Attachment 1

SAN ELIJO | JOINT POWERS AUTHORITY

# CLIMATE CHANGE ACTION PLAN

MAY 2021

# CLIMATE CHANGE ACTION PLAN

San Elijo Joint Powers Authority

**SUBMITTED IN COMPLIANCE WITH:**
**SPECIAL STUDIES REQUIREMENT VI.A OF THE**
**MONITORING AND REPORTING PROGRAM FOR**
**ORDER NO. R9-2018-0003 (NPDES CA0107999)**

May 18, 2021

SAN ELIJO | JOINT POWERS AUTHORITY

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# *List of Abbreviations*

| | |
|---|---|
| AFV | alternative fueled vehicles |
| BOD | biochemical oxygen demand |
| CCAP | Climate Change Action Plan (required by the RWQCB Order No. R9-2018-0003) |
| $CO_2$ | carbon dioxide |
| $CO_2e$ | carbon dioxide equivalents |
| °F | degrees Fahrenheit |
| gpcd | gallons per capita per day |
| GHG | greenhouse gas |
| I&I | inflow and infiltration |
| IPCC | Intergovernmental Panel on Climate Change |
| kWh | kilowatt hours |
| mgd | million gallons per day |
| NOAA | National Oceanographic and Atmospheric Administration |
| NPDES | National Pollutant Discharge Elimination System (discharge permit) |
| OPC | California Ocean Protection Council |
| OPC-SAT | California Ocean Protection Council - Science Advisory Team |
| RSFCSD | Rancho Santa Fe Community Services District |
| RWQCB | California Regional Water Quality Control Board, San Diego Region |
| SCADA | supervisory control and data acquisition |
| SEJPA | San Elijo Joint Powers Authority |
| SEOO | San Elijo Ocean Outfall |
| SEWC | San Elijo Water Campus (formerly known as the San Elijo Water Reclamation Facility) |
| SEWRF | San Elijo Water Reclamation Facility (now known as the San Elijo Water Campus) |
| SLR | sea level rise |
| SSMP | Sewer System Management Plan |
| SSO | sanitary sewer overflow |
| SWRCB | State Water Resources Control Board |
| TSS | total suspended solids |
| USBR | U.S. Bureau of Reclamation |
| USGS | U.S. Geological Survey |
| ZEV | zero emission vehicle |

# "Protecting the Environment and Public Health is our Mission"

We are pleased to present San Elijo Joint Powers Authority's (SEJPA) Climate Change Action Plan (CCAP). SEJPA continues to advance its mission to provide safe and reliable wastewater and recycled water services in order to protect the environment and public health. For more than 50 years, we have served our community by protecting the water environment through the investment in efficient operations, treatment technologies, and our technical staff. Over time, SEJPA has embraced progressive approaches to wastewater, recycled water, and stormwater. We are led by our commitment to provide sustainable solutions for resilient communities. The CCAP will serve as an overarching guide that leads to continual improvement and advancements in greenhouse gas (GHG) reduction and climate change adaptation.

## PREPARING FOR CLIMATE CHANGE IMPACTS

Climate change is a global issue that is projected to have significant effects to our region. If no actions are taken, climate change-related impacts will include: increased temperatures and increased frequency of extreme heat events; increased potential for precipitation-driven flooding; changes to water supply availability; increased rate of wildfires; and rising sea levels. The CCAP addresses these impacts and identifies goals and strategies for implementing sustainable practices for GHG reduction.

## ESTABLISHING CCAP GOALS

SEJPA's facilities and capital planning are consistent and supportive with the GHG reduction goals established by the communities we serve (cities of Del Mar, Encinitas, and Solana Beach). Together, we can achieve widespread CCAP benefits by investing in energy efficiency, developing renewable local resources such as energy and water, supporting walkable and bikeable communities, and incorporating CCAP considerations in future operations and capital projects.

Guided by this CCAP, we will continue to deliver excellent service, while maximizing opportunities to reduce GHG's and increase local sustainability.

Respectfully,

Michael T. Thornton, P.E.
General Manager

**SEJPA's recent energy efficiency and optimization investments and actions include:**

- Treatment Optimization Improvements
- Centrifugal Blower Replacement
- SEOO Land Outfall Replacement *(Protecting against potential increased erosive effects associated with climate change)*
- Recycled Water Improvements *(Enhanced treatment processes improve efficiency and allow for offset of potable water)*
- Water Campus Improvements Project – PV Solar System *(Construction is underway on site upgrades that include renewable energy production and features that meet CCAP measures)*

## CCAP BENEFITS:

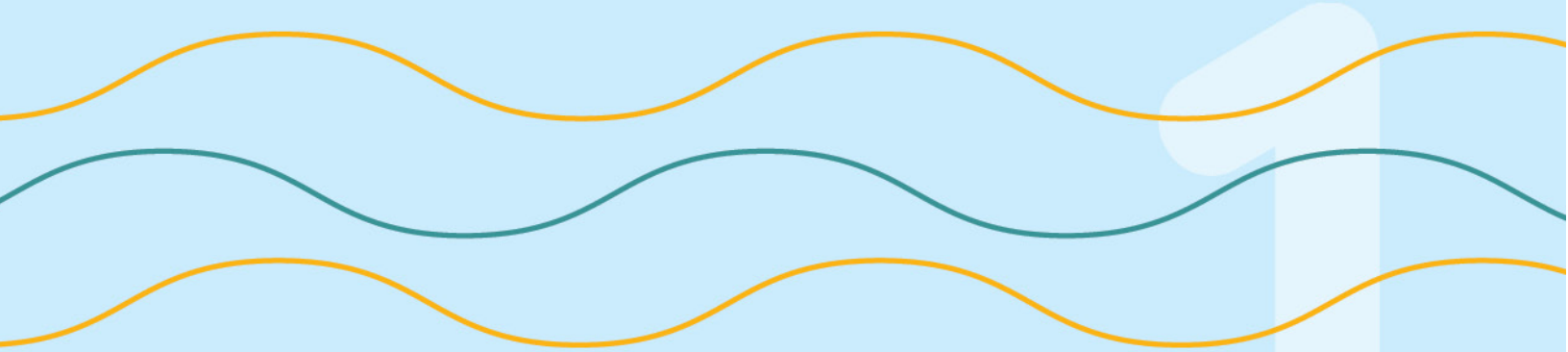
**ENVIRONMENT**

**PUBLIC HEALTH**

**RESOURCE EFFICIENCY**

CHAPTER 1

# INTRODUCTION



# *Chapter 1*

# *INTRODUCTION*

## 1.1 Purpose of Climate Change Action Plan (CCAP)

The San Elijo Joint Powers Authority (SEJPA) seeks to develop its CCAP as a communication tool with its elected Board of Directors, the communities and local government agencies it serves, and the regulatory community.

The CCAP is consistent with and meets the objectives of Regional Water Quality Control Board (RWQCB) Order No. R9-2018-0003 (NPDES CA0107999) that regulates the treatment of wastewater at San Elijo Water Campus or SEWC (formerly known as the San Elijo Water Reclamation Facility) and the discharge of treated SEWC wastewater to the Pacific Ocean via the San Elijo Ocean Outfall (SEOO).

The CCAP provides the following:

- identify projected impacts on SEJPA facilities if current climate change trends continue,
- identify steps taken or planned to address greenhouse gas (GHG) emissions associated with wastewater treatment and disposal, and
- identify steps being taken or planned to address:
    - climate-related changes in flooding or rises in sea levels,
    - potential changes related to volatile rain periods (both wet and dry),[1]
    - potential climate-related changes in wastewater flows (both high and low flows),
    - potential changes in process design parameters due to climate-related changes in influent characteristics, including biochemical oxygen demand (BOD), ammonia, and total suspended solids (TSS),
    - potential climate-related changes on wastewater treatment operations and effluent quality,
    - the potential need to adjust NPDES permit conditions and wastewater operations,
    - the financing needs to pay for planned climate-related actions,
    - schedules to update the CCAP as more data become available, and
    - any other factors of relevance to climate change.

1 Volatile rain periods, as addressed within Order No. R9-2018-0003 include climate-related changes in the frequency, duration, and intensity of precipitation events.

The RWQCB has established identical CCAP requirements on all other San Diego Region ocean outfall NPDES permits that have been issued since 2017, including the City of Escondido which also discharges to the SEOO.[2]

**Purpose and Scope of CCAP.** The CCAP is intended to provide guidance and transparency to the SEJPA's strategy for planning and adapting to climate change. The CCAP is submitted in compliance with Special Studies Requirement VI.A of RWQCB Order No. R9-2018-0003. To address the requirements of Order No. R9-2018-0003, the CCAP summarizes:

- projected climate change effects and the impact of projected climate change on SEJPA and tributary wastewater facilities if current climate change trends continue (Chapter 2),
- ongoing activities of SEJPA, SEJPA member agencies, and other agencies contributing flows to the SEWC to address GHG emissions, identify GHG reduction goals, and achieve the GHG reduction goals (Chapter 3),
- steps being taken or planned to be taken to address projected climate change effects on SEJPA facilities and operations and tributary wastewater facilities and operations (Chapter 4), and
- the process and schedule for updating the CCAP and support studies, financing issues, and any required climate-related NPDES permit revisions (Chapter 5).

**The CCAP aligns with SEJPA's CIP, which includes elements that help SEJPA achieve improved energy efficienty, reduce GHG emissions, improve water quality, or enhance regional water supplies.**

While the CCAP addresses climate-related issues associated with SEJPA treatment and discharge facilities, the SEJPA CCAP also summarizes actions of agencies who maintain wastewater collection systems that contribute flow to the SEWC.[3] These agencies include:

- the City of Encinitas and the City of Solana Beach (SEJPA member agencies),
- the City of Del Mar, which directs its municipal wastewater flow to the SEWC for treatment, and
- and Rancho Santa Fe Community Services District (RSFCSD), which serves unincorporated areas within the County of San Diego that are tributary to the SEWC.[4]

2 CCAP requirements have been established by the RWQCB for the City of San Diego (Order No. R9-2017-0007) City of Escondido (Order No. R9-2018-0002), Encina Wastewater Authority (Order No. R9-2018-0058), City of Oceanside (Order No. R9-2019-0166), U.S. Marine Corps Base Camp Pendleton (Order No. R9-2019-0167) and Fallbrook Sanitary District (Order No. R9-2019-0169).

3 RWQCB Order No. R9-2018-0003 establishes requirements for SEJPA wastewater treatment and discharge facilities and operations. Wastewater collection systems owned and operated by SEJPA member agencies (City of Encinitas and City of Solana Beach) and by wastewater agencies that contribute flows to the SEWC (City of Del Mar and County of San Diego) are regulated through requirements established by the State Water Resources Control Board (SWRCB) within Orders No. 2006-0003-DWQ and Order No. 2013-0058-EXEC. The SWRCB Orders establish state-wide discharge requirements for sanitary sewer collection systems and require each enrolling agency to develop, maintain and update Sewer System Management Plans (SSMPs). SSMPs are required to include an operation and maintenance plan, design and performance provisions, system evaluation and capacity assurance provisions, and a monitoring program for assessing sanitary sewer overflows (SSOs). While climate-change effects are not explicitly addressed in the SWRCB Orders, requirements governing the prevention of SSOs implicitly require that capacity and planning analyses take into account anticipated future conditions, including climate change.

4 The SEWC receives inflow from the City of Del Mar and from a portion of the RSFCSD (which serves unincorporated areas within the County of San Diego) through interagency agreements with SEJPA.

**Applicable Climate Action Plans.** Climate Action Plans that have been adopted and implemented by SEJPA member agencies include:

- *City of Encinitas Final Climate Action Plan* (City of Encinitas, January 2018 and Interim Revision, November 2020), and
- *City of Solana Beach, Final Climate Action Plan* (City of Solana Beach; July 2017, February 2020).

Other adopted climate action plans applicable to the SEWC service area include:

- *Del Mar Climate Action Plan* (City of Del Mar, June 2016) and
- County of San Diego Climate Action Plan (County of San Diego, February 2018).

Each of the agency's adopted climate action plans presents:

- a summary of projected climate-change issues and probable effects,
- an inventory of GHG emissions,
- GHG reduction strategies,
- vulnerability assessment, resiliency and adaptation plans,
- implementation and monitoring provisions, and
- procedures and schedules for updating the climate action plans.

To varying degrees, each of the adopted climate action plans addressed wastewater operations and facilities.

## 1.2 Preparation of CCAP

This CCAP was prepared by SEJPA under the direction of Mr. Christopher Trees, SEJPA Director of Operations. While this CCAP has been prepared by SEJPA, the SEJPA CCAP is consistent with climate change plans and goals adopted both by SEJPA member agencies and by other agencies that contribute wastewater flows to the SEWC.

As described herein, future updates to the SEJPA CCAP will be periodically prepared and submitted to the RWQCB as required to address updated wastewater facilities plans and updated climate-change effects or projections. Questions or comments concerning this CCAP should be directed to:

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CHAPTER 2

# PROJECTED CLIMATE CHANGE EFFECTS

# *Chapter 2*

# *PROJECTED CLIMATE CHANGE EFFECTS*

## 2.1 Summary of Climate Change Projections

**Basis of Projections.** This section identifies potential climate change-related impacts to SEJPA and tributary area facilities and operations if current trends continue. It is acknowledged that future revision of these projections will be warranted as additional climate change data are developed.

*State and Regional Climate Projections.* A number of state and regional climate change reports and studies have been released that have assessed climate change in San Diego County. In 2018, the State of California issued *California's Fourth Climate Change Assessment*, which incorporated climate projections from 33 State-funded research projects and contributions from 11 external researchers.[5]

Increased atmospheric carbon dioxide ($CO_2$) concentration resulting from human activity is the overarching driver of the climate change effects forecast within *California's Fourth Climate Assessment*. Table 2-1 summarizes general trends cited in *California's Fourth Climate Change Assessment* and the San Diego Region portion of the Fourth Climate Change Assessment.[6]

Table 2-1
Summary of Projected Climate Change Trends
California's Fourth Climate Change Assessment[6,7,7]

| Category | Trend | Scientific Confidence |
|---|---|---|
| Temperature | Warming | Very High |
| Sea Levels | Rising | Very High |
| Snowpack | Declining | Very High |
| Annual Precipitation | Unknown | Low |
| Intensity of Heavy Precipitation Events | Increasing | Medium High |
| Frequency of Drought | Increasing | Medium High |
| Acres Burned by Wildfires | Increasing | Medium High |

5 From Table 3-A of California's Fourth Climate Change Assessment, Statewide Summary Report. Source: State of California (2018a).

6 California's Fourth Climate Change Assessment, San Diego Region Report. State of California (2018b).

7 Table 3-A of California's Fourth Climate Change Assessment, Statewide Summary Report does not list ocean acidification, but other sections of the report identify a probable increasing trend in ocean acidification (decrease in pH). State of California (2018a).

*Agency Climate Change Reports.* Climate change trends projected for the San Diego Region within *California's Fourth Climate Change Assessment* are consistent with climate change projections addressed within the climate action plans adopted by agencies that contribute flow to the SEWC.[8] Key climate change effects addressed within the agency climate plans include:

- *Increased temperatures and increased frequency of extreme heat events.* Average temperatures will increase, hotter and drier days will become more frequent, and heat waves will become more frequent and more prolonged.
- *Reductions in fresh water.* Water and energy demand will increase while extended and more frequent droughts will likely decrease the availability of water from traditional imported water sources.
- *Increased potential for precipitation-driven flooding.* Climate change will result in a greater variation in precipitation, potentially resulting in increased frequency and duration of extreme precipitation events that can cause inland and coastal flooding.
- *Increased rate of wildfires.* Drier weather may increase the frequency and size of wildfires and extend the length of the wildfire season.
- *Rising sea levels.* Projected sea level rise, coastal erosion, and increasing storm surges may cause fragile sea cliffs to collapse, beaches to shrink, more frequent coastal flooding and increased erosion. These effects, in turn, may impact infrastructure and ecosystems.

In addition to the CO2-related effects addressed within *California's Fourth Climate Change Assessment* and the agency climate change reports, projected $CO_2$ emissions may trigger a gradual warming of ocean temperatures and trigger changes in ocean water chemistry.[9]

Of particular importance with respect to SEJPA and member agency wastewater facilities and operations are:

- projected increases in sea levels and associated coastal flooding and erosion, and
- potential climate-related effects on water supply availability.

**Temperature Variation.** As documented within California's Fourth Climate Change Assessment, the climate within San Diego County will become hotter and drier in the coming decades. By 2050, average annual air temperatures will increase by 2 to 3 degrees Fahrenheit (°F), and the temperature rises will be more significant during summer months.[10]

The pattern of projected temperature change is projected to vary between coastal and inland areas, with projected increased temperatures along the coast being less than projected temperature increases in

8 Includes the City of Encinitas Final Climate Action Plan (January 2018, Interim Revision November 2020), the City of Solana Beach Climate Action Plan (July 2017), the Del Mar Climate Action Plan (June 2016) and the County of San Diego Climate Action Plan (February 2018).

9 As stated on page E-27 of the Monitoring and Reporting Program of RWQCB Order No. R9-2018-0003.

10 Larger temperature increases are projected by the end of the 21st century, with San Diego Region temperature increases ranging from 4-6 °F under some climate modeling scenarios and up to 7-9 °F under more worst-case modeling scenarios. Source: California's Fourth Climate Change Assessment, San Diego Region Report (State of California, 2018b).

inland areas. By 2050, the amount of additional temperature increase in the interior regions of San Diego County is projected to exceed temperature increase along the coastal zone by 1 °F.[11]

Heat waves (periods of uncomfortably hot days and nights) will increase in frequency, duration, and magnitude. Demonstrating this, the 98th percentile heatwave that occurred during the period 1970-2000 (which typically occurs twice per year and lasts for two days), is projected to occur 12-16 times per year by 2050 and last for an average of four days.[12]

Ocean temperatures are also projected to rise. Fumo et al. (2020) document a 2 °F increase in ocean temperatures at the Scripps Pier in La Jolla during the past century. Fumo et al. (2020) also document that periods of elevated temperatures in marine waters (e.g., marine heat waves) have increased both in intensity and duration during the past century. As an example of these rising temperatures, the two warmest San Diego Region ocean temperatures on record occurred in August, 2020.[13]

**Reductions in Fresh Water Supplies.** *California's Fourth Climate Change Assessment* notes that climate change is projected to result in extended and more frequent droughts both in local watersheds and in watersheds which supply the region's two imported water supplies – the Colorado River and State Water Project. Additionally, climate change is projected to result in less snowpack in the watersheds that supply the Colorado River and State Water Project, resulting in shorter periods of seasonal runoff compared to historic conditions.[14] The change in runoff patterns, in turn, may also result in increased environmental restrictions which further limit the availability of imported supplies. Overall, the availability of imported supplies may shrink significantly by 2050. The U.S. Bureau of Reclamation *San Diego Watershed Basin Study* (USBR, 2016) projects that climate-related changes may decrease the availability of State Project Water supplies from 13 percent (hot wet conditions) to 27 percent (hot dry conditions) by 2050.[15] Even more significant climate-related decreases in Colorado River imported supplies are forecast.[16]

At the same time, the San Diego County Water Authority is projecting that, even with increased water conservation, increased population within the region will increase total annual Municipal and Industrial water demands from approximately 588,000 acre-feet per year in 2020 to 719,000 acre-feet per year in 2040.[17] Since water demands are projected to be above average during the drought periods that are projected with climate change, climate change is projected to result in increased need for the development of sustainable local water supplies.[18]

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11 See page 19 of California's Fourth Climate Change Assessment, San Diego Region Report (State of California, 2018b).

12 County of San Diego office of Emergency Services and San Diego County Unified Disaster Council (2017), pages 29-30.

13 The temperature at Scripps Pier on August 3, 2020 was 78.8 °F and the temperature was 78.6 °F on August 1, 2020. The prior warmest temperature occurred in July 1931. Source: Angela Fritz of the Washington Post (August 6, 2020).

14 Snowpack effectively stores water for subsequent release upon melting, resulting in runoff occurring during a longer portion of the year. This prolonged runoff effect allows for more effective use of storage reservoirs and imported water diversion and conveyance facilities.

15 See Section 4.2 (Table 10) of USBR (2016).

16 See Section 4.1 of USBR (2016).

17 San Diego County Water Authority (2015), page 2-7.

18 The San Diego County Water Authority (2015) superimposed a range of climate change estimates onto a regional water demand model, and concluded that the climate-related effect on projected demand was near negligible during wet years but that demands increased approximately 16 percent above normal during hotter and drier years. Estimated demands are in the process of being updated.

**Precipitation-Driven Flooding in Inland Areas.** Climate model results indicate that the San Diego Region will retain its Mediterranean pattern, with most precipitation occurring during winter months. While the models generally agree with respect to projected temperature increases, significant disagreement occurs among the models as to the effects of climate change on precipitation, with some models projecting increases in annual precipitation while other models project decreases in annual precipitation.[19]
Most models, however, project greater volatility in precipitation, with fewer days of precipitation, but more precipitation on the days that rain does occur.[20] If such effects occur, this could lead to an increased potential for precipitation-driven flooding in inland areas even if long-term average annual precipitation totals are not markedly affected by climate change.

**Wildfires.** While the potential economic impacts of wildfires are projected to be greater as the San Diego Region population increases, climate change is projected to potentially result in an increased frequency and magnitude of wildfires, due to:

- increased air temperatures and extended fire season,
- drier vegetation during periods of drought,
- denser vegetation during wetter than normal years, and
- possible increase in the duration of Santa Ana Winds, prolonging extreme fire conditions.[21]

Overall, the number of days each year with ideal conditions for large-scale wildfires is projected to significantly increase by 2050.[27]

**Sea Level Rise/Coastal Flooding.** Sea level rise and coastal flooding (and associated erosive effects) represents the greatest potential for climate-related impact to SEJPA facilities and operations. Over the past century, mean global sea level has risen approximately 0.07 inches per year, accelerating to a rate of approximately 0.13 inches per year since 1993.[22] Tide gauges in the region indicate a sea level rise of approximately about 0.09 inches per year during the past 100 years.[23] This sea level rise will result in increased coastal flooding, particularly during high tide and storm events. The sea level rise and coastal flooding will also result in increased erosion along coastal bluffs, cliffs and beaches.

Considerable research has been conducted to date to assess sea level rise projections in San Diego County. In 2018, the State of California provided a comprehensive update of sea level rise guidance in *State of California Sea Level Rise Guidance, 2018 Update* (California SLR Guidance).[24] Incorporating science from the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report[25] and the California Ocean Protection Council Science Advisory Team (OPC-SAT) Rising Seas Report[26], the California SLR

19 San Diego County Water Authority (2015), page 2-12. Also see USBR (2016).

20 California's Fourth Climate Change Assessment, San Diego Region Report (State of California, 2018b).

21 Source: State of California (2018b).

22 IPCC (2013).

23 NOAA (2018).

24 California Natural Resources Agency and California Ocean Protection Council (2018).

25 IPCC (2014).

26 OPC-SAT (2017).

Guidance addressed advances in sea-level rise modeling and improved understanding of the processes that drive global sea level rise. Key technical findings and recommendations presented within the California SLR Guidance, in part, include:

- Scientific understanding of sea-level rise is advancing at a rapid pace.
- The direction of sea-level change is clear; sea levels are rising.
- The rate of ice loss from the Greenland and Antarctic ice sheets is increasing, and California is particularly vulnerable to sea-level rise caused by ice loss from West Antarctica.
- New scientific evidence has highlighted the potential for extreme sea-level rise.
- Probabilistic model projections should be used to understand and address impacts and consequences associated with sea level rise.[27]

The 2018 California SLR Guidance and 2018 guidance issued by the California Coastal Commission[28] included sea level rise projections for the San Diego region based on probabilistic modeling presented by Kopp et al. (2014) and Sweet et al. (2017). Table 2-2 summarizes the sea level rise projections for the San Diego region, as per the 2018 California SLR Guidance and the 2018 California Coastal Commission guidance.[29]

Table 2-2
Projected Sea Level Rise in the San Diego Region, 2030-2050[30, 31]

| Risk Category | Description | Projected Sea Level Rise (feet) | | |
|---|---|---|---|---|
| | | 2030 | 2040 | 2050 |
| Low Risk Aversion[32] | 17% probability that sea level rise exceeds the listed value | 0.6 | 0.9 | 1.2 |
| Medium-High Risk Aversion[33] | 0.5% probability that sea level rise exceeds the listed value | 0.9 | 1.3 | 2.0 |
| Extreme Risk Aversion[33] | Single maximum occurrence (no assigned probability)[34] | 1.1 | 1.8 | 2.8 |

27 California Natural Resources Agency and California Ocean Protection Council (2018), pages 1-3 and 1-4.

28 California Coastal Commission (2018).

29 While Table 2-2 shows projected sea level rise through 2050 (an appropriate planning horizon for wastewater facilities planning), even greater increases in sea levels are projected in the latter half of the 21st century. Source: California Natural Resources Agency and California Ocean Protection Council (2018).

30 See Table 34 (page 78) from California Natural Resources Agency and California Ocean Protection Council (2018).

31 See Table G-12 (Appendix G, page 304) from California Coastal Commission (2018).

32 Sea level rise projections presented in the California SLR Guidance and California Coastal Commission Guidance is based on modeling projections presented by Kopp et al. (2014).

33 Sea level rise projections presented in the California SLR Guidance and the California Coastal Commission Guidance is based on modeling projections presented by Sweet et al. (2017).

34 The California SLR Guidance and Coastal Commission SLR Guidance notes that probabilistic projections may underestimate the likelihood of extreme sea-level rise resulting from loss of the West Antarctic ice sheet, particularly under high emissions scenarios. To address this, both guidance documents include an extreme scenario called the H++ scenario. The probability of this scenario is currently unknown, but its consideration is important, particularly for high-stakes, long-term decisions. The above-listed values for "extreme risk" are based on this H++ scenario.

In addition to the near-term projected rises in sea levels shown in Table 2-2, the rate of sea level rise in the second half of the 21st century could be significantly higher. By year 2100, sea levels may rise by approximately 2.4 to 5.9 feet, with the potential for an extreme scenario of 10.2 feet of rise.[35]

## 2.2 Potential Impacts on Wastewater Facilities

Based on the climate change projections presented in Section 2.1, this section identifies potential climate change-related impacts to SEJPA and member agency wastewater facilities and operations if no actions are taken.[36]

**Temperature Variation.** Projected increases in San Diego County air temperatures associated with climate change have the theoretical potential to result in:

- slight potential for increased temperatures in wastewater treatment plant influent,
- slight potential for effects on nitrification within recycled water treatment operations, and
- potential for increased power outages related to regional power use spikes during heat waves.

*Temperature Effects on Wastewater Treatment.* Temperature-related issues are not projected to represent a significant impact to SEWC treatment operations. While increased influent temperature could enhance microbiological reactions in the secondary treatment and reduce solids retention times, the slight potential increase in temperature in the SEWC influent is not projected to significantly affect overall wastewater treatment processes or operations. Further, the SEWC maintains standby power in the event of temperature-related regional power outages.

*Temperature Effects on Ocean Discharge Operations.* Slight increases in the temperature of the discharged effluent are likely to be offset by increased ocean temperatures, resulting in minimal impacts to outfall performance or initial dilution.

**Reductions in Fresh Water Supplies.** Actions during the past 30 years have significantly diversified water supply sources within the San Diego Region.[37] SEJPA's long-standing and ongoing actions to increase recycled water use are consistent with San Diego County Water Authority, local water districts, RWQCB, and member agency goals to develop sustainable local water supplies to help alleviate projected shortfalls in the future availability of imported water supplies.

35 California Natural Resources Agency and Ocean Protection Council (2018).

36 Potential climate-related impacts discussed herein are preliminary. Additional facility-specific assessments will be required to evaluate site-specific vulnerabilities of wastewater facilities.

37 In 1990, imported water from the Metropolitan Water District of Southern California (MWD) comprised more than 90 percent of the San Diego County water supply. In 2019, MWD imported water comprised only 29 percent of the region's water supply. Source: San Diego County Water Authority 2019 Annual Report.

**Precipitation-Driven Flooding in Inland Areas.** Per requirements in existing RWQCB and SWRCB discharge orders, all existing SEJPA treatment and disposal facilities have been designed to protect against the waters of a once-in-100-year flood event and once-in-100-year runoff event.[38]

Member agency wastewater collection facilities have been sited and designed to operate under extreme hydrologic conditions, including 100-year flood and runoff conditions. As additional climate change projections become available, it is projected that the County will, where applicable, develop revised 100-year flood maps. If and when such flood projections are revised, SEJPA and member agency planners will need to evaluate whether:

- existing and planned facilities may be affected by such revised flood plain delineations and, if so,
- what additional means of protection are required to address the potential for increased facilities vulnerability to future climate-related flood or runoff events.

**Wastewater Flows.** In addition to increasing flood and runoff vulnerability, increased precipitation (along with sea level rise and coastal flooding) may also affect sewer system inflow and infiltration (I&I). Key factors that may affect I&I include:

- *Increased Precipitation Intensity.* As noted, uncertainty exists as to whether or how climate change will affect overall San Diego Region precipitation patterns. Even if climate change does not impact long-term average annual precipitation totals, however, many climate change models indicate a potential for more varied and intense precipitation. This increased severity in storms may lead to increased sewer system I&I during such extreme wet periods.
- *Coastal Flooding*. In the absence of protective measures, projected sea level rise combined with high tide events or storm surges will result in an increased number of times coastal areas are inundated. SEWC wastewater inflows could potentially increase as a result of increased I&I during these coastal inundation events. Additionally, increases in climate-related I&I could result in increased TDS concentrations in the SEWC influent.[39]

The degree to which future I&I may be influenced by climate change is currently unknown. SEWC flow projections are periodically updated as part of ongoing master planning efforts, but trends in SEWC inflows in recent years has been downward due to water conservation efforts. SEJPA and its contributing agencies will continue to monitor wastewater flow in future years to determine if any climate-related trends in wastewater flows are evident.

**Wastewater Quality.** Water conservation efforts in recent years has led to a modest increase in SEWC influent concentrations of TSS and BOD. SEJPA will continue to monitors trends in SEWC influent quality, but climate change is not projected to discernibly impact the quality (or mass loads) of BOD and TSS in the SEWC influent.

38 All existing SEJPA facilities and tributary pumping stations have been designed to provide protection against present day and near-term 100-year flood and runoff events. Further site-specific study will be required to assess how long-term climate change conditions may alter future flood and runoff protection needs beyond 2050. Future update to the CCAP will address the results of these studies when available.

39 Additionally, if significant coastal I&I were to occur as a result of climate-related coastal flooding, this could lead to sudden increases in influent TDS at the SEWC which could potentially result in salinity-related toxic effects on the microbiology of SEWC secondary treatment processes.

As noted, climate-related coastal flooding could result in increased I&I, which in turn could result in increased TDS concentrations in the SEWC influent. If this were to occur, TDS concentrations in the SEWC recycled water could also increase, making the SEWC recycled water less desirable for irrigation. SEJPA, however, will be able to control TDS concentrations in the SEWC recycled water to a degree because of the reverse osmosis system that was installed in 2012.

**Wildfires.** Wildfires would have the potential to temporarily disrupt SEJPA wastewater treatment and collection operations only if the fires are immediately adjacent to and threatening to the facilities. Wildfires, however, may also affect:

- the regional transportation grid which in turn can potentially delay sewer and water response crews, and/or
- the regional power grid, which may result in increased reliance on back-up power sources at pump stations and treatment facilities.

**Sea Level Rise.** The sea level rise projections presented in Section 2.1 have the potential to affect SEJPA and member agency wastewater operations in several ways, including:

- potential sea level rise impacts (and or storm surge effects) on existing pumping stations and collection facilities that are located in low lying coastal areas,
- erosion impacts on existing wastewater pumping and collection facilities that are located in coastal areas, and
- increased I&I into coastal wastewater collection facilities, increasing peak flows at regional wastewater treatment facilities.

*Impacts to SEWC Treatment Facilities or Operations.* The SEWC site is located on elevated ground north of San Elijo Lagoon, and the site is not projected to be adversely affected by coastal flooding, sea level rise, or storm runoff. Additionally, improvements to the local storm channel facilities are being implemented as part of the SEJPA Water Campus Improvements Project.[40] As part of this project, the existing storm channel is being replaced by underground culverts and a segment of the North Coast Bike Trail is to be constructed along the culvert alignment.

Other than potential effects on I&I (see page 2-7) sea level rise is not projected at this time to result in any discernible impacts to SEWC treatment facilities or treatment operations.

*Impacts to Ocean Discharge Facilities and Operations.* In 2021, SEJPA completed a project to replace the land outfall section of the SEOO. The original land outfall was completed in 1965 and consisted of an asbestos-concrete pipe installed at a shallow depth. The replacement land outfall is constructed of high-density polyethylene pipe and was installed using directional drilling techniques at a depth of up to

40 In addition to storm runoff improvements, the project incorporates interactive educational features, a segment of the North Coast Bike Trail, solar energy production facilities, and additional parking for SEJPA, nature path and lagoon visitors. An aerial photo showing the new underground stormwater channel construction work immediately west of the SEWC is presented on the cover of this report. The Water Campus Improvements Project is scheduled to be completed by the end of 2021.

75 feet. The land outfall connects to the SEOO at San Elijo State Beach a depth approximately 15 feet below Mean Sea Level. Because of the depth of the land and ocean outfall, erosive and coastal flooding effects on the land and ocean outfall are projected to be negligible.

While projected increases in sea levels will slightly reduce the static head available for conveying wastewater through the outfall, this slight decrease in available head is not projected to significantly affect outfall operations. Projected sea level rise is also not projected to have a discernible effect on outfall capacity, as the existing capacity of the SEOO is limited by pressure ratings on the inshore portion of the 30-inch-diameter SEOO which would not be affected by a slight reduction in available static head.

*Agency Wastewater Collection Facilities.* While climate change effects are not projected to discernibly impact the SEWC and SEOO, climate change effects offer the potential for impacting wastewater collection facilities operated by SEJPA member agencies and other agencies that contribute flow to the SEWC.

Detailed climate change vulnerability assessments on specific wastewater collection facilities have not been completed, but preliminary assessments indicate the potential for long-term sea level rise to potentially affect low elevation coastal wastewater collection facilities and pump stations through coastal erosion and coastal flooding. The City of Encinitas, in collaboration with the San Diego Foundation and Local Governments for Sustainability is in the process of developing the San Diego Regional Coastal Resilience Assessment which will assess vulnerability of coastal assets (including wastewater facilities) using the U.S. Geological Survey (USGS) CoSMoS sea level model.[41] Similarly, the City of Solana Beach climate plan calls for conducting additional sea level rise studies to better understand the risks and develop long-term mitigation recommendations.[42]

In addition to assessing climate effects on sewer mains, the vulnerability assessments will evaluate potential climate-related effects on wastewater pump stations. Three principal pump stations are located adjacent to San Elijo Lagoon which convey wastewater to the SEWC. These include:

- *Cardiff Pump Station.* The Cardiff Pump Station is owned and operated by the City of Encinitas, and is located along Manchester Avenue across the street from the SEWC. The Cardiff Pump Station conveys wastewater to the SEWC from the Cardiff Gravity Sewer and Cardiff Relief Trunk Sewer, which serve the coastal areas of the Cardiff Sanitary Division within the City of Encinitas.[43]
- *Olivenhain Pump Station.* The Olivenhain Pump Station is located on Manchester Avenue immediately east of Interstate 5. This pump station (owned and operated by the City of Encinitas) conveys flows to the SEWC from the inland portion of the Cardiff Sanitary Division. The Olivenhain Pump Station also handles flows from a small portion of the City of Solana Beach as well as flows from a portion of the RSFCSD.

41 See Section 5.1.1 of the City of Encinitas Final Climate Action Plan (City of Encinitas, January 2018).

42 See Section 4.3.4 of the City of Solana Beach Climate Action Plan (January 2017, revised February 2020).

43 Wastewater from the Cardiff Sanitary Division within the City of Encinitas is conveyed southward to the SEWC. Wastewater from the Encinitas Sanitary Division within the City of Encinitas is conveyed northward to the Encina Wastewater Authority.

- *Solana Beach Pump Station.* The Solana Beach Pump Station is owned and operated by the City of Solana Beach. The Solana Beach Pump Station is located on the coastal side of San Elijo Lagoon and conveys wastewater to the SEWC from the majority of the City of Solana Beach as well as from the City of Del Mar.

Each of the three primary pump stations are protected against near-term flood and coastal erosion effects. While no near-term flooding or erosive effects are projected for City of Encinitas wastewater collection facilities, however, the *City of Encinitas Climate Action Plan* identifies the long-term potential for impact, as follows:

> *By 2100, coastal flooding is projected to impact Cardiff Sewer Pump Station, sewer system infrastructure surrounding San Elijo Lagoon.*[44]

The City of Solana Beach recently completed work on rehabilitating the Solana Beach Pump Station. While the Solana Beach Pump Station is protected against 100-year flood events for the near term, the City of Solana Beach Climate Action Plan notes that:

> *Longer-term sea level will increase rapidly in the second half of the century and will be punctuated by short periods of storm-driven extreme sea levels that will imperil existing infrastructure, structures, and ecosystems with increasing frequency.*[45]

In parallel with the rehabilitation work on the Solana Beach Pump Station, a number of improvements to the hydraulics of San Elijo Lagoon have been implemented as part of the San Elijo Lagoon Restoration Project.46 Adaptation to climate change is an important element of this lagoon restoration project, which involves improvements to the east, central and west basins of San Elijo Lagoon. Hydraulic improvements to the west basin (where the Solana Beach Pump Station is located) which should help to mitigate against future climate-related impacts include, in part:

- dredging the main lagoon channel (north end of the basin) to a greater depth and installing a culvert at the south end to increase tidal circulation and reduce potential flood-related impacts,
- removing the water control feature to ensure that the lagoon remains open to tidal flushing, and
- installing rock slope protection to the western embankment of the lagoon inlet to absorb storm surges to address future sea level rise.[47]

44 City of Encinitas Final Climate Action Plan (2018, 2020), Table 5-1.

45 City of Solana Beach Climate Action Plan (Revised 2020).

46 The project is also known as the Reviving Your Wetlands – San Elijo Lagoon Restoration project. This project was implemented as part of the Build North Coast Corridor program of transportation and environmental enhancements, which is funded through the San Diego County voter-approved regional half-cent sales tax for transportation that is administered by SANDAG (the San Diego Association of Governments). The project is being implemented through collaboration with the Nature Collective (formerly known as the San Elijo Lagoon Conservancy).

47 Source: Nature Collective website, located at: https://thenaturecollective.org/project/san-elijo-lagoon-restoration/.

In addition to the three primary pump stations which convey flow to the SEWC, a number of smaller coastal pump stations are operated by the Cities of Encinitas, Solana Beach, and Del Mar which contribute flow to the three primary pump stations. Some of these smaller pump stations may also be subject to long-term climate change effects such as coastal erosion and coastal flooding.

In summary, all existing SEWC conveyance facilities comply with 100-year-frequency flood and runoff requirements of Order No. R9-2018-0003 and all facilities are projected to continue to comply with these requirements for the near-term. Future site-specific analyses, however, will be required to address long-term (e.g., beyond year 2050) sea level rise and coastal flooding effects on pump stations and conveyance facilities that contribute flow to the SEWC. Facilities warranting such analysis include conveyance facilities located near coastal bluffs or in low-elevation coastal areas.

CHAPTER 3

# GREENHOUSE GAS EMISSIONS

# *Chapter 3*

# *GREENHOUSE GAS EMISSIONS*

## 3.1 GHG Reduction Goals

As noted, climate action plans have been adopted by SEJPA member agencies (Cities of Encinitas and Solana Beach) and by other jurisdictions that contribute wastewater to the SEWC (City of Del Mar and County of San Diego). Each of these adopted climate action plans establish GHG reduction goals and estimate GHG emissions from wastewater facilities.

Facility-specific GHG assessments and reduction goals that target individual wastewater facilities within the SEWC service area have not been developed to date, but each climate plan inventories baseline GHG emissions from the community at large and from aggregate wastewater facilities/operations. Additionally, each agency climate plan identifies GHG reduction goals in accordance with directions established within, Assembly Bill 32, Senate Bill 32, and Executive Orders B-30-15 and S-3-05.[48]

Table 3-1 (page 3-2) summarizes inventoried GHG emissions reported in the climate plans adopted by the Cities of Solana Beach, Encinitas, and Del Mar. Table 3-1 also presents:

- community-wide GHG emissions under "business as usual" conditions,[49] and
- GHG emission targets established in the respective climate plans.

Table 3-2 (page 3-2) presents projected GHG emissions related to wastewater facilities and operations presented in the climate action plans adopted by the Cities of Encinitas, Solana Beach and Del Mar. As shown in Table 3-2, wastewater facilities and operations represent only a fraction of one percent of the total community-wide GHG emissions within the three municipalities that comprise most of the SEWC service area. For comparison, water supply operations comprise approximately 3 percent of projected GHG emissions in the City of Encinitas, 2.2 percent in the City of Solana Beach, and 2.4 percent within the City of Del Mar.[50]

48 The California Global Warming Act of 2006 (Assembly Bill 32) created a multi-year comprehensive program for reducing GHG emissions and established a goal of reducing GHG emission in year 2020 to 1990 levels. Executive Order B-30-15 and Senate Bill 32 extended the goals of Assembly Bill 32 and established a 2030 goal of reducing emissions 40 percent from 2020 levels. Executive Order No. S-3-05 established a goal of reducing GHG emissions to 80 percent below 1990 levels by year 2050.

49 The "business as usual" projections shown in Table 3-1 reflect estimated GHG emissions if no actions are taken to address climate change. Each agency climate action plan also presented projected GHG emissions under "business as usual" conditions which are adjusted to reflect actions mandated under state and federal climate laws, policies, initiatives, regulations.

50 See City of Encinitas (2018, 2020), City of Solana Beach (2017, 2020), and City of Del Mar (2016).

**Table 3-1**
**GHG Emission Reduction Goals and Future Projected GHG Emissions if No Reductions are Achieved**

| Municipality Contributing Flow to the SEWC[51] | Annual Community-Wide GHG Emissions Metric tons per year of Carbon Dioxide equivalents ($CO_2e$)[52] | | | | | | |
|---|---|---|---|---|---|---|---|
| | Baseline Conditions | Projected "Business as Usual" Conditions if No Action is Taken[53] | | | GHG Emission Targets Established in the Climate Action Plans | | |
| | | 2020 | 2030 | 2035 | 2020 | 2030 | 2035 |
| City of Encinitas[54] | 483,773 (Year 2012) | 474,712 | 483,150 | --- | 421,481 | 285,426 | --- |
| City of Solana Beach[55] | 139,216 (Year 2010) | 139,215 | 131,868 | 142,707 | 118,334 | --- | 69,608 |
| City of Del Mar[56] | 55,855 (Year 2012) | 54,822 | --- | 55,314 | 47,477 | --- | 27,928 |

**Table 3-2**
**Projected GHG Emissions Attributed to Wastewater Facilities/Operations**

| Municipality Contributing Flow to the SEWC[52] | Projected Annual GHG Emissions Attributed to Wastewater Facilities/Operations[53] Metric tons per year of Carbon Dioxide equivalents ($CO_2e$) | | | | Wastewater-Related GHG Emissions as a Percent of Total Community-Wide Emissions[53] |
|---|---|---|---|---|---|
| | "Baseline" Conditions | 2020 | 2030 | 2035 | |
| City of Encinitas[55] | 2,155 (Year 2012) | 2,460 | 2,625 | --- | 0.4% |
| City of Solana Beach[56] | 593 (Year 2012) | 617 | --- | 656 | 0.5% |
| City of Del Mar[57] | 81 (Year 2010) | 85 | --- | 90 | 0.1% |

51 The SEWC also receives wastewater from a portion of the Rancho Santa Fe Community Services District (RSFCSD) which is under the land use jurisdiction of the County of San Diego. The portion of the RSFCSD service area that contributes flow to the SEWC is small compared to the total jurisdictional area of San Diego County. County-wide GHG projections (both for the total community and for wastewater facilities) are thus not applicable for this small portion of the RSFCSD area. For this reason, Table 3-1 focuses on the municipalities of Encinitas, Solana Beach and Del Mar, which are almost wholly tributary to the SEWC.

52 Values as presented in the respective climate action plans adopted by the City of Encinitas (2018, updated in 2020), City of Solana Beach (July 2017, updated in 2020) and City of Del Mar (2016).

53 Projected "business as usual" conditions represent conditions under which no actions are taken to reduce future GHG emissions, including actions required pursuant to state and federal laws, policies and regulations, including the California Renewables Portfolio Standards, California Solar Policies and Programs, California Energy Efficiency Standards, and Federal and California vehicle efficiency standards.

54 The City of Encinitas Final Climate Action Plan (January 2018, updated 2020) inventoried GHG emissions during 2012 and utilized years 2020, 2030 and 2050 for GHG milestone projections.

55 The City of Solana Beach Climate Action Plan (July 2017, updated 2020) inventoried GHG emissions during 2010 and utilized years 2020 and 2035 for GHG milestone projections.

56 The Del Mar Climate Action Plan (June 2016) inventoried GHG emissions during 2012 and utilized years 2020 and 2035 for GHG milestone projections.

## 3.2 GHG Reduction Implementation Strategies

**SEJPA Member Agency GHG Reduction Strategies and Actions.** The climate action plans adopted by SEJPA member agencies identify a comprehensive set of goals, actions and targets to reduce GHG emissions. These actions include a combination of ordinances, policies, programs, outreach and education activities, incentives and operational actions.

Table 3-3 (page 3-4) summarizes GHG reduction strategies and implementation actions addressed within the climate action plans of the Cities of Encinitas and Solana Beach (SEJPA member agencies). As shown in Table 3-3, key GHG reduction strategies implemented by SEJPA member agencies include, in part, development of renewable energy, improved building efficiency, reducing energy and water consumption, developing sustainable local water supplies and improving water efficiency.

**SEJPA Implementation Actions.** SEJPA facilities planning efforts and SEWC operations optimization efforts are consistent with the GHG reduction goals established by SEJPA member agencies. These goals are being achieved by (1) investing in energy efficiency and (2) optimizing and improving treatment and treatment reliability while at the same time reducing energy consumption and chemical use. Recent energy efficiency and optimization investments and actions implemented by SEJPA at the SEWC include:

- adding biological selectors within the biological reactors (activated sludge aeration basins) to improve biological treatment and reduce chemical use,
- replacing existing centrifugal air blowers with high efficiency turbo-blowers to reduce energy consumption per million gallons treated,
- installing dissolved oxygen monitoring probes within the activated sludge aeration basins to measure oxygen levels to accurately apply air and optimize energy use,
- installing temperature and nitrogen monitoring probes to collect critical information to optimize biological treatment and minimize use of downstream chemicals, and
- implementing SCADA (supervisory control and data acquisition) process monitoring and automation which reduces pump cycling and energy use.

Actions taken to improve community resiliency, reduce dependency on imported water, and achieve the water efficiency goals of the SEJPA member agency climate action plans include;

- in 2012, constructing micro-filtration treatment for processing of secondary effluent for use as recycled water (1 million gallons per day capacity expansion),
- in 2012, adding 0.5 million gallons per day (mgd) of reverse osmosis capacity to control TDS in the SEWC recycled water,[57]
- expanding recycled water distribution system and offsite storage (Encinitas Ranch Recycled Water Expansion, Village Park RW Expansion, Via de la Valle RW Expansion) which replaced proximately 250 acre-feet per year of potable water consumption with recycled water,

57 This 0.5 mgd of reverse osmosis capacity also will help to control future increases in TDS concentrations which may occur as a result of increased I&I in coastal areas due to sea level rise and increased coastal flooding.

| Table 3-3<br>Summary of GHG Reduction Implementation Strategies and Actions<br>SEJPA Member Agencies | | |
|---|---|---|
| Agency | GHG Reduction Category | Implementation Action Established in Climate Action Plan[59,60] |
| City of Encinitas[58] | 1. Building Efficiency | • Require energy audits of existing residential structures<br>• Require new single-family homes to install solar water heaters<br>• Adopt higher energy standards for commercial buildings<br>• Require commercial buildings to install solar water heaters<br>• Continue implementation of energy-efficient projects in municipal facilities |
| | 2. Renewable Energy | • Establish a community-choice energy program<br>• Require new homes to install photovoltaic systems<br>• Require commercial buildings to install photovoltaic systems<br>• Supply municipal facilities with onsite renewable energy |
| | 3. Water Efficiency | • Reduce City-wide potable water consumption |
| | 4. Clean and Efficient Transportation | • Complete and implement the City-wide active transportation plan<br>• Implement a local shuttle system<br>• Improve traffic flow<br>• Require residential electric vehicle charging stations<br>• Require commercial electric vehicle charging stations<br>• Transition the municipal vehicle fleet to zero emission vehicles (ZEV) |
| | 5. Reduce Off-Road Equipment | • Adopt a leaf blower ordinance to limit use of 2-stroke leaf blowers |
| | 6. Zero Waste | • Implement a zero waste program |
| | 7. Carbon Sequestration | • Develop and implement an urban tree planting program |
| City of Solana Beach[59] | 1. Transportation | • Increase electric vehicles (EVs) and alternative fueled vehicles (AFVs) to 30% of total vehicle miles traveled<br>• Increase commuting by vanpools by 20% of labor force<br>• Reduce average commuter trip distance by 1 mile<br>• Increase commuting by mass transit to 10% of labor force<br>• Increase preferred parking for EVs and AFVs to 20% of eligible parking spots<br>• Retime four traffic signals<br>• Promote telecommuting to achieve 10% participation of labor force<br>• Convert municipal gasoline fueled vehicles to EVs to achieve 50% gasoline reduction<br>• Increase commuting by walking to 5% of the labor force<br>• Increase commuting by bicycling by achieving approximately 17 bike lane miles<br>• Promote alternative work schedule to achieve participation of 1% of the labor force |
| | 2. Renewable Energy and Buildings | • Implement a community choice aggregation program (subject to City Council approval)<br>• Achieve 10.8-megawatt capacity via residential rooftop photovoltaic systems<br>• Achieve 2.0-megawatt capacity via commercial rooftop photovoltaic systems<br>• Solar water heating at 20% of existing commercial spaces<br>• Solar water heating at 25% of new homes and retrofits<br>• Residential energy efficiency retrofits to achieve 15% reduction<br>• Commercial energy efficiency retrofits to achieve 15% reduction |
| | 3. Waste and Water | • Divert 90% of waste from landfills and capture 85% of landfill gas emissions<br>• Implement existing water rate and billing structure<br>• Expand recycled water program to reduce potable water use by 10%<br>• Capture 100 of emissions from wastewater treatment<br>• Water conservation |
| | 4. Carbon Sequestration | • Carbon sequestration (urban tree planting program) |

58 From City of Encinitas Final Climate Action Plan (January 2018, Interim Revision November 2020).

59 From City of Solana Beach Climate Action Plan (July 2017, revised February 2020).

- increasing recycled water use to the point where an average of 57 percent of the SEWC influent flow has been recycled during the past five years (the maximum percent of monthly SEWC flow that has been recycled during this five-year period is 91 percent),
- coordinating with the City of Del Mar to design and install a force main to convey wastewater from Del Mar[60] to the SEWC to (1) utilize unused SEWC treatment capacity and (2) provide the SEWC with a new source of wastewater for helping meet increased SEWC recycled water demands, and
- continuing ongoing efforts to assess means of achieving greater reuse of SEWC recycled water and reducing regional energy usage.[61]

Also consistent with GHG reduction goals of its member agencies, SEJPA is implementing the San Elijo Water Campus Improvements Project, which includes:

- educational features, stormwater improvements and (consistent with traffic reduction goals) the construction of an extension of the North Coast Bike Trail adjacent to the SEWC site, and
- construction of public parking lot near nature trails with and electric vehicle charging station.

Further, SEJPA has constructed new operation and administration facilities that help achieve GHG reduction goals through:

- reduced energy use, and
- implementation of renewable onsite energy via a solar photovoltaic system that produces 0.6 megawatt-hours of 100 of renewable electricity, which makes these new facilities net-neutral in energy consumption and offsets a portion of overall SEWC energy use.

Demonstrating the success of SEWC operations optimization efforts in reducing energy consumption (consistent with GHG reduction goals and strategies), Figure 3-1 (page 3-6) demonstrates the trend in energy reduction per million gallons of treated at the SEWC during the past 15 years. As shown in Figure 3-1, energy use per million gallons treated at SEWC has been cut by nearly half over the past 15 years.[62]

**GHG Reduction Plans of Contributing Agencies.** Proposed GHG reduction strategies and actions are also being implemented by the City of Del Mar (which conveys wastewater flows to the SEWC) and the County of San Diego (which has planning jurisdiction over the portions of the RSFCSD that are tributary to the SEWC. Table 3-4 (page 3-7) summarizes key GHG reduction categories targeted within the *Del Mar Climate Action Plan* and the *County of San Diego Climate Action Plan.*

60 City of Del Mar wastewater flows were previously discharged to the San Diego Metropolitan Sewerage System.

61 The developing tertiary disinfected recycled water utilizes considerably less energy that would be required to convey imported water to the San Diego Region. Recycled water thus represents a net energy offset compared to imported water supplies.

62 Average monthly energy use at the SEWC (exclusive of recycled water operations was approximately 174,000 kilowatt hours during 2005. Since 2015, monthly energy use at the SEWC (exclusive of recycled water operations) has averaged less than 100,000 kilowatt-hours. It is noteworthy that this reduction occurred while flows treated at the SEWC increased as a result of adding the City of Del Mar to the SEWC tributary area.

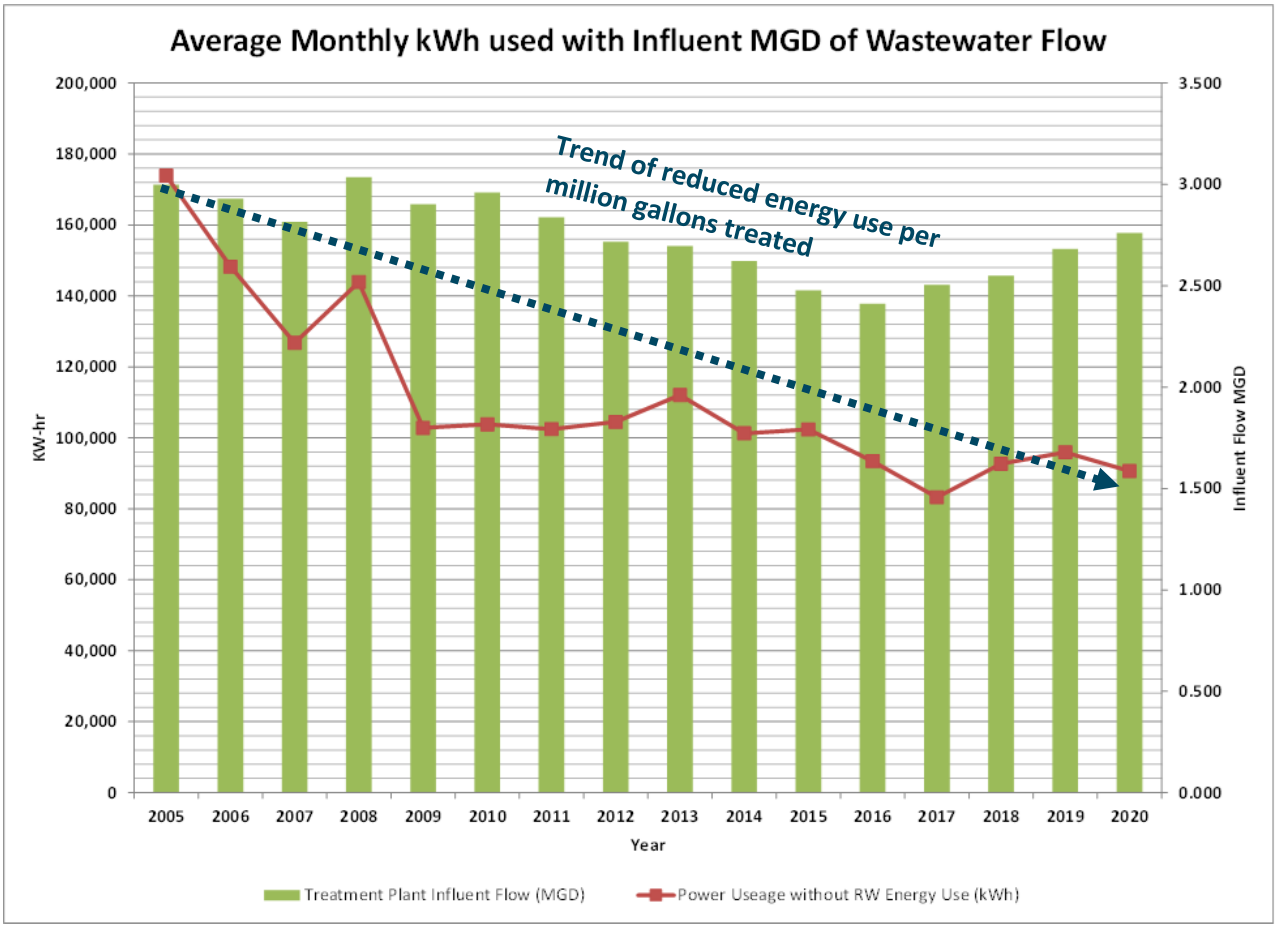


**Figure 3-1 Energy Reduction at the SEWC, 2005-2020**

| Table 3-4<br>Summary of GHG Reduction Implementation Categories<br>Other Jurisdictions Contributing Flow to the SEWC[64,65] | | |
|---|---|---|
| Agency | GHG Reduction Category | Implementation Goal |
| City of Del Mar[63] | 1. Energy and Buildings | • Achieve 0.7 and 1.0 megawatts (MW) of photovoltaics on residential properties by 2020 and 2035<br>• Achieve 1.2 and 1.5 MW of photovoltaics on commercial properties by 2020 and 2035, respectively<br>• Reduce energy demand by 20% and 30% in 10% of residences by 2020 and 2035, respectively<br>• Reduce energy demand by 20% and 50% in 10% of multi-family residencies by 2020 and 2035<br>• Reduce energy demand by 10% and 50% per square foot in 10% of commercial properties by 2020 and 2035, respectively<br>• Retrofit 8% and 15% of homes with solar water heaters by 2020 and 2035, respectively<br>• Achieve 100% renewable energy supply by 2035 |
| | 2. Water and Waste | • Achieve 20% and 40% reduction of indoor water use by 2020 and 2035, respectively<br>• Reduce outdoor water use by 20 and 30 gallons per capita day by 2020 and 2035, respectively<br>• Achieve 80% and 95% solid waste diversion by 2020 and 2035, respectively<br>• Achieve 75% and 80% of methane capture at landfills by 2020 and 2035, respectively<br>• Mandate pool covers on 100% of swimming pools by 2020<br>• Achieve 98 percent methane capture at wastewater treatment plants by 2035 |
| | 3. Transportation | • Achieve 4% mass transit ridership of Del Mar work force by 2020 and 8% by 2035<br>• Install 2.0 and 2.1 miles of bike lanes per square mile by 2020 and 2035 respectively<br>• Achieve “walk to work” percentages of 4% and 10% by 2020 and 2035, respectively<br>• Achieve EV/AFV vehicles comprising 15% of vehicle miles traveled by 2020 and 30% of vehicle miles traveled by 2035<br>• Set aside 10 percent of parking spaces for EVs and AFVs by 2020<br>• Construct at least three traffic roundabouts by 2020<br>• Achieve alternative schedules for 5% and 6% of the work force by 2020 and 2035, respectively<br>• Increase vanpooling to 3 and 5 percent of work force by 2020 and 2035, respectively |
| | 4. Urban Tree Planting | • Develop and implement an urban tree planting program |
| County of San Diego[64] | 1. Built Environment and Transportation | • Reduce vehicle miles traveled<br>• Shift towards alternative modes of transportation<br>• Decarbonize on-road and off-road vehicle fleet<br>• Invest in local projects to offset carbon emissions |
| | 2. Energy | • Increase building energy efficiency<br>• Increase renewable electricity use |
| | 3. Solid Waste and water | • Increase solid waste diversion |
| | 4. Water and Wastewater | • Reduce potable water consumption<br>• Increase rainwater use |
| | 5. Agriculture and Conservation | • Support conversion of agricultural equipment to alternative fuels<br>• Increase carbon sequestration |

63 City of Del Mar wastewater flows are directed to the SEWC through an interagency agreement. The listed GHG reduction strategies are from the *Del Mar Climate Action Plan* (June 2016).

64 The SEWC received flow from a portion of the RSFCSD, which is located within the planning jurisdiction of the County of San Diego. The listed County-wide GHG reduction strategies are from the *County of San Diego Climate Action Plan* (February 2018).

## 3.3 Agency Climate Plan Updates and Progress Reporting

Each of the agency climate plans establish provisions for monitoring GHG inventories and assessing compliance with climate plan and state goals. Each agency' climate plan also establishes provisions for providing progress updates to the respective governing bodies. Table 3-5 summarizes scheduled climate plan update frequencies and progress reporting frequencies for the respective agencies.

Table 3-5
Summary of Monitoring and Reporting Provisions
Climate Action Plans within the SEWC Tributary Area

| Agency | Scheduled Climate Plan Update Interval | Progress Reporting Interval |
|---|---|---|
| City of Encinitas[65] | At discretion of City | Biannual[66] |
| City of Solana Beach[67] | Every 5 years starting in 2022 | Biannual |
| City of Del Mar[68] | Not specified | Annual (or semiannually or at other unspecified intervals) |
| County of San Diego[69] | Every 5 years | Annual: Formal annual monitoring report issued |

65 From *City of Encinitas Final Climate Action Plan* (January 2018, Interim Revision 2020).

66 The City of Encinitas also maintains a web-based dashboard which tracks progress of climate change tasks and actions.

67 From City of Solana Beach Climate Action Plan (July 2017, updated 2020).

68 From the Del Mar Climate Action Plan (June 2016).

69 From the *County of San Diego Climate Action Plan* (February 2018). The County of San Diego is the land use planning agency with jurisdiction within the portion of the Rancho Santa Fe Community Services District that is tributary to the SEWC.

CHAPTER 4

# PLANNING PROCESS FOR ADDRESSING CLIMATE CHANGE

# *Chapter 4*

# *PLANNING PROCESS FOR ADDRESSING CLIMATE CHANGE*

## 4.1 Planning Overview

A number of agencies are responsible for assessing potential climate change impacts on wastewater facilities within the SEWC tributary area. SEJPA is responsible for planning, constructing and operating the SEWC, conveyance facilities to provide recycled water to partner agencies and users, and the SEOO land and ocean outfall system. SEJPA member agencies (the Cities of Encinitas and Solana Beach) are responsible for planning, constructing, and maintaining wastewater collection and conveyance facilities which deliver wastewater to the SEWC. As municipalities, SEJPA member agencies also are responsible for land use planning and implementing climate action plans within their respective jurisdictions.

Similarly, outside agencies that contribute flow to the SEWC (City of Del Mar and RSFCSD) are responsible for planning, constructing and maintaining their respective wastewater collection and conveyance facilities. As such, the City of Del Mar and County of San Diego (the agency responsible for land use planning within the RSFCSD) handle climate action planning within their jurisdictions.
While no site-specific vulnerability analyses have been conducted to date, SEJPA, SEJPA member agencies, and agencies that contribute flow to the SEWC have taken a number of preliminary steps to:

- identify potential climate-related risks[70] to wastewater facilities, and
- identify areas where additional planning work is required to assess or respond to climate-related risks.

## 4.2 SEJPA Wastewater Planning and Climate Change

**Lack of Near-Term Vulnerabilities of Existing SEJPA Facilities.** As documented in Chapter 2, in the near term, SEJPA treatment facilities and processes are not projected to be discernibly impacted by sea level rise, coastal erosion or other climate-related effects due to the elevation and location of the SEWC site.
Nonetheless, climate change has represented an important planning consideration in implementing improvements at the SEWC. Recent energy efficiency and treatment optimization improvements at the SEWC, for example, are consistent with agency and regional GHG reduction strategies and goals. Further, SEJPAs expanded recycled water efforts are consistent with State of California water supply goals, goals

70 Preliminary risks to SEJPA and wastewater collection facilities that contribute flow to the SEWC are summarized in Chapter 2 of this CCAP.

established by the RWQCB as part of the *San Diego Water Board Practical Visio*n, and goals established within the climate action plans of SEJPA member agencies.[71]

**Climate Change and Wastewater Planning.** SEWC planning needs (including considerations associated with climate change) are addressed through several ongoing and/or periodic planning efforts, in part, including:

- facilities plans for the SEWC, and
- the annual SEJPA Capital Improvements Program (CIPs) which implement facilities improvements or rehabilitation efforts addressed in the SEWC facilities plans.

*SEWC Facility Plan.* SEJPA maintains and periodically updates a master plan for the SEWC. The *2015 Facility Plan for the San Elijo Joint Powers Authority San Elijo Water Reclamation Facility* (hereinafter SEWC Facilities Plan) is the current master plan for the SEWC.[72] The SEWC Facilities Plan identifies and prioritizes potential improvements at the SEWC. Climate planning is an important element of the SEWC Facilities Plan. Section 3.5.1.9 of the 2015 SEWC Facilities Plan acknowledges that, while no near-term climate related impacts on SEWC facilities or operations are projected, future climate-related studies and planning are warranted, as follows:

Specific climate change issues addressed within this strategy [statewide climate adaptation strategy] that warrant future SEJPA facilities planning attention include:

- Effects of projected rises in seawater levels on SEJPA wastewater treatment and conveyance facilities and wastewater collection facilities of SEJPA member agencies,
- Potential effects of seawater level changes on inflow and infiltration into wastewater collection systems tributary to the SEWRF,[73] and
- Changes in regional hydrology, which may affect wet weather peak, flow hydraulics and peak flow-sizing considerations for wastewater conveyance and treatment facilities.

The SEWC Facilities Plan is periodically updated by SEJPA as directed by the SEJPA Board and as necessary to address changed conditions. As part of such periodic updates, SEJPA will update climate assessments, facilities vulnerability analyses, and assess potential facilities or operational modifications that are consistent with reducing GHG emissions, enhancing water supply, and meeting other goals of the agency climate action plans.

*SEJPA Capital improvements Program (CIP).* The SEJPA adopts an annual fiscal year budget to accomplish the SEJPA mission of providing wastewater treatment, water reclamation and waste disposal to ratepayers while meeting state and federal water quality standards. Each annual budget includes a Capital

71 As documented herein, climate action plans established by the Cities of Encinitas and Solana Beach (SEJPA member agencies) include goals for increasing the use of recycled water. State of California recycled water goals are established in the *Water Quality Control Policy for Recycled Water* (SWRCB, 2019). RWQCB water supply goals are established in the *San Diego Water Board Practical Vision* (RWQCB, 2013).

72 See Carollo Engineers and San Elijo Joint Powers Authority (2015).

73 The San Elijo Water Reclamation Facility (SEWRF) is now known as the San Elijo Water Campus (SEWC).

Improvement Program (CIP) for both new and ongoing projects for improvements to wastewater treatment, the ocean outfall system, pumping stations and the recycled water program. CIP projects include projects identified within the SEWC Facilities Plan and other projects or improvements required to address facilities needs or to better achieve SEJPA goals. Many of the projects addressed within the CIP include elements help SEJPA achieve improved energy efficiency, reduce GHG emissions, improve water quality, or enhance regional water supplies.

As previously described, examples of recent projects that have proceeded through the SEJPA planning process and have helped SEJPA achieve climate-related benefits include:

- *Treatment Optimization Improvements.* As part of this afore-mentioned project, improvements to the SEWC have been implemented (see page 3-3) to improve energy efficiency and to optimize treatment. These improvements include adding biological selectors within the biological reactors, replacing existing centrifugal air blowers with high efficiency turbo-blowers, installing dissolved oxygen monitoring probes within the activated sludge aeration basins to measure oxygen levels to accurately apply air, installing temperature and nitrogen monitoring probes to collect critical information to optimize biological treatment and minimize use of downstream chemicals,, and implementing SCADA process monitoring and automation which reduces pump cycling saves energy
- *Water Campus Improvements Project.* As part of this afore-mentioned project, the existing storm channel is being replaced by underground culverts and a segment of the North Coast Bike Trail is to be constructed along the culvert alignment to help achieve traffic reduction goals. Additionally, the project includes educational features and parking facilities for nature trails, and an electric vehicle charging station.
- *SEWC Preliminary Treatment Improvements.* SEJPA has constructed a new preliminary treatment system to expand capacity for accepting peak wet weather flows by more than 50 percent. These preliminary treatment improvements position SEJPA to improve readiness for handling more extreme weather conditions.
- *SEOO Land Outfall Replacement.* SEJPA in 2020 completed replacement of the land outfall portion of the SEOO which tunneled under the San Elijo Lagoon Reserve and passes under the North County Transit District rail lines, the SDGE regional gas line, and terminates at the Cardiff Beach. In addition to meeting current state requirements for outfall design and structural reliability, the land outfall replacement provides improved protection against potential increased erosive effects associated with climate change.
- *New Administrative Facilities.* Newly constructed administrative facilities at the SEWC feature low energy use, are compatible with projected sea level rise, and include solar power generating facilities capable of producing 600 kilowatt hours of renewable energy, which makes the new facilities net-neutral in energy consumption and offsets a portion of energy use for operating SEWC treatment facilities.
- *Recycled Water Improvements.* Adding advance treatment processes (microfiltration) to treat SEWC recycled water and expanding the recycled water distribution system to provide increased recycled water supplies which offset potable water use.

## 4.2 Tributary Agency Wastewater Planning and Climate Change

**Potential Collection System Vulnerabilities.** As noted, existing wastewater collection facilities within the SEWC tributary area are adequately protected in the near term against coastal flooding and erosive effects associated with sea level rise. Worst-case sea level rise projections for the latter half of the 21st century, however, indicate the potential for sea level rise (and associated erosive effects) to adversely impact low elevation wastewater collection facilities near the coast and San Elijo Lagoon.

As additional sea level rise data and projections become available in the future, facility-specific vulnerability assessments will be required to assess risks to collection facilities, including key pump stations such as the Cardiff Pump Station, Olivenhain Pump Station, and Solana Beach Pump Station. The need for such future vulnerability analyses is outlined in the respective climate action plans of the Cities of Encinitas and Solana Beach.

**Ongoing/Periodically Updated Wastewater Plans.** Climate change risks, facility vulnerabilities, and climate adaptation strategies will be considered as part of a number of ongoing or periodic planning efforts by agencies that contribute wastewater flow to the SEWC. These ongoing or periodic planning efforts include:

- *Updates to Climate Action Plans.* As discussed in Section 3.3 (page 3-8), each of the adopted climate action plans developed within the SEWC tributary area are to be periodically updated. As the respective climate action plans are updated, the updated plans will present refined assessments of how projected climate change will impact wastewater facilities. The updated plans, where warranted, will also identify any support studies (such as wastewater system vulnerability assessments) that are planned or in progress to assess climate adaptation strategies for lessening climate-related risks to wastewater facilities.
- *Updates to Sewer Master Plans.* Sewer master plans are maintained by each agency that contributes wastewater to the SEWC.[74] The sewer master plans assess existing and future sewer facility needs, present recommendations on required improvements, and evaluate probable costs of proposed improvements. As part of these analyses, the sewer master plans evaluate the condition and capacity of major elements of the existing wastewater collection systems. The sewer master plans also evaluate risks associated with flooding, sea level rise, and projected trends in I&I and, if warranted, identify proposed facilities improvements to guard against such risks.
- *Updates to Sewer System Management Plans (SSMPs).* SWRCB Order Nos. 2006-0003-DWQ and 2013-0058-EXEC establish state-wide discharge requirements for sanitary sewer collection systems and require each enrolling agency to develop, maintain and update SSMPs. SSMPs are required to include an operation and maintenance plan, design and performance provisions, system evaluation and capacity assurance provisions, and a monitoring program for assessing sanitary sewer overflows (SSOs). SSMPs must be updated every five years. While climate-change effects are not explicitly addressed in the SWRCB Orders, requirements governing the prevention of SSOs implicitly require

74 This includes the *Cardiff and Encinitas Sewer Master Plan Update* (Dudek and the City of Encinitas, 2011), which addresses facilities within the Cardiff Sanitation Division of the City of Encinitas, as well as sewer master plans for the City of Solana Beach, the City of Del Mar, and RSFCSD.

that capacity and planning analyses take into account anticipated future conditions, including climate change.

- *Facility-Specific Studies.* Sewer agencies contributing flow to the SEWC may periodically elect to conduct facility-specific planning studies to assess special needs. Climate change effects will be addressed, as applicable, with any of these special planning studies. Such planning studies may directly evaluate facility vulnerabilities resulting from climate change. At the discretion of the agencies, such special planning studies may also evaluate opportunities for expanded recycled water use, wet weather wastewater handling needs, opportunities for capturing dry weather runoff, changes in flow trends due to changed land use or updated interagency agreements, or other issues requiring planning outside of the normal agency wastewater plan updates.
- *Annual Budget Planning and CIPs.* Each wastewater agency implements an annual fiscal year budget process that incorporates a CIP that addresses wastewater collection facilities needs within the agency's sewer service area. Each agency's CIP addresses any facility upgrades or new facilities required to maintain or upgrade the agency's wastewater collection system.

Table 4-1 summarizes typical update frequencies for these ongoing, scheduled or special climate-related planning efforts. Results from these ongoing wastewater plan updates will be reported, where applicable, within future updates to the SEJPA CCAP.

Table 4-1
Summary of Scheduled, Periodic and Special Planning Efforts
Related to Wastewater Facilities and Climate Change

| Planning activity | Update Frequency | Agency | | | | |
|---|---|---|---|---|---|---|
| | | City of Encinitas | City of Solana Beach | City of Del Mar | RSFCSD | County of San Diego |
| Updates to climate action plans | Every 5 years | ✓[75] | ✓ | ✓[76] | | ✓ |
| Update to sewer master plans | As required | ✓ | ✓ | ✓ | ✓ | |
| Updates to SSMPs | Every 5 years[76] | ✓ | ✓ | ✓ | ✓ | |
| Facility-specific plans | As required | ✓ | ✓ | ✓ | ✓ | |
| Annual budget and CIPs | Annually | ✓ | ✓ | ✓ | ✓ | |

75 Climate action plans adopted by the City of Encinitas and City of Del Mar do not explicitly state a scheduled climate action plan update frequency.

76 Five-year SSMP update frequency is mandated by SWRCB Order No. WQO 2006-0003, as revised by SWRCB Order No. WQ 2013-0003.

CHAPTER 5

# IMPLEMENTATION

# *Chapter 5*

# *IMPLEMENTATION*

## 5.1 Schedule for Updating the CCAP

Special Studies Requirement VI.A of the Monitoring and Reporting Program of Order No. R9-2018-0003 requires that the SEJPA CCAP include a proposed schedule for updating the CCAP as more information on climate change and its effects become more available.

As documented in Chapter 2, no immediate climate-related impacts on SEJPA facilities or wastewater collection facilities are projected to occur in the near term. Further, a number of ongoing and periodic SEJPA and agency planning efforts will, in part, assess facilities and operations needs and climate impacts. These include annual CIP updates as well as periodic updates to wastewater facilities master plans.

While no near-term climate-related impacts are projected, it is probable that the next update of the agency climate plans (and any associated vulnerability assessments) will include updated information on projected impacts and proposed mitigation strategies. Updates to each of the agency climate plans are anticipated within the next five years.

Given that no immediate climate-related impacts are projected, SEJPA proposes to complete an update to this CCAP by the earlier of the following:

- as required by the RWQCB in an update or amendment to Order No. R9-2018-0003,
- as directed by the SEJPA Board of Directors, or
- by the end of the succeeding NPDES permit term.[77]

To the degree that updated information becomes available, the updated SEJPA CCAP will incorporate:

- any new or revised climate change projections that have been developed since submittal of this CCAP,
- any climate-related studies that have been completed by SEJPA or contributing agencies,
- any revisions agency climate action plans,

77 Order No. R9-2018-0003 expires on May 31, 2023. It is projected that the subsequent five-year NPDES permit term will extend to 2028 (or beyond if administratively extended by the RWQCB).

- updates on the SEJPA and agency GHG reduction efforts,
- updates on climate-related research that may affect wastewater facilities or operations,
- updates on efforts to assess facilities vulnerability and resiliency,
- any relevant climate-related changes in SEJPA facilities or operations that have been identified or proposed,
- any additional future steps SEJPA or contributing agencies may be proposing to address climate change effects, identify proposed climate adaptation, and
- a proposed schedule for developing future updates of the CCAP.

## 5.2 Finance Issues Related to Climate Change

Special Studies Requirement VI.A of the Monitoring and Reporting Program of Order No. R9-2018-0003 requires that the SEJPA CCAP include a discussion of "the financing needed to pay for planned actions."

On the basis of climate change planning conducted to date, no additional near-term changes[78] to current SEJPA or member agency facilities or operations are required over and above those that are currently being implemented.[79] Near-term climate change conditions have already been considered as part of existing SEJPA and member agency plans and facilities assessments.

Normal SEJPA and agency wastewater system operations are funded through sewer fees paid by users. Infrastructure improvements (depending on the nature of the improvement) may be funded by a combination of user fees, government grants or loans, or private financing. Through its annual budgeting processes, SEJPA and its member agencies are presented with proposed budgets for both direct and indirect climate-related infrastructure expenditures as well as CIPs that present long-range plans (a multiple year budget forecast) for all individual capital improvements projects and financing.[80] For any proposed infrastructure improvement, the respective governing body assesses cost/benefits and determines the method of funding.

SEJPA, SEJPA member agencies and contributing agencies are committed to continuing efforts to meet the climate change challenges and meet the climate change goals established by the State of California and within agency climate plans. To this end, SEJPA and the agencies within their respective annual budget process will target adequate resources and funding to complete the requisite studies, facilities improvements, or operational modifications identified in adopted wastewater plans.

78 Near term changes include modifications that would be required to address climate change effects that occur within the current NPDES permit term or within the subsequent five-year NPDES cycle.

79 Ongoing and current climate-related projects such as the SEJPA Water Campus Improvements Project and SEWC treatment optimization project has already been addressed and funded.

80 CIP projects are unique construction, rehabilitation, or infrastructure improvement projects. Annual budgets adopted by SEJPA and the agencies also address funding for any required studies, master plans, or operational considerations.

## 5.3 Adequacy of Existing NPDES Permit Provisions

No change in NPDES requirements is anticipated to address near-term or long-term climate-related impacts to SEJPA wastewater operations, either as part of Order No. R9-2018-0003 (which expires in 2023) or as part of the subsequent five-year NPDES permit renewal cycle.

As noted, assessing climate change issues (particularly sea level rise and coastal flood conditions) will be part of all future SEJPA, member agency, and contributing and agency wastewater facilities plans. If these assessments determine the need for any significant changes in SEJPA or member agency facilities or operations, such changes will be addressed by SEJPA through the submittal of a Report of Waste Discharge that requests amended permit conditions and describes the changes and the rationale for the requested NPDES permit revisions.[81]

81 As required by law, a Report of Waste Discharge will be submitted in the event that (after SEJPA consultation with the RWQCB), the RWQCB determines that climate-related operational or facilities changes proposed by SEJPA are sufficiently significant to warrant the submittal of a Report of Waste Discharge.

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# *REFERENCES*


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