

# **Riverside Public Utilities**

## **CEC-RPS Annual Compliance Report for Calendar Year 2020 and Compliance Period 3**

Prepared by RPU Resource Operations and Strategic Analytics (ROSA) Division  
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## 1. Riverside Public Utilities

Riverside Public Utilities (RPU) was established in 1895, under the provisions of the California Constitution and Article XII of the City Charter. Riverside Public Utilities is supervised by the Public Utilities General Manager, and under the management and control of the City Manager, subject to the powers and duties vested in the Board of Public Utilities and the City Council. RPU provides high quality, reliable services to over 110,500 metered electric customers and 65,500 metered water customers throughout the City of Riverside, CA. RPU has a peak summer load of approximately 625 MW and an annual retail load of approximately 2,150 GWh. The Utility is committed to increasing its use of renewable resources and promoting sustainable living practices that help reduce environmental impacts within the City of Riverside and the state of California.

The following Annual RPS Compliance Report for 2020 and Compliance Period 3 is being filed with the CEC in partial satisfaction of the annual reporting requirement for RPS compliance (Title 20, Division 2, Chapter 13, Section 3207.(c).1-4 and 3207.(d)). This report provides a high-level overview of the eligible, contracted renewable energy resources acquired by Riverside through December 31, 2020. This overview includes a general description of each renewable energy resource, including their Portfolio Content Category (PCC) classification, contracting details, LTR contract status, and expected (or observed) annual generation amounts. The annual forecasted generation amounts for each resource are also presented through 2030, along with projections of our expected RPS procurement percentages for this same time period. This documentation complements the following information being supplied to the CEC through the online portal:

- CEC-POU-RPS annual summary information and attestations
- WREGIS PCC-0, and PCC-1 Compliance reports for calendar years 2020
- WREGIS Compliance report for our 100% RET (green energy tariff) for calendar year 2020
- E-Tag and hourly “lesser-of” reports for our ARB Loyaltan Biomass project for calendar year 2020,
- All supplemental LTR reports and applicable contracts
- RPU’s adopted RPS Procurement Policy document (and supporting resolutions), and
- All WREGIS Attestation forms

Questions concerning the technical details presented in this 2020 & CP3 Compliance Report should be directed to Scott M. Lesch, Resources Manager – Resource Planning & Technology Integration, Riverside Public Utilities at [slesch@riversideca.gov](mailto:slesch@riversideca.gov).

## 2. Riverside’s Renewable Energy Resources

### 2.1 Grandfathered (PCC-0) Resource Details

In 2020, Riverside had two Power Purchase Agreement (PPA) contracts for renewable energy that qualified as grandfathered resources under the SB X1-2 RPS paradigm. The primary PPA was for 46 MW of base-load geothermal energy from the CalEnergy Salton Sea Unit 5 geothermal plant in Imperial Valley, CA. Riverside entered into a 15 year PPA contract with Cal-Energy for base-load output from this plant in August 2005; this contract expired on May 31, 2020. Historically, this geothermal facility has generated between 275,000 and 350,000 MWh of renewable energy annually. In 2020, this plant only produced 66,668 MWh of renewable energy from January through May.

Riverside also has a second grandfathered PPA with Wintec Inc., for renewable energy from two small wind turbines in Riverside County, CA. This long-term contract was executed in January 2003 and was set to expire on December 30, 2018. However, this contract was extended in 2019 for five additional years, subject to a reduced \$/MWh delivery price. These two turbines have a combined nameplate capacity of 1.3 MW and a historical capacity factor of approximately 35%, and thus typically generate between 3,000 to 4,000 MWh of renewable energy annually. In 2020, these turbines produced 3,773 MWh of renewable energy.

Table 2.1 shows the amount of PCC-0 energy associated with these two resources that RPU is claiming on its 2020 Annual RPS compliance filing with the CEC.

**Table 2.1.** Delivered and retired 2020 WREGIS PCC-0 RECs associated with the grandfathered Salton Sea Unit 5 (geothermal) and Wintec (wind) resources (MWh units).

PCC-0 Resource	Delivered 2020 WREGIS RECs (MWh)	Retired 2020 RECs (MWh)
Salton Sea Unit 5	66,668	66,668
Wintec	3,773	3,773
<b>Total</b>		<b>70,441</b>

### 2.2 2020 Short-term Renewable Energy Purchases

Since early 2011, Riverside has been periodically procuring short term renewable energy products in all three portfolio content categories in order to satisfy our SB X1-2 renewable mandates. In 2019, Riverside extended a short term (one year) contract with Cal-Energy to accept up to 3 MW per hour of incremental energy deliveries from the Salton Sea Unit 5 geothermal plant. These incremental deliveries occur when the plant is capable of producing more than 46 MW per hour of energy.

This WSPP contract originally took effect on June 1, 2017 and ended on May 31, 2018. In May 2018, the WSPP contract was renewed for one additional year. In May 2019, the WSPP contract was renewed for another additional year (i.e., through May 31, 2020, which represents the end of the primary Salton Sea Unit 5 contract). In 2020, Salton Sea Unit 5 delivered 1,113 MWh of additional short term PCC-1 energy to Riverside, before this contract ended on May 31.

On September 10, 2018 and October 9, 2018, Riverside’s Board of Public Utilities and City Council approved RPU’s Updated 2018 Renewable Energy Procurement Policy. This new Procurement Policy adopted a 65% long-term renewable energy contracting requirement for Compliance Period 3, along with new excess procurement rules that allow for the “banking” of short-term PCC-1 RECs on or after January 1, 2017. Riverside is opting for voluntary early compliance with the long-term procurement requirement (LTR) in pursuant to CEC RPS regulations 3206(a)(1)(G) and 3206(a)(1)(I)3. Subject to these new rules, Riverside is electing to retire these 1,113 MWh of short-term PCC-1 (incremental Salton Sea Unit 5) RECs obtained in 2020. Note that the WSPP contract pertaining to this transaction was previously submitted to the CEC during RPU’s 2019 compliance filing.

In addition to the above WSPP agreement, in April 2018 Riverside also began receiving its proportional share of energy from the ARP Loyalton biomass facility, in partial satisfaction of SB 859. This five-year, multi-party PSA/PPA for biomass energy (involving SMUD, MID and TID, plus four SCPPA members – RPU, APU, LADWP and IID) partially satisfies Riverside’s requirement to contract for 1.4 MW of capacity from CA RPS certified biomass generation facilities consuming Tier 2 and Tier 3 high-hazard forest fuel. Unfortunately, in January 2020 the Loyalton biomass facility declared bankruptcy and ceased producing energy. Currently, this plant is still offline.

Finally, in March 2020 Riverside’s City Council approved a second SB 859 biomass contract with Roseburg Forest Products Company (again, via a multi-party PSA/PPA). This contract, while completing Riverside’s requirement to contract for 1.4 MW of capacity from CA RPS certified biomass generation facilities, is for SB 859 attributes and plant capacity only. Thus, Riverside does not expect to receive any renewable energy RECs from this contract. (Additional details pertaining to this contract are presented in Appendix A.)

### **2.3 2020 Short-term Renewable Energy Sales**

In 2020, RPU did not sell any energy or RECs from its portfolio of renewable energy resources to any counterparties.

### **2.4 2020 Long-term Renewable Energy Purchases**

As reported each year, Riverside has been actively contracting for cost effective, new long-term renewable resources. Consistent with this objective, on November 9, 2020 and January 5, 2021 the Public Utilities Board and the City Council approved a new 20-year long-term renewable energy PSA

through SCPPA for the partial output of baseload geothermal energy from Coso Geothermal Power Holdings, LLC. Riverside will begin receiving about 10 MW of baseload energy from their China Lake, CA geothermal facility in January 2022; these energy deliveries are scheduled to increase to about 30 MW in January 2027. Overall, this contract is expected to deliver about 83,000 MWh of renewable energy annually beginning in 2022, increasing to 249,000 MWh annually on/after 2027. Coso is expected to qualify as a long-term PCC-1 in-state renewable resource.

A listing of all the long-term renewable resources in Riverside’s portfolio is shown in Table 2.3 and all these post-2010 contracted resources are discussed in greater detail in Appendix B. All supporting documentation for any contract which was currently on-line as of December 31, 2020 has already been submitted to the CEC in our prior RPS filings.

**Table 2.3.** New long-term renewable contracts and/or resources acquired by the City of Riverside since 2011.

Project Name	MW Capacity	Expected MWh Energy	Expected COD	Generation Technology	PCC	Pre-Existing Resource	CC Approval Date
WKN Wind	6	19,500	On-line	Wind	PCC-1	No	12/18/12
Columbia II	11	30,800	On-line	Solar PV	PCC-1	No	9/24/13
Cabazon	39	40,000	On-line	Wind	PCC-1	Yes	12/3/13
North Lake	20	47,000	On-line	Solar PV	PCC-1	No	10/9/12
CE-2016	20	147,200	On-line	Geothermal	PCC-1	Yes	5/14/13
CE-2019	20	147,200	On-line	Geothermal	PCC-1	Yes	5/14/13
CE-2020	46	338,400	On-line	Geothermal	PCC-1	Yes	5/14/13
Kingbird B	14	41,650	On-line	Solar PV	PCC-1	No	9/24/13
Tequesquite	7.3	15,000	On-line	Solar PV	PCC-1	No	3/4/14
Summer Solar	10	23,500	On-line	Solar PV	PCC-1	No	4/1/14
Antelope Big Sky	10	23,500	On-line	Solar PV	PCC-1	No	4/1/14
Antelope DSR 1	25	71,200	On-line	Solar PV	PCC-1	No	7/28/15
Camino LLC	44	148,000	5/2023	Solar PV/BESS	PCC-1	No	12/17/19
Coso-2022	10	83,000	1/2022	Geothermal	PCC-1	Yes	1/05/21
Coso-2027	20	166,000	1/2027	Geothermal	PCC-1	Yes	1/05/21

As of December 31, 2020, ten of the twelve renewable resources shown in Table 2.3 were on-line and delivering energy to the City of Riverside. Table 2.4 shows the amounts of 2020 generated energy and retired PCC-1 RECs associated with these ten long-term resources and two short-term resources that the City of Riverside has chosen to claim on its 2020 Annual RPS compliance filing (MWh).

**Table 2.4.** Generated energy and 2020 WREGIS PCC-1 RECs retired towards Riverside’s primary compliance account, by resource and contract type.

Project Name (resource technology)	Contract Type	2020: Total Energy & RECs (MWh)
WKN Wind (wind)	Long-term	13,875
Columbia II (solar PV)	Long-term	31,664
Cabazon (wind)	Long-term	33,882
North Lake (solar PV)	Long-term	43,143
CE-2016/2019/2020 (geothermal)	Long-term	526,137
Kingbird B (solar PV)	Long-term	40,002
Tequesquite (solar PV)	Long-term	13,885
Summer Solar (solar PV)	Long-term	27,258
Antelope Big Sky (solar PV)	Long-term	26,183
Antelope DSR 1 (solar PV)	Long-term	64,245
Salton Sea 5 (incremental geothermal)	Short-term	1,113
ARP Loyalton (biomass)	Short-term	4
<b>Total of All PCC-1 Resources</b>		<b>821,391</b>

Finally, Table 2.5 shows the amounts of 2020 generated energy and PCC-1 RECs retired towards Riverside’s new 100% Renewable Energy Tariff (RET) program. Note that the renewable energy provided by this 100% RET program comes from four of the contracted resources that are located physically within or nearby Riverside’s service territory.

**Table 2.5.** Generated energy and 2020 WREGIS PCC-1 RECs retired towards Riverside’s 100% RET compliance account, by resource and contract type.

Project Name (resource technology)	Contract Type	2020: Total Energy & Retired RECs (MWh)
CE-2016/2019/2020 (geothermal)	Long-term	89
Tequesquite (solar PV)	Long-term	27
Cabazon (wind)	Long-term	35
North Lake (solar PV)	Long-term	27
<b>Total of All PCC-1 Resources</b>		<b>178</b>

## 2.5 RPU Adjusted Retail Sales & Retired RECs (Section 3207(c)(2)(I) Narrative)

In CY 2020, Riverside recorded 2,144,679 MWh in retail sales. This total sales figure includes 28,771 MWh of internal consumption and 178 MWh of 100% renewable energy sales to RPU customers enrolled in the 100% Renewable Energy Tariff program.

Table 2.6 shows the observed RPS metrics for Riverside for CP3 (2017-2020). As shown in Table 2.6, RPU will retire enough RECs to remain significantly above our minimum annual RPS targets. Additionally, RPU plans on applying all 768,803 MWh of Historic Carryover credits towards the utility's Compliance Period 3 mandates. These actions will effectively allow Riverside to “bank” about 1.48 million PCC-1 RECs as excess procurement RECs for use in future compliance periods.

With respect to our internal RPU Electric and Water sales, 2,346.3 MWh were consumed by our Electric utility division (general services) and 26,424.5 MWh were consumed by our Water utility division. For the latter division, approximately 90% of the MWh were used for water pumping and treatment operations and the remaining 10% were used for general services. In both divisions, general services power includes power for commercial lighting, office equipment, HVAC equipment, and miscellaneous maintenance facilities.

**Table 2.6.** Observed 2017, 2018, 2019 and 2020 CP3 RPS metrics for Riverside.

RPS Metric	2017	2018	2019	2020
Retail Sales	2,227,979	2,165,453	2,105,660	2,144,679
Internal RPU Electric/Water Sales	27,289	29,007	27,132	28,771
100% RET Customers	0	0	75	178
Adjusted Retail Sales	2,200,690	2,136,446	2,078,453	2,115,730
Annual RPS Target	27.0%	29.0%	31.0%	33.0%
Corresponding Procurement Target	594,186	619,569	644,320	698,191
Applied Historic Carryover Credits	262,048	365,280	141,474	0
Applied PCC-0 RECs	332,138	254,289	199,032	70,441
Applied PCC-1 RECs	519,932	490,571	582,566	821,391
Applied PCC-2 RECs	0	0	0	0
Applied PCC-3 RECs	0	0	0	0
Total RECs Applied to Compliance	1,114,118	1,110,140	923,072	891,832
Excess Procurement PCC-1 RECs	519,932	490,571	278,752	193,641
Achieved RPS Level (see Note)	36.3%	34.6%	37.6%	42.2%

Note: RPS calculation excludes all HC credits, and also delayed retirement RECs.

## **2.6 Public Goods funds collected during CP3 (Section 3207(c)(2)(G) Narrative)**

In 2008, Riverside Public Utilities launched the “Green Power Program”, a voluntary program available to all RPU electric customers interested in helping Riverside achieve and surpass its renewable energy goals. Customers who opted into this program paid an additional \$0.02 per kWh of electricity used, above their current per-kWh rate. The main purpose of this program was to raise additional funds that would go directly towards the purchase of renewable energy. At the end of December 2018 RPU discontinued this program and replaced it (in January 2019) with a “100% Renewable Energy Tariff” (100% RET) program. Customers who voluntarily moved onto this tariff pay an additional \$0.0179 per kWh premium over OATT in order to receive 100% renewable energy. This 100% RET option is now open to all Residential and Commercial customers.

Following the guidelines of SB-1, Riverside had also been allocating a proportion of its general Public Goods funds towards both residential and commercial/industrial/government (C/I/G) solar PV rebates for our customers. In CY 2016, the utility allocated \$977,821 in incentive payments towards 516 residential and 9 C/I/G customer rebates for 3,410 kW of installed solar PV capacity. The SB 1 rebate program officially ended on December 31, 2016. More detailed information concerning the history of this solar PV rebate program can be found in the utility’s previously filed SB 1 Program Status reports.



### 3. Riverside's Renewable Energy Forecasts through 2030

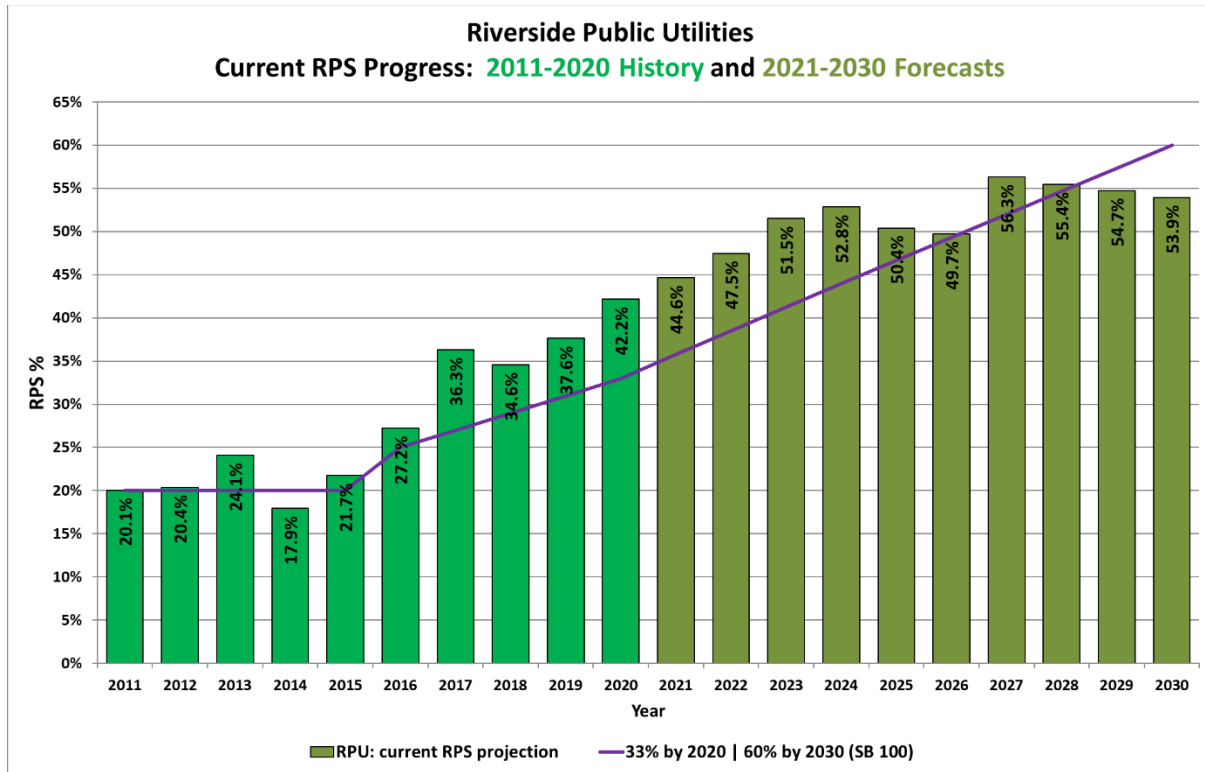
#### 3.1 New Long-term Renewable Energy Purchases: Demonstration of Reasonable Progress (Section 3207(c)(3))

For the last ten years, Riverside has actively contracted for cost effective, new long-term renewable resources with expected COD's in the 2013-2022 timeframe. More details about the twelve new long-term renewable resource contracts shown in Table 2.4 can be found in Appendix B.

Each of these additional contracts were identified and selected for RPU's renewable portfolio using a best-fit, least-cost procurement strategy with the goal of exceeding our 33% RPS mandate by 2020 and meeting our future mandates beyond 2020. Appendix C quantifies the combined effect of these new renewable PPA's on our future procurement needs. As shown in both Appendix C and Figure 3.1 on the next page, these additional PCC-1 resources should supply Riverside with enough new renewable energy to significantly exceed all of our minimum RPS and PCC mandates well beyond 2020. More specifically, assuming these contracts continue to perform as expected, Riverside expects to exceed a 50% RPS in 2023 (based on our current load forecasts).

Figure 3.1 shows Riverside's historic and forecasted renewable energy generation levels for the 2011-2030 time frame, along with the expected SB 100 mandated RPS goals. It should be noted that all but two of our renewable generation projects are currently delivering energy and the Coso geothermal resources already exist. Thus, nearly 90% of our forecasted new PCC-1 renewable energy generation is not subject to project development risk. Likewise, it is also worth noting that all of our new long-term contracts qualify as long-term PCC-1 resources. Hence, Riverside has preserved considerable latitude and flexibility to procure additional short-term PCC-1 and/or PCC-2 products, or PCC-3 tradable RECs in future compliance years, should the need arise.

As shown in Figure 3.1, Riverside expects to receive excess PCC-1 renewable energy through at least 2025 under the expected SB 100 compliance obligations. We intend to bank this energy as excess procurement for use in later compliance years, but also reserve the right to monetize some of this excess procurement if/when such activities are in the best interest of our ratepayers.



**Figure 3.1.** Riverside’s achieved (2011-2020) and forecasted (2021-2030) renewable energy amounts, by year. Note that the overlaid purple line defines our expected (SB 100) minimum annual RPS mandates.

### 3.2 Reasonable RPS Procurement Progress for Actions Planned (Section 3207(c)(4))

In addition to the signed renewable contracts discussed in section 3.1 and Appendix B, Riverside remains open to the potential to contract for additional short- or long-term, cost-effective PCC-1 resources to meet our future anticipated energy needs. Riverside continues to actively participate in the annual SCPPA renewable energy RFP process, conduct bilateral discussions with potential project developers and support customer based (i.e., local DG) renewable energy projects. Additionally, Riverside is keenly aware of the 60% by 2030 targets recently adopted in SB 100. RPU continues to actively plan to meet and/or exceed these higher post-2020 RPS mandates.

### **3.3 Potential Delay of Timely Compliance (Section 3207(c)(2)(H))**

Riverside does not currently anticipate any delays in meeting our future RPS compliance obligations. Additionally, given that the CEC has approved our claims for approximately 769,000 MWh of additional Historic Carryover (HC) credits, Riverside can still meet its minimum compliance obligations even under a catastrophic resource failure scenario. As shown in Figure 3.1, Riverside is currently projected to exceed a 44% RPS level in 2021 and a 50% RPS in 2023, while remaining above the minimum SB 100 RPS levels at least through 2025. Additionally, Riverside anticipates having sufficient excess RPS compliance credits to account for any significant generation outage events.

### **3.4 Actions Taken or Planned to Ensure Timely Compliance (Section 3207(c)(2)(H))**

As documented in Appendices A and B, under the direction of Riverside's Public Utilities Board and City Council, Riverside has already contracted for enough additional energy from eligible renewable resources to ensure that we comfortably exceed all SB X1-2 RPS mandates through 2024. The ROSA Division within Riverside Public Utilities continues to focus on monitoring our current portfolio of contracts to ensure that they actually deliver power at or near their expected energy levels. Additionally, as discussed in section 3.2, the ROSA Division intends to continue to actively identify new or existing renewable resources that can be used to increase our renewable energy percentages beyond 2020. More specifically, we will continue to seek to identify and procure contracts that are commercially viable, enhance and diversify the RPU resource portfolio, mitigate future regulatory risks, reduce our carbon footprint and optimize our renewable procurement content category requirements in the most cost effective manner possible.

## **Supplemental Appendices**

**Appendix A.** Details concerning the short-term renewable resource contracts discussed in section 2.2.

**Appendix B.** Details concerning the long-term renewable resource contracts discussed in section 2.4.

**Appendix C.** RPU RPS Compliance Period and Portfolio Content Category accounting spreadsheet.

## Appendix A.

### Details concerning the short-term renewable resource contracts discussed in section 2.2.

- Starting in 2017, Riverside began executing one short term WSPP contract with CalEnergy to accept up to 3 MW per hour of incremental energy deliveries from the Salton Sea Unit 5 geothermal plant. These incremental deliveries occur when the plant is capable of producing more than 46 MW per hour of energy. This WSPP contract originally took effect on June 1, 2017 and ended on May 31, 2018. In May 2018, the WSPP contract was renewed for one additional year. In May 2019, the WSPP contract was renewed for another additional year (i.e., through May 31, 2020, which represents the end of the primary Salton Sea Unit 5 contract). These WSPP contracts allowed CalEnergy to deliver up to 10,000 MWh of additional short-term, incremental PCC-1 renewable energy per contract year to Riverside.
- The Public Utilities Board and City Council approved a five-year term, biomass project with American Renewable Power-Loyalton Cogen, LLC on January 8, 2018 and January 23, 2018, respectively, through Riverside's participation in the Southern California Public Power Authority (a.k.a. "ARP-Loyalton Biomass"). This project was procured to meet the requirements of Senate Bill 859, which required specific utilities to procure their proportionate share of potential biomass-fueled resources utilizing high hazard fuel sources. The ARP-Loyalton Biomass project achieved full commercial operation in April 2018 and this biomass project qualifies as a PCC-1 renewable resource scheduled into a California balancing authority. Unfortunately, in January 2020 the Loyalton biomass facility declared bankruptcy and ceased producing energy. Currently, this plant is still offline.
- The Public Utilities Board and City Council approved a five-year term, biomass project with Roseburg Forest Products Company on February 24, 2020 and March 17, 2020, respectively, through Riverside's participation in the Southern California Public Power Authority (a.k.a. "Roseburg Biomass"). This project was procured to meet the remaining requirements of Senate Bill 859, which required specific utilities to procure their proportionate share of potential biomass-fueled resources utilizing high hazard fuel sources. The Roseburg Biomass project is for SB 859 attributes and plant capacity only. Thus, Riverside does not expect to receive any renewable energy RECs from this contract.

## Appendix B.

Details concerning the long-term renewable resource contracts discussed in section 2.4.

- The Public Utilities Board and City Council approved a new long-term renewable wind PPA with WKN Wagner Limited on November 16, 2012 and December 18, 2012, respectively, for 6 MW of wind turbine capacity in Riverside County, CA. The WKN wind project began commercial operation at the end of December 2012, and typically generates between 13,000 to 16,000 MWh of energy annually. WKN qualifies as a PCC-1 in-state renewable resource.
- The Public Utilities Board and the City Council approved a new long-term renewable energy PPA with North Lake Solar L.P. on September 21, 2012 and October 9, 2012, respectively, to construct and operate a 20 MW utility scale solar PV project in Hemet, CA. The North Lake Solar project reached COD in July 2015. On a prospective basis, this project is expected to generate about 47,000 MWh of renewable energy annually. North Lake Solar qualifies as a PCC-1 in-state renewable resource.
- The Public Utilities Board and the City Council approved a long-term, utility scale solar PV project with Silverado Inc. on December 7, 2012 and January 8, 2013, respectively, through Riverside's participation in the Southern California Public Power Authority. This project was subsequently amended to facilitate a later COD date and re-permitted to encompass two distinct sites (i.e., Summer Solar and Antelope Big Sky). Additionally, this contract was subsequently sold by Silverado to S-Power. These re-permitted S-Power solar PV projects achieved full operation in July and August 2016 and typically generate a combined 55,000 MWh of renewable energy annually. Both S-Power projects qualify as PCC-1 in-state renewable resources.
- The Public Utilities Board and the City Council approved a new long-term PPA with Cal-Energy L.L.C. on May 3, 2013 and May 14, 2013, respectively, to incrementally procure additional geothermal resources from a portfolio of up to ten Cal-Energy (CE) geothermal generation units to meet Riverside's future base-load renewable energy needs. This new geothermal PPA began providing an additional 20 MW of base-load energy in calendar year 2016, and increased to an additional 40 MW in calendar year 2019. Upon the expiration of our current Salton Sea 5 contract, this new PPA has ramped up to 86 MW and should generate approximately 633,000 MWh/year (at an assumed 84% CF) until the expiration of the new contract in 2039. Riverside began receiving the first 20 MW of this new portfolio energy in February 2016, the second 20 MW component in January 2019 and the final 46 MW component in June 2020. The energy received from the CE geothermal portfolio qualifies as PCC-1 renewable energy (from existing in-state renewable resources).

- The Public Utilities Board and the City Council approved two long-term, utility scale solar PV projects with RE Clearwater LLC and RE Columbia II LLC on September 6, 2013 and September 24, 2013, respectively, through Riverside's participation in the Southern California Public Power Authority (a.k.a. "Recurrent Projects"). The Columbia II solar PV project began producing test energy in late November 2014 and reached full commercial operation in December 2014. This facility supplies Riverside with about 31,000 MWh of energy annually and qualifies as a PCC-1 in-state renewable resource. In early 2014, the Clearwater project was declared to be in default, due to the inability of the developer to secure the necessary county land use permits. This latter contract was terminated in 2015.
- The Public Utilities Board and the City Council approved a long-term, utility scale solar PV project with Kingbird Solar B, LLC on September 6, 2013 and September 24, 2013, respectively, through Riverside's participation in the Southern California Public Power Authority (a.k.a. "First Solar"). This Kingbird B project achieved full commercial operation on April 30, 2016 and typically generates about 41,000 MWh of renewable energy annually. This solar PV project qualifies as a PCC-1 in-state renewable resource.
- The Public Utilities Board and the City Council approved a new long-term renewable energy PPA with FPL Energy Cabazon Wind, LLC on November 15, 2013, and December 3, 2013, respectively, to purchase the full wind energy output from the existing 39 MW Cabazon wind farm. This wind farm has been operating since 1999, and typically generates between 55,000 to 83,000 MWh of renewable energy annually. However, in September 2020 this wind farm experienced a catastrophic turbine failure event, which caused the facility to shut down for 90 days. Currently, all the turbines at this facility are undergoing safety overhauls, and about 20% of these turbines are expected to be taken permanently off-line. Hence, for the remainder of this contract, this Cabazon facility is expected to produce less energy on an annual basis. The Cabazon wind farm qualifies as a PCC-1 in-state renewable resource.
- The Public Utilities Board and the City Council approved a new long-term renewable energy PPA with Solar Star CA XXXI, LLC on February 7, 2014 and March 4, 2014, respectively, to construct and operate a 7.3 MW utility scale solar PV project on the Tequesquite landfill in the city of Riverside, CA (a.k.a. "Tequesquite"). Tequesquite became fully operational in early September 2015 and the project typically generates about 14,800 MWh of renewable energy annually. Tequesquite qualifies as both a PCC-1 in-state renewable resource and a local utility operated DER.
- The Public Utilities Board and the City Council approved a long-term, utility scale solar PV project with sPower on June 19, 2015 and July 28, 2015, respectively, through Riverside's participation in the Southern California Public Power Authority (a.k.a. "Antelope DSR 1"). Riverside receives 50% of the output power from this 50 MW solar PV project, and the

associated PPA includes an additional option for SCPPA participants to develop an on-site energy storage facility at some future date. This Antelope DSR 1 project achieved full operation in late November 2016 and typically delivers about 65,850 MWh of renewable energy annually to Riverside. This solar PV project qualifies as a PCC-1 in-state renewable resource.

- The Public Utilities Board and the City Council approved a new 15-year long-term renewable energy PPA with Camino Solar LLC on November 25, 2019 and December 17, 2019 for a 44 MW solar PV facility coupled with an 11 MW / 44 MWh Battery Energy Storage System (BESS). This PV/BESS system was scheduled to begin commercial operation by April 2022, but contracting delays have now caused this COD to shift to May 2023. Camino Solar is expected to generate about 148,000 MWh of renewable energy annually and qualify as a PCC-1 in-state renewable resource. Additionally, the associated BESS will help Riverside significantly exceed its goal of deploying at least 6 MW of energy storage on/after 2020.
- The Public Utilities Board and the City Council approved a new 20-year long-term renewable energy PSA through SCPPA on November 9, 2020 and January 5, 2021 for the partial output of baseload geothermal energy from Coso Geothermal Power Holdings, LLC. Riverside will begin receiving about 10 MW of baseload energy from their China Lake, CA geothermal facility in January 2022; these energy deliveries are scheduled to increase to about 30 MW in January 2027. Overall, this contract is expected to deliver about 83,000 MWh of renewable energy annually beginning in 2022, increasing to 249,000 MWh annually on/after 2027. Coso is expected to qualify as a long-term PCC-1 in-state renewable resource.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA		
1	APPENDIX C. RPU RPS Workbook - CP & PCC Accounting Spreadsheet.																												
2	Note: All energy units are on a GWh basis. Risk factors affect 2014-2030 production numbers only. Renewable resource assets with annual energy production < 500 MWh not shown.																												
3	PCC	Resource	Contract Length (1 = 10+ years)	Fuel Source (technology)	2011	2012	2013	CP1	2014	2015	2016	CP2	2017	2018	2019	2020	CP3	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030		
4																													
5																													
6																													
7	0	Salton Sea 5	n/a	geothermal	348.73	291.35	289.86	929.94	291.98	338.77	318.47	949.22	328.12	350.57	321.23	66.67	1066.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
8	0	Wintec	n/a	wind	4.10	4.00	4.36	12.46	3.93	3.97	3.84	11.74	3.88	3.15	3.08	3.77	13.88	3.50	3.50	3.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
9	0	Short-term Sales	n/a	geothermal							-75.00	-75.00	0.00	-107.00	-125.00	0.00	-232.00												
10																													
11		Total			352.83	295.35	294.22	942.40	295.91	342.75	247.31	885.96	332.00	246.72	199.30	70.44	848.46	3.50	3.50	3.50	0.00	0.00	0.00	0.00	0.00	0.00			
12																													
13	1	WKN Wind	1	wind	0.00	0.00	18.70	18.70	20.87	16.81	19.17	56.85	17.62	13.78	15.75	13.88	61.02	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50	18.50		
14	1	Covanta (short-term)	0	waste-to-energy	0.00	12.42	149.91	162.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
15	1	North Lake	1	solar PV	0.00	0.00	0.00	0.00	0.00	19.61	47.72	67.33	42.00	46.05	42.58	43.14	173.77	46.00	45.50	45.00	44.50	44.00	43.50	43.00	42.50	42.00			
16	1	Antelope Big Sky	1	solar PV	0.00	0.00	0.00	0.00	0.00	0.00	8.64	0.00	28.34	28.78	27.72	26.18	92.50	28.00	27.75	27.50	27.25	27.00	26.75	26.50	26.25	25.75			
17	1	Summer Solar	1	solar PV	0.00	0.00	0.00	0.00	0.00	0.00	11.75	11.75	28.15	28.66	27.42	27.26	111.49	28.00	27.75	27.50	27.25	27.00	26.75	26.50	26.25	25.75			
18	1	CalEnergy (Portfolio)	1	geothermal	0.00	0.00	0.00	0.00	0.00	0.00	119.67	119.67	132.25	145.68	271.39	526.14	1075.46	632.82	632.82	632.82	632.82	632.82	632.82	632.82	632.82	632.82			
19	1	Cabazon	1	wind	0.00	0.00	0.00	0.00	0.00	57.04	57.91	114.95	58.74	63.69	47.92	33.88	204.23	30.00	42.00	42.00	42.00	0.00	0.00	0.00	0.00	0.00			
20	1	Kingbird B	1	solar PV	0.00	0.00	0.00	0.00	0.00	0.00	30.60	30.60	41.49	41.31	38.33	40.00	161.13	40.65	40.45	40.25	40.05	39.85	39.65	39.45	39.25	38.85			
21	1	Columbia II	1	solar PV	0.00	0.00	0.00	0.00	0.00	32.05	32.86	64.91	31.25	30.52	31.19	31.66	124.62	29.95	29.80	29.65	29.50	29.35	29.20	29.05	28.90	28.75			
22	1	Tequesquite	1	solar PV	0.00	0.00	0.00	0.00	0.00	5.36	15.10	20.46	14.69	14.88	14.48	13.89	57.93	14.60	14.50	14.40	14.30	14.20	14.10	14.00	13.90	13.70			
23	1	Antelope DSR 1	1	solar PV	0.00	0.00	0.00	0.00	0.00	0.00	3.34	3.34	66.06	66.25	64.18	64.25	260.74	65.05	64.65	64.25	63.85	63.45	63.05	62.65	62.25	61.85			
24	1	Camino	1	solar PV + BESS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	99.80	148.03	147.29	146.55	145.82	145.09	144.37	143.64			
25	1	Coso Geothermal	1	geothermal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	83.00	83.00	83.00	83.00	83.00	249.00	249.00	249.00			
26	1	Loyalton Biomass	0	biomass	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.04	1.33	0.00	3.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
27	1	Salton Sea 5 Inc	0	geothermal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.16	10.20	0.33	1.11	17.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
28																													
29		Total			0.00	12.42	168.61	181.03	20.87	130.87	346.76	489.86	466.75	491.84	582.60	821.39	2344.07	933.57	1026.72	1124.67	1171.05	1126.46	1123.87	1287.29	1284.71	1282.14			
30																													
31	2	Ibedrola	0	wind	20.38	0.00	0.00	20.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
32	2	PowerEx	0	wind	0.00	9.90	3.24	13.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
33	2	PacifiCorp	0	wind	0.00	0.00	51.53	51.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
34																													
35		Total			20.38	9.90	54.77	85.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
36																													
37	3	TREC's	0	various	37.50	125.00	0.00	162.50	75.00	0.00	0.00	75.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
38																													
39	Initial	Retail Load (adjusted for internal sales)			2047.28	2171.96	2147.94	6367.18	2184.64	2179.43	2182.81	6546.88	2200.69	2136.45	2078.53	2115.73	8804.90	2099.61	2170.40	2190.70	2217.10	2234.64	2259.28	2285.19	2317.44	2341.83			
40	Load & RPS	% Mandate			20.00%	20.00%	20.00%		20.00%	20.00%	25.00%		27.00%	29.00%	31.00%	33.00%		35.75%	38.50%	41.25%	44.00%	46.67%	49.33%	52.00%	54.67%	57.33%			
41	Calculations	RPS Target			409.46	434.39	429.59	1273.44	436.93	435.89	545.70	1418.52	594.19	619.57	644.34	698.19	2556.29	750.61	835.60	903.66	975.52	1042.90	1114.50	1188.30	1266.95	1342.57			
42		Post PCC-0 Target			56.63	139.04	135.37	331.04	141.02	93.14	298.39	532.56	262.19	372.85	445.04	627.75	1707.83	747.11	832.10	900.16	975.52	1042.90	1114.50	1188.30	1266.95	1342.57			
43		% PCC1 Mandate (>)						165.52				346.16	1280.87	560.33	624.08	675.12	1780.87	747.11	832.10	900.16	975.52	1042.90	1114.50	1188.30	1266.95	1342.57			
44		% PCC3 Mandate (<)						82.76				79.88	170.78	74.71	83.21	90.02	170.78	74.71	83.21	90.02	97.55	104.29	111.45	118.83	126.69	134.26			
45																													
46	Initial	Achieved PCC1			0.00	12.42	168.61	181.03	20.87	130.87	346.76	489.86	466.75	491.84	582.60	821.39	2344.07	933.57	1026.72	1124.67	1171.05	1126.46	1123.87	1287.29	1284.71	1282.14			
47	summation	Achieved PCC2			20.38	9.90	54.77	85.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
48	of RPS	Achieved PCC3			37.50	125.00	0.00	162.50	75.00	0.00	0.00	75.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
49	energy	Achieved Total			57.88	147.32	223.38	428.58	95.87	130.87	346.76	564.86	466.75	491.84	582.60	821.39	2344.07	933.57	1026.72	1124.67	1171.05	1126.46	1123.87	1287.29	1284.71	1282.14			
50		Superficial RPS % (Power Content Label)			20.06%																								