct changes to temperature of wastewater either through cold dilution or extended heat have not been attributed to any upsets in process conditions thus far.

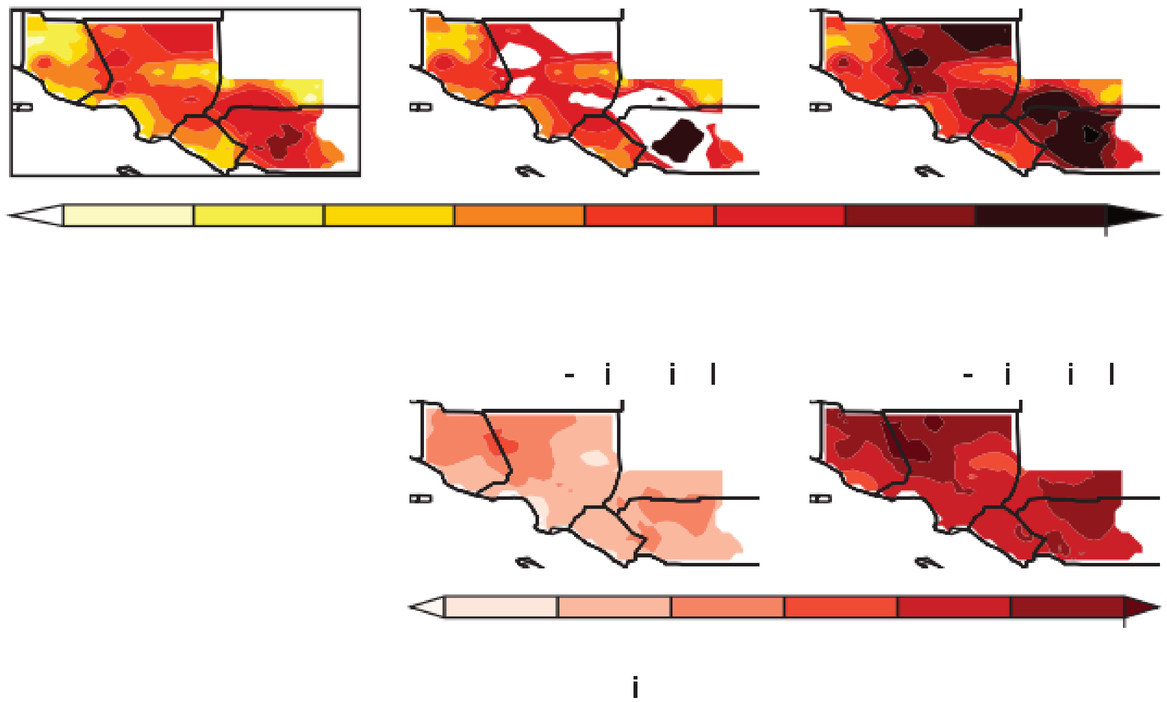
Impact 4: Drought-Induced Vegetation Stress within Conservation Easement

Severe drought can induce vegetation mortality due to reduced photosynthesis and enhanced respiration. Thus, more frequent and intense drought periods (and the consequent death of plant species) can alter the composition and functional groups of entire plant communities over time (da Silva et al. 2013) and can result in reductions in the services they provide (Luce et al. 2016). Within the CE, drought-induced stress to plants could result in reduced productivity, defoliation, or mortality, and may result in a transition from riparian and wetland-associated communities to a species assemblage more tolerant of drought conditions. This would be expected to reduce available foraging and nesting habitat available for wildlife (Zedler and Kercher 2005), degrading the ecosystem services provided by the CE.

2.6 Temperature

Across western San Bernardino County, temperatures are projected to increase as a result of climate change, including the duration and intensity of heat waves. Interior regions, where IEUA facilities are located, are expected to experience the highest amounts of temperature increase in the region, with up to 8.6°F of warming by late-century (2070-2100) (Hall et al. 2018). By mid-century, western San Bernardino County is projected to experience a 4.3 to 5.2°F increase in annual average maximum temperature and experience 13 to 17 more days in which the daily maximum temperature exceeds 103.2°F (Cal-Adapt 2023). Projected change in temperature in the Los Angeles region for mid-to-late century is depicted in Figure 13.

Figure 13 Projected Change in Temperature in the Los Angeles Region



Top row: Average hottest day of the year in the historical (1976-2005) period, and in the late-21st century (2070-2100) under RCP4.5 and RCP8.5. Bottom row: change (late-21st century minus historical) in the hottest day of the year under RCP4.5 and RCP8.5. Unit is °F.

Source: 2018, *California's Fourth Assessment Los Angeles Regional Report*

Impact 5: Power Disruptions and Excessive Heat on VFDs and Energized Equipment

Prolonged and elevated temperatures have the potential to directly impact the performance of many mechanical, electrical, and instrumentation systems. This includes risk of older mechanical motor starters overheating, specifically the existing Variable Frequency Drives (VFDs) and can indirectly affect performance of various equipment items in the form of downtime, reliability, and redundancy. Also, high ambient air temperatures can lead to more frequent rolling blackouts, which also takes a toll on the VFDs, further increasing the potential for failure and risk of offline equipment. Electrical components sensitive to air temperature are typically provided with air conditioning to keep the environment cool, both for indoor motor control centers (MCCs) and outdoor temperature sensitive components. If the air conditioning were to fail during extreme high temperatures, the equipment would be at higher risk of overheating and malfunction.

Extreme heat also has the potential to cause disruptions to the regional power grid, which could affect Facility operations. The risk of power outages in California has increased in recent years. For example, a heat wave in August 2020 caused California electricity demand to exceed supply, which resulted in the State grid operator resorting to scheduled blackouts, affecting 800,000 homes and businesses. This higher-than-usual electrical peak is driven by air conditioning electrical load as a response to extreme heat. The State is planning to match these higher peaks through updated grid-planning efforts, and these scheduled power outages avoided total blackout of the bulk power system, which would have taken days or weeks to fix, instead of the minutes or hours spent to restore power. The California Independent System Operator has also had a successful record of sending customers texts to reduce electric demand, reducing the need for scheduled blackouts (Blaustein 2022). Last year (2022), California avoided blackouts by declaring a state of emergency to buoy energy supplies by temporarily allowing power plants to work overtime and deploying backup generators (Office of the Governor 2022). It should be noted that rolling blackouts within the IEUA service area do not always affect Facility operations, since SCE typically attempts to maintain power at locations that provide essential services to the community. Though considered a secondary threat due to widespread availability of short-term backup power at IEUA Facilities, a regional power outage would require additional operational steps to be taken to operate the backup diesel generators at each facility.

Impact 6: Increased Temperatures on Vegetation within Conservation Easement

Rising global surface temperatures will increase vapor pressure deficit (VPD, the difference between the saturation vapor pressure and the actual vapor pressure) in a nonlinear way, where VPD is increasingly higher with warming temperatures (Breshears et al. 2013). Increased VPD substantially affects basic plant and animal physiological processes, leading to increased mortality (Will et al. 2013; Johnston et al. 2019). Although temperature effects could be secondary to the primary drought effect (Hoover et al. 2014), the added stress of increased temperature on vegetation can be significant (Adams et al. 2009). In concert with increased intensity and duration of drought events, increased temperatures may result in reduced productivity, defoliation, or mortality of wetland plant assemblages within the CE.

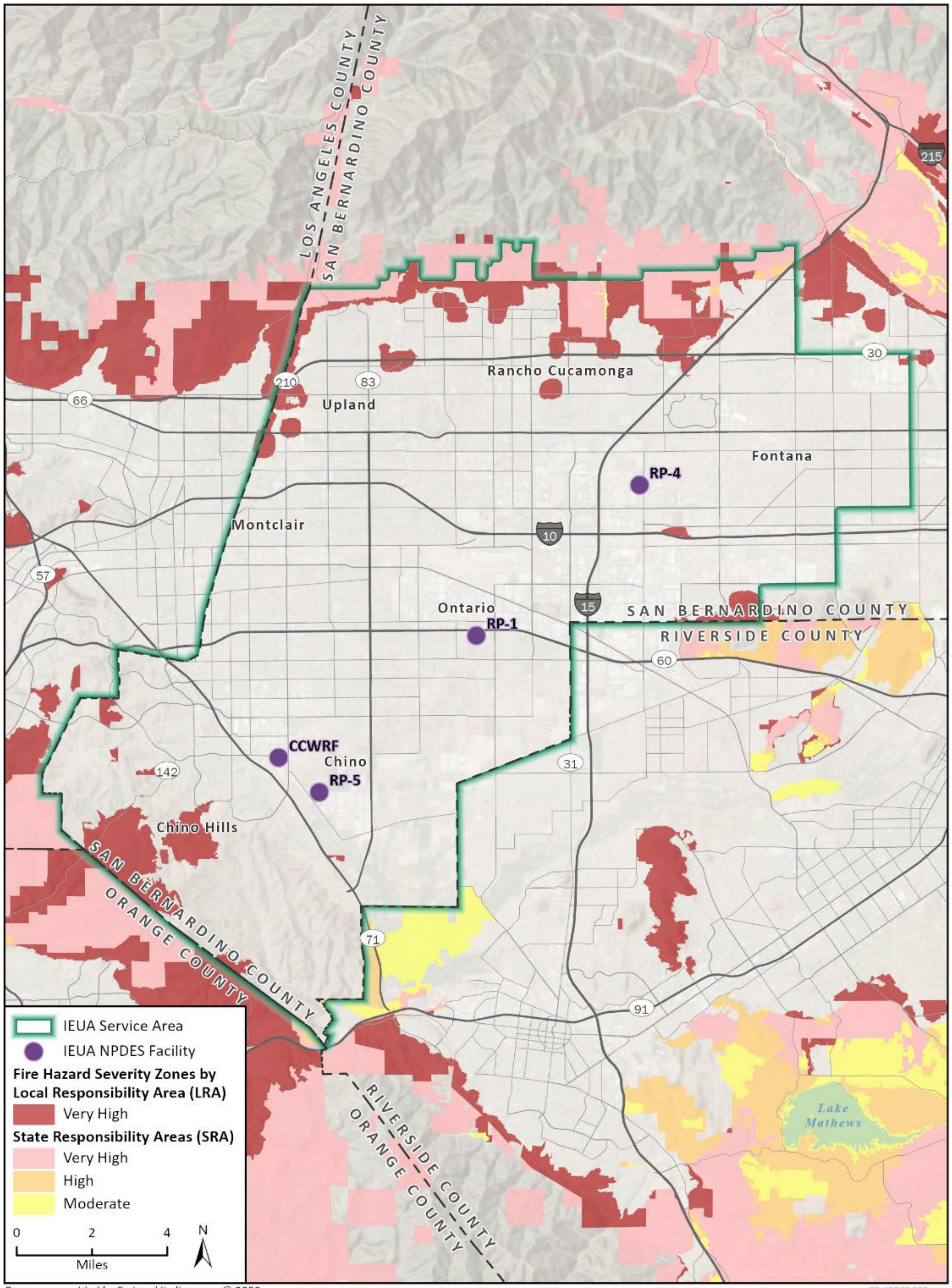
2.7 Wildfires

Per California's Fourth Climate Assessment, wildfire risk is expected to rise across San Bernardino County. By mid-century, the county is projected to experience an increase in burned acreage ranging from 1,854 to 1,875 acres. Between 2010 and 2016, there were 13 significant wildland fire events within San Bernardino County (County of San Bernardino 2017). Though wildfire modeling is evolving, and predicting fire danger, which is variable based on weather, topography, and vegetation distribution, is complex, much of California can expect a wildfire season that is more extreme, starts earlier, and runs longer.

Santa Ana winds will continue to be a key driver of Los Angeles region wildfires, and they will likely become hotter even relative to background warming. Projected changes in the precipitation regime (Section 2.3), with increasing drought, will increase wildfire risk during the dangerous fire weather conditions Santa Ana winds create, especially during the peak season in December and January (Hall et al. 2018). Santa Ana winds that co-occur with dry fuels are responsible for a disproportionate fraction of both areas burned (Kolden and Abatzoglou 2018) and wildlife losses in much of California (Jin et al. 2015; Bowman et al. 2017).

As shown in Figure 14, existing and future wildfire risk to IEUA Facilities as a result of climate change can be considered low because of their distance from CAL FIRE-designated Wildfire Fire Hazard Severity Zones. The Cities of Chino Hills, Ontario, Rancho Cucamonga, Fontana, Upland, and Montclair provide fire protection and preparedness services in the area where the IEUA Facilities are located. The Fire Department provides guidance on wildfire preparedness, including defensible space inspections. However, there are indirect regional wildfire impacts that could have greater impact on the IEUA, including air quality (smoke) emergencies and power disruptions associated with wildfire events.

Figure 14 Wildfire Risk to IEUA Service Area and NPDES Facilities



Basemap provided by Esri and its licensors © 2023.
Additional data provided by IEUA, 2023, CALFIRE 2007, 2011 & 2012.

22-13862 EPS.aprx
Fig 13 Fire Hazards in IEUA Service Area and Facilities

Impact 7: Power Disruptions and Excessive Heat on VFDs and Energized Equipment

Electric power as supplied by SCE and the DA program[4] may be impacted during wildfire events, or when wildfire risk is determined to be elevated. Between 2000 and 2016, wildfires in California cost utilities over $700 million in transmission and distribution (T&D) related damages, which impacted localized electricity availability, but did not cause statewide blackouts (California Energy Commission 2018). In the future, elevated risk of wildfire could cause power outages through direct wildfire impacts to T&D that affect electric power availability to IEUA Facilities. Though considered a secondary threat due to widespread availability of short-term backup power at IEUA Facilities, the SCE public safety power shutoff (PSPS) policy gathers fire science and meteorological data to forecast wildfire condition risk before shutting off power (SCE 2023).[5]

Investor Owned Utilities (IOU) are still responsible for the transmission and distribution of electricity for direct access customers, meaning that DA electricity would be subject to the SCE PSPS program rules (California Energy Commission 2023).

As with extreme heat (Section 2.6), a wildfire risk-related power shutoff could impact Facility operations, as the IEUA is dependent on electricity to operate, which is why Impact 7 is similar across "Temperature" and "Wildfire" climate risk sections.

Impact 8: Wildfire Impacts to Conservation Easement

Projected temperature and precipitation trends will result in an increased risk that Santa Ana wind events will coincide with critically dry fuels, increasing the potential for wildfire (Goss et al. 2020). Wildfire impacts to the CE would be expected to reduce available foraging and nesting habitat available for wildlife degrading the ecosystem services provided by the CE. However, in many cases shrublands and wetlands can recover through natural processes after fire (Calvo et al. 2011).

[4] The Direct Access (DA) program allows for the purchase of electricity from an electric service provider that is a non-utility entity that offers electric service to customers within the service territory of an electric utility. As noted in the FY 21-11 Energy Report, DA rates allow for overall cost reduction through cheaper rates for industrial electricity consumers like IEUA. DA electricity currently supplies the power at RP-1, RP-2, and CCWRF from Shell Energy North America. However, this Master Energy Sales Agreement (MESA), expired on June 30, 2023.

[5] https://www.sce.com/outage-center/outage-information/psps

3 Steps Being Taken or Planned to Mitigate Climate Impacts

3.1 Facility Steps to Mitigate Climate Impacts

Table 3 below summarizes planned and existing mitigation measures undertaken by IEUA. Facility steps to mitigate GHG impacts are described in Section 8, *Future GHG Emissions*.

Table 3 Summary of Mitigation Measures Taken*

Facility Impacts	Planned Steps for Mitigation
Impact 1: On-site flooding caused by rain events at regional plants	Mitigation Measure 1.1: Rain event storage capabilities Mitigation Measure 1.2: Planned I/I study
Impact 2: Wastewater dilution due to infiltration and inflow	*Mitigation Measure 2.1 Planned I/I study (Ref: Mitigation 1.2)* *Mitigation Measure 2.3: Rain event storage capabilities (Ref: Mitigation 1.1)*
Impact 3: Changes to effluent discharge	Mitigation Measure 3.1: TDS concentration management Mitigation Measure 3.2: Monitor influent wastewater strength Mitigation Measure 3.4: Ongoing staff education
Impact 4: Drought-induced vegetation stress within CE	Mitigation Measure 4.1: CE monitoring and adaptive management
Impact 5: Power disruptions and excessive heat on VFDs and energized equipment	Mitigation Measure 5.1 Existing on-site generators Mitigation Measure 5.2: Spare VFDs Mitigation Measure 5.3: Conditioned MCCs and outside panels Mitigation Measure 5.4: On-call electrical contractors Mitigation Measure 5.5: On-call electrical contractors
Impact 6: Increased temperatures on vegetation within conservation easement	*Reference Mitigation Measure 4.1, as the mitigation for increased vegetation stress from temperatures mirrors the actions taken under Impact 4*
Impact 7: Power disruptions and excessive heat on VFDs and energized equipment *Reference Impact 5, as PSPS caused by wildfire and risk of wildfire can also lead to the same impact*	*Reference Mitigation Measure 5.1, as PSPS caused by wildfire and risk of wildfire can also lead to the same impact*
Impact 8: Wildfire impacts to conservation easement	*Reference Mitigation Measure 4.1, as the mitigation for increased vegetation stress from temperatures mirrors the measures taken under Impact 4*

* GHG mitigation measures 9.1-9.3 can be found under Section 8, Future GHG Emissions

3.2 Flooding Risks & Volatile Wet Weather Mitigation Measures

The following sections discuss the existing, planned or potential mitigation measures for Impact 1, as identified in Section 2.2.

Mitigation Measures for Impact 1: Flooding; Inflow

1.1 Rain Event Storage Capabilities

Each RP is currently capable of diverting and containing runoff on site that can be directed to the plant drain system and pumped back into the treatment system (IEUA 2021c) as noted in IEUA's 2021 Operations & Maintenance Interim Emergency Response Plan (ERP). There are no known instances where the collection and drainage system has been overwhelmed with rainwater resulting in either flooding or hindered performance in any of the RPs. Additionally, heavy rain events have not been noted to have had any direct or indirect effects on electrical equipment, conduit, motors, or other energized equipment. Specific to RP-1, storm water flows generated on-site at RP-1 are collected and pumped into a liquid process stream for treatment. In the event that stormwater flows exceed the capacity to store and/or pump to a liquid process stream, stormwater may enter Reach 1 of Cucamonga Creek via S-001 or S-002.[6] Facility-wide, IEUA will continue to monitor the on-site storage available during rain events, as well as monitor any impacts in the treatment system and determine if and when further expansion of the on-site runoff collection systems is required.

1.2 Planned I/I Study

IEUA has identified the need for a long-term Sanitary Sewer Infiltration and Inflow (I/I) study in its service area, as part of a sewer condition assessment. I/I studies are used in locating possible deficiencies in the wastewater collection system that may allow storm or groundwater to enter the system. This study has been funded and is scheduled to begin FY26. Though the study will determine the impacts of I/I on the collections system, it will also determine the dilution impacts to the RPs. Conducting this study is a proactive measure for IEUA to begin establishing baselines through monitoring and capturing the impacts to better understand and effectively react to the potential of diluted wastewater and increase flow. The results will help prioritize and plan future wastewater maintenance and rehabilitation projects and will be integrated into a larger preventative maintenance program so that any issues can be proactively addressed. The study will evaluate both the Regional Sewer System and Brine Sewer System.

3.3 Wet and Dry Extremes (Volatile Rain and Drought) (3.3) Mitigation Measures

The following sections discuss the existing, planned or potential mitigation measures for Impact 2, Impact 3, Impact 4, and Impact 5, as identified in Section 2.3. It should be noted that Impacts 2 through 4 have the same mitigation measures as impacts identified in other sections and thus refer to those sections to describe the mitigation measures established.

[6] NPDES Permit page 171.

Mitigation Measure for Impact 2: Infiltration of Collection System: Dilution of Wastewater

Planned I/I Study

See Section 3.2, Mitigation Measure 1.2: I/I study.

Mitigation Measure for Impact 3: Infiltration of Collection System: Impact to Process Controls

Planned I/I Study

See Section 3.2, Mitigation Measure 1.2: I/I study.

Mitigation Measure for Impact 4: Challenges to On-site Storage Capacity

Rain Event Storage Capabilities

See Section 3.2, Mitigation Measure 1.1: Rain Event Storage Capabilities.

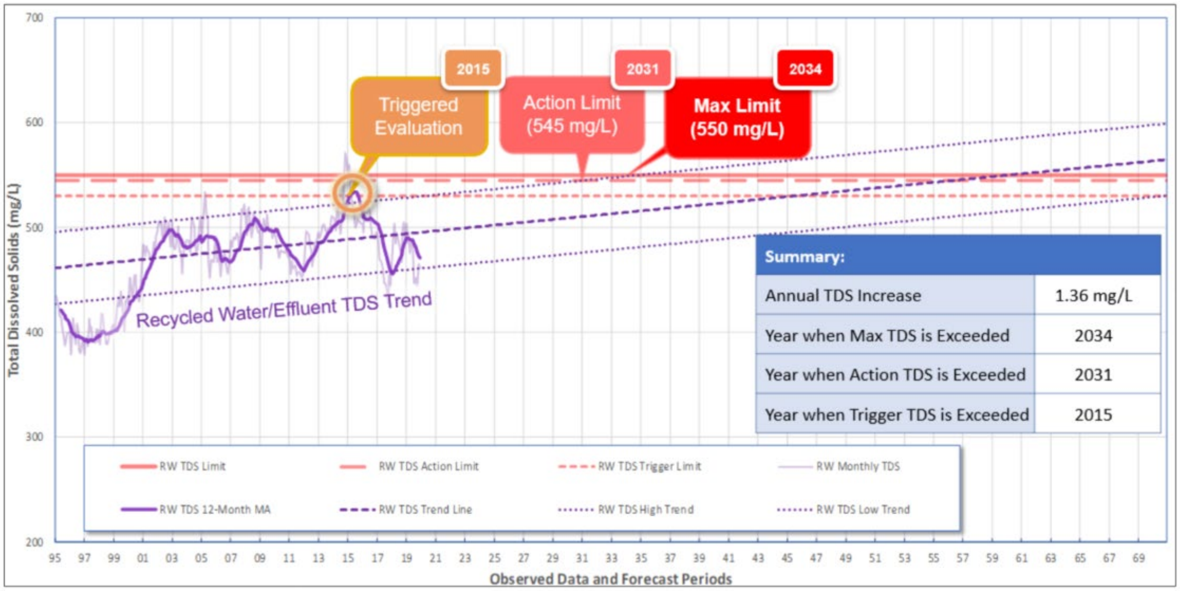
Mitigation Measures for Impact 3: Changes to Effluent Discharge and Potential TDS Increases

3.1 TDS Concentration Management

The concentration of discharged Total Dissolved Solids (TDS) has been documented to be gradually increasing in recent decades. IEUA monitors TDS in influent, effluent, and recycled water via composite samplers at the designated compliance locations. TDS is defined as the amount of organic and inorganic substances within water generally at a size of 2 microns or less. High levels of TDS have detrimental health effects to humans when consumed, as well as to plants and animals. It can also have negative and damaging effects on pipes and equipment.

TDS levels in recycled water are widely regarded to be intensifying due to overall effects of climate change, generally through gradual concentrating effects of drought, groundwater recharge, chemical usages, and other direct and indirect contributors. Many of these concentrating effects also impact State Water Project water, which is part of IEUA's source water portfolio. Consequently, this will result in increases in TDS concentration of the influent of the RPs. The 12-month flow weighted running average TDS concentration has been increasing towards the 550 milligram per liter limit over the past twenty years (IEUA 2020). Climate change will likely exacerbate this trend, potentially resulting in permit non-compliance and jeopardizing the region's water supply overall if the impacts are not mitigated, as seen in Figure 15. To address this issue, IEUA is proactively working on a mitigation plan and evaluating the implementation of an advanced water purification facility (AWPF) at RP4. The AWPF will be designed to reduce the TDS concentration to compliant levels.

Figure 15 Expected Trends in TDS Concentrations



Source: Inland Empire Utilities Agency 2020

3.2 Monitor Influent Wastewater Strength

California has already enacted legislation to require restricted indoor water usage throughout the state, greatly reducing the amount of water that contributes to the influent at the RPs. The current standard for indoor residential water use is 55 gallons per capita per day (gpcpd). Senate Bill 1157 legislation amends this reduce to standard to 47 gpcpd in 2025, then 42 gpcpd in 2030 (Legiscan 2023). This will likely increase the concentrations of the wastewater characteristics, such as biological oxygen demand (BOD), ammonia, and phosphorus. Though most plants are designed on a flows and loads basis, determining the impacts of higher concentrations will need to be understood. The RPs are not currently being impacted by increased loading; however, as a planned action, IEUA will continue to monitor the influent loadings at the RPs, as required by the permit, which will allow the IEUA to establish trendlines to identify any increases, decreases, and/or potential plant impacts over time. Monitoring over time allows for interpretation of data sets and preparation and planning so that the Facilities can adapt.

3.3 Ongoing Staff Education

In order to mitigate the potential for non-compliant effluent, it is important to understand each process and the key equipment and characteristics associated with effluent quality throughout the treatment train. For example, an operator should be able to identify if the secondary system is allowing for greater than typical concentration of solids to be carried over to the tertiary system. IEUA will continue to conduct its annual staff compliance training program to allow for early identification of non-compliant discharge from all equipment for each RP and help staff identify trends in different steps in the process that might potentially inform process changes or improvements in areas outside of their respective responsibility. In addition to the annual staff compliance training program, IEUA's operations staff also attends webinars and seminars on this topic.

Mitigation Measure for Impact 4: Drought-Induced Vegetation Stress within Conservation Easement

4.1 CE Monitoring and Adaptive Management

There are multi-layered climate risks including temperature-induced vegetation stress potentially leading to vegetation mortality, as well as wildfire impacts to foraging and nesting habitat available for wildlife in the CE. Adaptive management of this risk includes adding a climate impact section into the annual CE report prepared by the RLC for IEUA, which factors in temperature, vegetation die-off, and wildfire risk into annual reporting. Moving forward, the RLC will also propose specific remedies to combat climate risk for the CE, referencing best available science to increase drought, heat, and wildfire resilience of the site.

3.4 Temperature Mitigation Measures

The following sections discuss the existing, planned or potential mitigation measures for Impact 5, Impact 6, and Impact 7, as identified in Section 2.4.

Mitigation Measures for Impact 5: Impact of Power Disruptions and Heat on VFDs and Energized Equipment

5.1 Existing On-Site Generators

The existing 2021 Operations & Maintenance Interim ERP identifies the order of operations in the event of loss of power. The RPs are supplied power by SCE or the DA program from Shell Energy North America for each facility. The power is used to energize multiple MCCs which are used to energize the equipment throughout each facility. The ERP includes a step-by-step order of responding to short term, long term, and catastrophic failure for each site. Each RP is currently equipped with backup diesel powered generators for powering of critical equipment to allow for key process components to stay on-line and in service during extended power outages. IEUA owns and maintains seven portable generators that can be utilized in the event of power losses over multiple days and can be connected directly to the various MCCs (IEUA 2021c). Moving forward, IEUA will continue to keep backup generators in position and conduct scheduled electrical interruptions to practice for potentially more frequent power shut-off events. IEUA will also work with fuel suppliers to access diesel in the event of an extended power disruption.

5.2 Spare VFDs

VFDs are an integral part of operating the various RPs in an efficient manner. Electrical components are known for having long lead times for replacement. To mitigate this, IEUA maintains an inventory of commonly sized and swappable VFDs for ease of installation and reduced down times. IEUA relies on engineering processes in place to address aging infrastructure and equipment. This is accomplished with a New Project Request Form submitted by staff to request CIP support from engineering to address staff-identified issues. Specific to the issue of VFDs, IEUA has put a CIP to proactively upgrade units that have reached the end of their expected service life. This alleviates impacts to key equipment and processes. IEUA will continue to inventory and proactively manage its assets. To further protect itself from potential operational disruptions, IEUA will develop a response plan for damaged VFDs to enable streamlined repair and replacement to further reduce the possibility of more frequent power outages and high heat weather events.

5.3 Conditioned MCCs and Outside Panels

To prevent overheating, IEUA currently provides air conditioning to its MCCs. For outdoor rated panels, integrated air conditioners are also installed to maintain specification requirements. IEUA will continue to provide air conditioning as well as monitor the indoor and outdoor panel temperatures to understand if and when upsizing the air conditioning units is warranted. Additionally, ensuring the air conditioning system is connected to backup power will keep key equipment running during power outages.

5.4 On-Call Electrical Contractors

IEUA maintains an extensive list of on-call electrical contractors capable of extensive repairs and replacements when needed. This includes large or complex electrical components that could be damaged by extensive heat or through frequent and unexpected power outages. IEUA will continue to keep electrical contractor contacts and qualifications up to date to reduce downtime and potential for Facility upsets.

Mitigation Measure for Impact 6: Increased Temperatures on Vegetation within Conservation Easement

CE Monitoring and Adaptive Management

Please reference Mitigation Measure 4.1

3.5 Wildfire Mitigation Measures

The following sections discuss the existing, planned or potential mitigation measures for Impact 7, as identified in Section 2.5.

Mitigation Measure for Impact 7: More Frequent Power Disruptions (PSPS)

Existing On-Site Power Generators

See Section 3.4, Mitigation Measure 6.4: Existing On-Site Power Generators

Mitigation Measures for Impact 8: Wildfire Impacts to Conservation Easement

CE Monitoring and Adaptive Management

Please reference Mitigation Measure 4.1

3.6 Greenhouse Gas Emissions Associated with IEUA Activities

IEUA is not subject to mandatory GHG emissions reporting, but has conducted GHG inventories on an annual basis for inclusion in the IEUA Energy Annual Report using The Climate Registry (TCR) protocol since 2014 (IEUA, 2019). IEUA's last CCAP is from 2019, while the most recent GHG inventory is for the 2022 calendar year. The CCAP is updated every five years, as represented by this current CCAP update. Accordingly, the next CCAP will be completed in 2024.

Special Provision 5.b, item (i) of the NPDES Permit stipulates that the CCAP cover:

Greenhouse gas emissions, directly and indirectly attributable to the Facilities operations and effluent discharge process

In compliance with 5.b (i), this section describes the direct and indirect GHG emissions attributable to the Facilities as defined in the NPDES Permit and encompassed by overall IEUA operations.

The effluent discharge process has associated energy emissions produced by the conveyance and treatment of water and solids from inflow to outflow locations. These emissions are included in this overall Facilities-level reporting in the form of electricity and natural gas-related emissions from the RPs and are not broken out separately in existing GHG reporting. Accordingly, this section provides a summary of total IEUA GHG emissions which include GHG emissions related to the Facilities and effluent discharge processes.

GHG emissions generated by IEUA are organized into four categories: **direct emissions, indirect emissions**, **digester gas emissions,** and **optional reported emissions.**

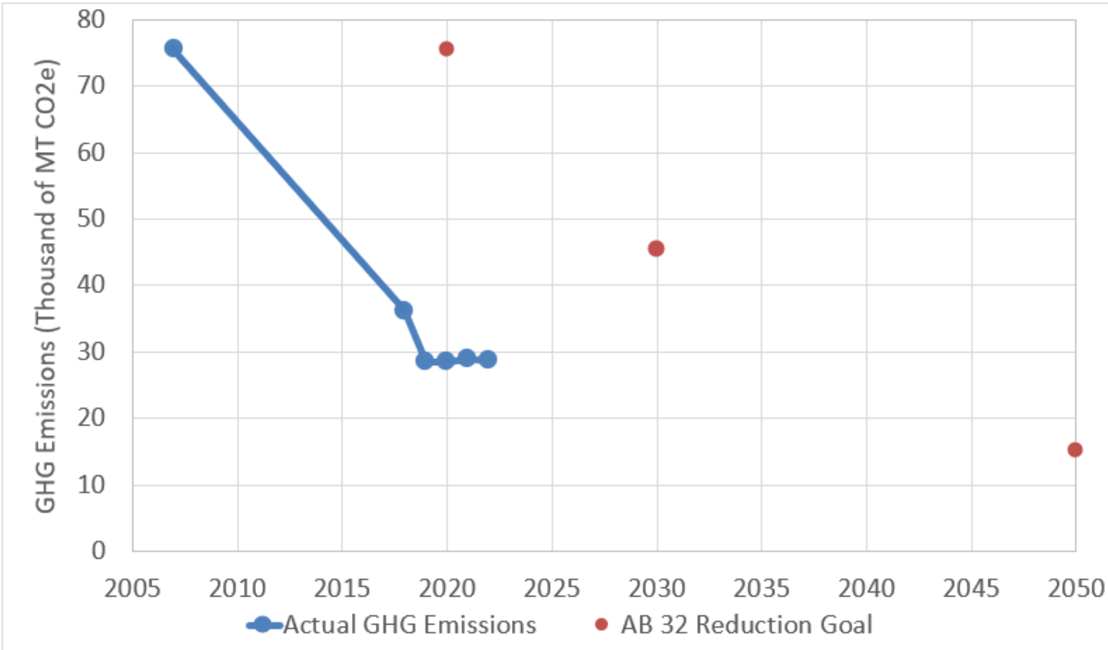
- **Direct emissions** are emissions from sources owned and controlled by the reporting entity (e.g., emissions from equipment operated within IEUA facilities).
- **Indirect emissions** are emissions associated with the activities of the reporting entity but occur at sources owned or controlled by another entity. For example, electricity purchased from SCE, or DA.
- **Digester gas emissions** are required to be reported, but are considered carbon neutral, as digester gas combustion emissions are emitted from biogenic sources (GHGs that were recently contained in living organisms). TCR requires the reporting of digester gas emissions but omits them from total achievement of GHG targets. (Climate Action Reserve 2007; IEUA 2019).
- **Optional reported emissions,** include indirect sources of mobile combustion.

IEUA GHG Emission Reporting History and Trends

IEUA has documented its internal emissions baseline since 2007. The 2007 GHG inventory serves as a proxy for setting a 1990 GHG emissions baseline, consistent with Assembly Bill 32 (AB 32, Global Warming Solutions Act of 2006) emissions reductions targets. AB 32 sets statewide goals to reduce emissions levels to 1990 levels by 2020, and 40 percent below 1990 levels by 2030 (IEUA 2019). The 2019 CCAP set a target for 80 percent GHG emission reduction by 2050 based on the 2007 baseline. Though the 2019 CCAP targets were consistent with the most recent climate legislation at the time, 2022 legislative updates will be considered in future target setting and GHG inventory documentation, as described in the sections below.

The most recent 2022 GHG inventory conducted internally using TCR protocols demonstrates the IEUA has already surpassed the AB 32 goal of 40 percent from reduction from 1990 (2007 as proxy year for IEUA) emissions levels by 2030 based on 2022 data, which was predominantly driven by the decommissioning of natural/digester gas fired cogeneration engines due to new air quality regulations. This trend is shown in Figure 16, as well as in the comparison of source emissions from IEUA's last CCAP as shown in Figure 17.

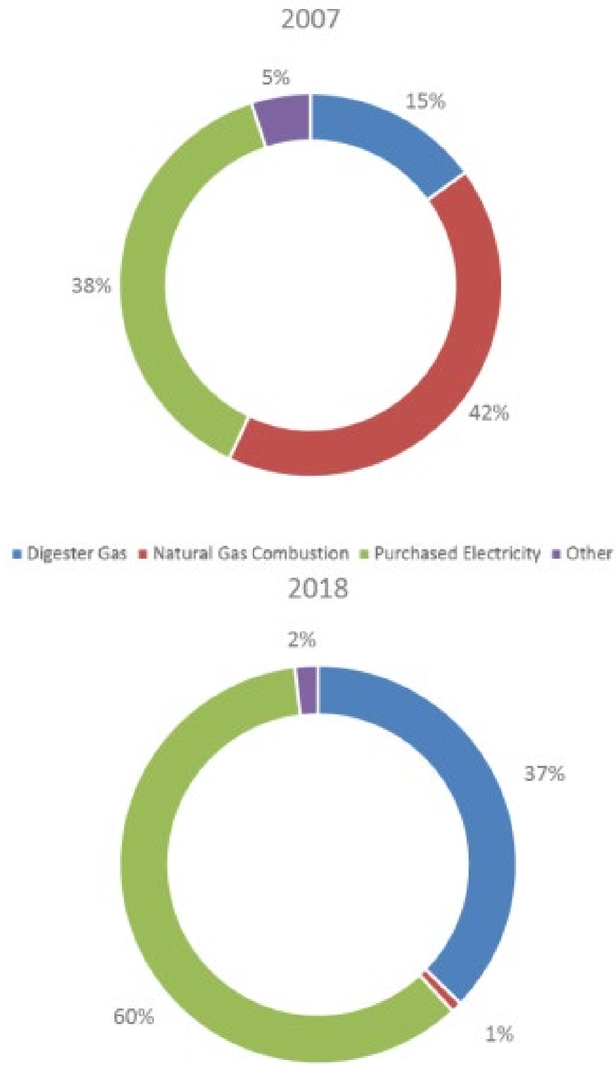
Figure 16 Overall IEUA Emissions: 2007-2022 (2022 GHG Inventory)



Source: IEUA, 2022 GHG Emissions (CCAP)

The 2019 IEUA CCAP documents a notable reduction in natural gas emissions from 42 percent in 2007, to 1 percent of total emissions in 2018. IEUA's most significant reduction of GHG emissions to date, and most significant proportional change in emissions sources, came from this reduction natural gas emissions. Digester gas emissions which are reported, but not included in overall achievement of GHG goals as they are considered carbon neutral, increased from 15 percent to 37 percent of total emissions during that same period, as shown in Figure 17.

Figure 17 Proportional Comparison of 2007 and 2019 IEUA GHG Emissions By Source (2019 CCAP)



Source: IEUA, 2019 (CCAP)

IEUA Total Emissions Overview (2022)

The majority of IEUA emissions (total, including NPDES Facilities) from direct sources are made up of stationary combustion of natural gas from IEUA facility flares, boilers, and engines , comprising 39% of the total, and 97.7% of all direct emissions. Indirect emissions, which are 99.3% comprised of emissions from electricity purchased from SCE/DA comprise 57% of IEUA emissions, as characterized in Table 4 and Table 5. Emissions totals also include carbon neutral digester gas emissions. These emissions totals reference IEUA's most recent 2022 GHG Inventory as referenced in the FY2023 Energy Report.

Table 4 Total IEUA Emissions by Source Type (2022)

Emissions Source	MT CO_2e	% of Total
Direct Emissions	11,940.6	41.6%
Indirect Emissions	16,561.9	57.6%
Indirect Emissions (Optional Reporting)*	119.5	0.4%
Total	**28,736.1**	**100.0%**

MT CO_2e: metric tons of carbon dioxide equivalent

* Biosolids hauling

Note: Totals may not add up due to rounding

Table 5 Direct and Indirect Emissions Sources (2022)

Description	MT CO_2e*	% Total
Direct- diesel (vehicles/port equip)	60.4	0.2%
Direct- gasoline (vehicles/port equip)	214.4	0.7%
Indirect- biosolid hauling (vehicles) [optional reporting]	119.5	0.4%
Direct-, diesel (generators)	85.1	0.3%
Direct- propane (flare)	34.0	0.1%
Direct- digester gas (flares, boilers, engines)*	11,168.7	39.0%
Direct- natural gas	378.0	1.3%
Indirect- purchased electricity	16,561.9	57.9%

* Digester gas is considered carbon neutral

MT CO_2e: metric tons of carbon dioxide equivalent

Direct and indirect emissions are further described in Table 6 and Table 7. Emissions from purchased SCE/DA electricity are the largest source of potentially mitigatable GHG emissions, while direct combustion from digester gas (which is considered carbon neutral), is the largest source of remaining GHG emissions that likely cannot be reduced through future GHG emissions reduction activities (CARB 2022).

Table 6 2022 Indirect Emissions Sources Description**

Emissions Source	MT CO_2e	% of Total Indirect
Indirect- Purchased electricity	16,561.9	99.3%
Indirect- biosolid hauling (vehicles) [optional reporting]	119.5	0.7%
Total Indirect Emissions	**16,681.5**	**100.0%**

Table 7 2022 Direct Emissions Sources Description

Emissions Source	MT CO_2e	% of Total Direct
Direct- diesel (vehicles/port equip)	60.4	0.5%
Direct- gasoline (vehicles/port equip)	214.4	1.8%
Direct- diesel (generators)	85.1	0.7%
Direct- propane (flare)	34.0	0.3%
Direct- digester gas (flares, boilers, engines)*	11,168.7	93.5%
Direct- natural gas	378.0	1.3%
Total Direct Emissions	**11,972.9**	**100.0%**

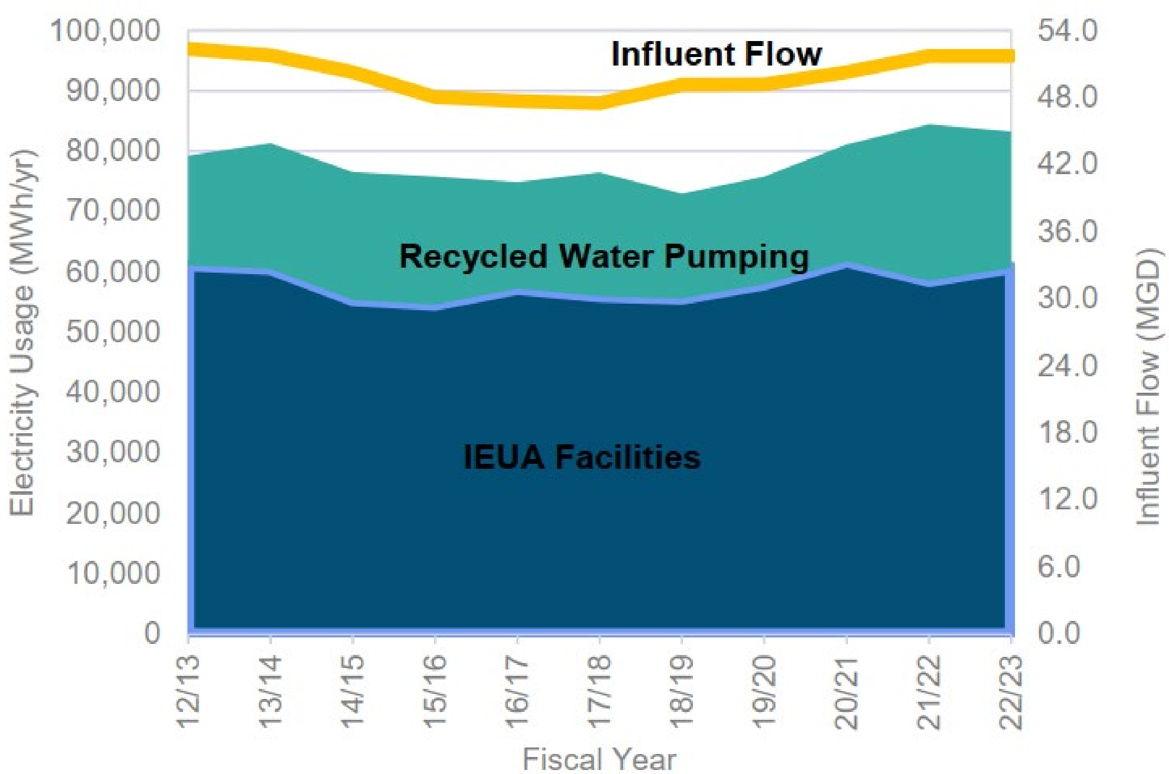
MT CO_2e: metric tons of carbon dioxide equivalent

* Digester gas is considered carbon neutral

**Note: Totals may not add up due to rounding; MT CO_2e = metric tons of carbon dioxide equivalent

Figure 18 further describes indirect emissions as classified in Table 6, showing total electricity usage from IEUA facilities vs. recycled water pumping for the 2022-2023 Fiscal Year (IEUA 2023).

Figure 18 Total 2022-2023 Electricity Use and Regional Influent Flows



Source: IEUA, 2023 (2022-2023 Energy Report)

Future GHG Emissions

Under Senate Bill 100, electricity generated and purchased by California power utilities, including SCE, must be carbon free by 2045. Current sources of emissions from purchased SCE electricity procured by IEUA will be carbon-neutral within the same timeframe. The current Power Content Label for the SCE Power Mix was 590 pounds CO_2e/MWh in 2023 (SCE 2023). The SCE emissions factor is expected to decline over time, reaching 0 MT CO_2e/MWh by 2045. As a result, electricity purchased by the IEUA will be zero-emission in this timeframe (California Energy Commission 2022). However, SCE currently has an opt-in Green Rate program that provides customers with 100% carbon-free electricity (SCE 2023).

IEUA historically has procured DA electricity for RP-1, RP-2, and CCWRF from Shell Energy North America, via a Master Energy Sales Agreement (MESA). The MESA was extended for another 2 years in June 2023. The 2021-2022 Energy Report stated in January 2022, staff enrolled 33 eligible accounts in the Green Rate program (IEUA 2022a). As of now, the Green Rate is not available for larger accounts, including larger industrial-scale accounts used by the RPs, though the availability of green rate accounts will continue to be monitored by IEUA staff.

Suggested Future Target & Strategy Updates Based on Recent Climate Legislation

Assembly Bill 1279 (AB 1279, California Climate Crisis Act), which was signed in September 2022, updates AB 32 by codifying the statewide carbon neutrality goal. AB 1279 established a clear, legally binding goal for California to achieve carbon neutrality no later than 2045, which is defined as an 85% reduction in emissions from 1990 levels.

The CARB 2022 Scoping Plan (December 2022) outlines the path forward to achieve the carbon neutrality goals codified under AB 1279. CARB considers wastewater treatment to have minimal feasible strategies to reduce GHG (methane) emissions. In fact, anaerobic digester technologies, like the kind employed by IEUA, are viewed as a GHG mitigation strategy, especially if paired with organic waste diversion activities.[7] Though relevant to IEUA's overall GHG emissions reductions, these CARB 2022 scoping plan directions are not relevant to the Facility operations and effluent discharge covered under the NPDES permit as they do not pertain to RP-specific GHG emissions from natural gas or purchased electricity.

IEUA Facility GHG Emissions Reduction Actions (Existing & Planned)

The 2019 CCAP and Fiscal Year 2022-2023 Energy Annual Report outline progress made towards GHG reduction in the CCAP reporting years between 2019 and 2022. New projects based on the previous 2019 CCAP analysis of proposed GHG mitigation measures, with progress updates as of August 2023, are represented in Table 8.

[7] Under 'Strategies for Achieving Success' under 'Landfill Methane' in the 2022 Scoping Plan, CARB articulates: "Utilize existing digesters at wastewater treatment facilities to rapidly expand food waste digestion capacity" as a methane reduction strategy to achieving Scoping Plan goals (CARB 2022).

Table 8 2019 CCAP Proposed GHG Reduction Mechanisms & Progress (August 2023)

Description (2019 CCAP)	Estimated GHG Reduction (MT CO_2 e)	Implementation Details (Feasible Start Date & Progress Made)
1. Replacement of existing 3.5 MW SunPower solar across four facilities. Current 20-year Power Purchase Agreement will end in 2028, and the panels will be replaced with higher efficiency units under a new 20-year Power Purchase Agreement	490	Feasible start date - 2029 when current Power Purchase Agreement will expire – no change made since 2019 CCAP
2. Operation of 1.5 MW AMS solar at Inland Empire Regional Composting Facility (IERCF) started in 2019. Current 20-year energy management service agreement (EMSA) will end in 2039, and the panels will be replaced with higher efficiency units	1,581	2039 when current ESMA will expire – no change made since 2019 CCAP
3. Addition of 70 kW of solar panels on the rooftop of the Water Quality Lab completed in 2018 and will start operation in 2020.	61	Project Completed in 2020
4. Addition of carport solar panels under a new Power Purchase Agreement	563	2030 - IEUA internally deciding whether or not to pursue
5. Addition of a solar panel to cover RP-1 Lagoon Number 3 under a new Power Purchase Agreement	1,181	2030 - IEUA internally deciding whether or not to pursue
6. In conduit turbine that converts previously wasted vented pressure into zero-carbon energy	364	2021- Project not implemented; determined to be not feasible
7. Utilize existing renewable methane at RP-1 to cogenerate heat and power through engines microturbine or fuel cell	12,900	2022 in 2019 CCAP; Start date shifted to 2026 in August 2023 CCAP Update
8. Combination of many individual upgrades to the various plants, including blower and pump replacement rehab and the addition of evaporative coolers	3,695	Ongoing- Additional energy efficiency projects have been completed as described below this table, reducing 1,304 tons of CO_2 annually
9. Replace current fleet with EVs, including on site charging infrastructure	274	2022-2030, depending on release date of specialty and medium/heavy-duty EVs– RP1 was approved for install of EV chargers (34 ports) through the SCE Charge Ready Program, project in process
Completed projects GHG reduction (3 & 8 (partial))	**1,365**	
Future GHG reductions from planned projects (1; 2; 4; 5; 7; 8 (partial); 9	**19,380**	

Source: 2019 CCAP Figure 9: IEUA Potential Project List

Three energy efficiency projects at pumps (relevant to NPDES Facilities, one of which is at RP-1, and the other of which is at RP-4) have been completed between the 2019 CCAP and the 2022 CCAP, saving a cumulative of 1,844,696.8 kWh/year, which translates to 1,304 MT CO_2e of annual GHG savings, according to IEUA internal calculations provided in August 2023.[8]

FY 2022-2023 Energy Report GHG Mitigation Measures Summary

The Energy Report for IEUA documents GHG emissions reductions achieved through energy management (including energy efficiency, renewables) every fiscal year. This documentation

[8] https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references; Internal IEUA Calculations

compliments the proposed mitigation projects from the 2019 CCAP in Table 8, which has been updated with progress updates as of August 2023.

Energy Efficiency Projects

Since 2015, IEUA has partnered with the Southern California Regional Energy Network (SoCalREN) to conduct comprehensive energy audits and reduce electricity consumption and demand. IEUA has avoided 558 kW of power usage cumulatively since the launch of the partnership.

Replacement of aeration blowers with energy efficient blowers at RP-4 were installed in November 2022. Replacement of aeration blowers at CCWRF are expected to be completed in August of 2024, saving 1,271 MWh annually. CCWRF planned projects to replace the existing odor control system with high-efficiency bio trickling filters is set to be completed by April 2025, resulting in energy savings of 247 MWh/year. Automated ammonia controls at RP-4 are currently in the commissioning phase, and CCWRF ammonia controls are expected to be installed by September 2024. These projects are expected to result in an estimated energy savings of 657 MWh/year.

Renewable Energy & Storage Projects

IEUA has a diverse energy production and storage portfolio; which accounted for 9% of the energy used in 2022-2023. IEUA's renewable energy portfolio consists of 5.0 MW of solar, 1.0 MW wind, 3.0 MW of engines, and 4.0 MW of battery storage as shown in Figure 19.

Figure 19 IEUA's Renewable Portfolio

Source: IEUA, 2023 (2022-2023 Energy Report)

Upcoming Projects

Per the 2022-2023 Energy Report, potential projects not included in Table 11 or the Energy Efficiency section include:

- Solar: evaluated feasibility for a remote solar and battery storage system through a public-private partnership to generate bill credits through the Renewable Energy Self-Generation Bill

Credit Transfer (RES-BCT) program in FY 22-23. The proposed project location was outside of IEUA service area, therefore ineligible for RES-BCT per SCE. Staff will re-evaluate a future project if the new location is within the IEUA territory.

- Hydropower: feasibility study conducted in FY 19-20 to be re-evaluated at a future unspecified date
- Biogas: Updating the RP-1 Beneficial Use of Biogas Feasibility Study
- Fleet Electrification Master Plan: Preparation of the Fleet Electrification Master Plan to comply with CARB's Advanced Clean Fleet Rule
- SCE Charge Ready 2 Program: design, construction, and install of electric vehicle (EV) charging infrastructure at no cost to IEUA.

Future GHG Mitigation and Reporting Measures

Future GHG mitigation and reporting actions will need to update IEUA GHG reduction targets to reflect recent climate change legislation, and link climate resiliency with GHG mitigation opportunities, while capitalizing on significant areas to further reduce GHG emissions not already targeted by IEUA.

Mitigation Measure 9.1: Consider adjusting GHG reduction target to support State decarbonization goals

2019 CCAP targets, and annual GHG reporting uses a baseline based on AB 32 2050 targets. IEUA will consider adjusting the baseline for future climate action plans (in an expected 2024-25 timeframe) with adjusted future GHG emissions inventories, target tracking, and updated mitigation measures to reflect the new AB 1279 target.

Mitigation Measure 9.2: Include GHG emissions reduction measure status in annual energy reports to track GHG emission progress

Track progress in reducing GHG emissions by continuing to track the implementation progress and resulting GHG emissions reductions from future GHG reduction projects in Table 11. This will provide an adaptive management tool to consistently track IEUA progress towards GHG emission reductions.

Mitigation Measure 9.3: Evaluate microgrid (battery storage + renewable energy) project feasibility

Evaluate microgrid projects feasibility, like the combined battery and renewable energy generation installation at IERCF and at IEUA Water Recycling Facilities. Microgrid may reduce the amount of diesel procurement for backup power through zero-carbon backup generation. This may also increase climate resiliency during potential power outages due to extreme heat or wildfire.

4 Order Adjustment

Based on the analysis presented in Section 2 and the existing steps taken by the IEUA to address potential impacts of climate change presented in Section 3, there are no requested adjustments to the Order at this time.

5 Financing

No planned steps to address potential climate risks to the IEUA Facilities have been identified requiring financing at this time. If additional steps are identified in the future, then additional financing may be necessary and will be planned for and secured as needed.

6 Conformity with other Agency Plans and Requirements

The NPDES permit states this CCAP shall identify conformity with other plans and requirements by other agencies including but not limited to CARB, and the Air Pollution Control District (SCAQMD). Each of the subsections below describe conformity with agency plans and requirements that directly relate to the IEUA mitigation and adaptation measures.

California Air Resources Board (CARB)

CARB is responsible for the regulation of mobile emissions sources in the state. CARB is responsible for monitoring the direct emission of seven GHGs: CO_2, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, nitrogen trifluoride, and sulfur hexafluoride.

Emissions of CARB-regulated mobile emission sources from IEUA Facilities are both from direct, and indirect sources of emissions, as the IEUA combusts natural gas and biogas on-site to heat the digesters and to power facilities, in addition to electricity purchased from SCE. CARB is generally responsible for monitoring and regulating GHG emissions (i.e., CO_2, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, nitrogen trifluoride, and sulfur hexafluoride) that IEUA operations emit (CARB 2022). The Advanced Clean Fleets (ACF) Regulation is CARB's most recent development in regulating these mobile sources of emissions by requiring phased fleet electrification standards starting in 2024. ACF applies to IEUA's fleets, as the ACF applies to State, local, and federal agencies. The ACF, and IEUA's actions to plan for future compliance are described below (CARB 2023).

However, the IEUA is not considered a Covered Entity under the Regulation as water and wastewater treatment does not fall under a sector identified by **Subarticle 7** (Cap and Trade) of the Regulations. Section 95852.2 (Emissions without a Compliance Obligation) includes biomethane and biogas from wastewater treatment plants. As IEUA is not a public utility gas or electric corporation, it is not considered a 'Covered Entity' under Section 95811, despite having on-site electricity generation and stationary combustion. Accordingly, the IEUA Facilities are not required to submit yearly GHG reporting to the CARB under the Mandatory Reporting Regulation or participate in the CARB-administered Compliance Offset Program under the California Cap-and-Trade Program (CARB 2021).

Instead, IEUA GHG mitigation measures are voluntary, and consistent with the NPDES permit section 5.b.(i). The IEUA does not purchase or sell carbon on the CARB-administered compliance market for carbon offsets, and is thus not regulated by CARB. IEUA also does not sell any offsets (e.g., Climate Action Reserve Tonnes) on the voluntary market, and is thus not subject to regulations by the SCAQMD SoCal Climate Solutions Exchange, which is described below.

Because of these conditions, the IEUA Facilities and operations do not require oversight and compliance with the CARB regulations described above.

IEUA is currently preparing a Fleet Electrification Master Plan to comply with the ACF. Starting in 2024, IEUA is required to ensure that 50% of medium-and heavy-duty vehicles purchased are zero-emission starting in 2024, and 100% of medium-and heavy-duty vehicles purchased are zero-emission by 2027. The Fleet Electrification Master Plan will allow IEUA to determine the most feasible pathway to electrify its fleet, which includes the installation of electric vehicle charging stations. The plan is expected to be completed by late 2023 (IEUA 2023, CARB 2023).

Air Pollution Control District (SCAQMD): Regulation XXVII- Climate Change

The SCAQMD regulates air quality in the IEUA service area, facilitating compliance with the federal Clean Air Act, as well as the state air quality program. For the last two decades, the SCAQMD has also included GHG reduction programs as part of its efforts to reduce local air pollution.

Regulation XXVII- Climate Change (Amended June 4, 2010) defines GHG emissions and reductions under Rule 2700 'General'. Regulation XXVII Rule 2701 defines the purpose and rules for the SoCal Climate Solutions Exchange, which is a voluntary, high quality certified GHG emission reduction program. Regulation XXVII Rule 2702 defines the Greenhouse Gas Reduction Program participation rules.

As the IEUA has not participated in the SoCal Climate Solutions Exchange, or the Greenhouse Gas Reduction Program as part of its GHG mitigation work, SCAQMD Regulation XXVII does not pertain to GHG reduction activities at the IEUA. Thus, the IEUA's GHG reduction activities are not regulated by SCAQMD.

7 Schedule to Update the CCAP

The schedule for updating the CCAP can be informed by the following factors:

- **Updated Climate Data:** Senate Bill 1320 calls on the State to develop California Climate Change Assessments at least every five years. Previous Assessments were released in 2006, 2009, 2012, and 2018. Revised climate scenarios are expected in 2023 and synthesis reports by 2026.
- **New Water Discharge Requirement Orders**: The current Order (R9-2022-0041) became effective on August 1, 2022, and expires on September 30, 2027.

In conclusion, within the effective period of the next order using data from California's Fifth Climate Change Assessment presents the most reasonable timeframe for updating the CCAP.

8 Other Factors

There are no other factors to present.

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