PRU and R-GPCD Calculation

June 24, 2021

This document contains suggested methods for estimating Percentage Residential Use (PRU), and explains how daily residential per capita water use (R-GPCD) is calculated by Water Board staff. As of October 1st, 2020, the R-GPCD is automatically calculated in the reporting tool. The methodology outlined here has not changed since the initial guidance was developed for the emergency conservation regulations.

When estimating PRU, we recommend using billing data to determine the volume of water provided to residential customers as a percentage of Total Monthly Potable Water Production. In cases where billing periods are not based on calendar month, the urban water supplier should use discretion in selecting the most comparable and appropriate billing period. PRU, rather than residential use volume, is requested in the monthly conservation report because it can be calculated using the previous year's data if current billing data is not available.

Please note that the total production value used to calculate PRU should be the same value that is entered in the monthly report.

Total Production

Total production is defined in Section 990 f of the Water Code as "…all potable water that enters into a water supplier's distribution system, **excluding water placed into storage and not withdrawn for use during the reporting period and excluding water exported outsider the supplier's service area during the reporting period.**"

Included in Total Production	Excluded from Total Production
• Water produced from supplier's sources • Water purchased from other suppliers • Non-revenue water (e.g. leaks, theft, water used to fight fires) • Commercial agriculture	• Water produced, but stored rather than delivered • Wholesale water sold to other agencies

Note that commercial agriculture is included in the **reported** total production, **but subtracted from the PRU calculation**, as shown in the following examples.

Example PRU Calculation: Using recent billing data to estimate PRU

Total Production (T): 1543.98 Acre-feet (AF)

Commercial Agriculture (C): 20 AF

Residential Use (R)[1]: 1001.42 AF

1. Subtract Commercial Agriculture (if any) from Total Production

$$Total\ Production, minus\ Agriculture\ (TPA) = T - C$$
$$TPA = 1543.98 - 20 = 1523.98\ AF$$

2. Divide Residential Use by (Total Production – Commercial Agriculture)

$$PRU = \frac{R}{TPA} \times 100$$

$$PRU = \frac{1001.42}{1523.98} \times 100 = 65.71\%$$

If you do not have billing data for the current reporting month, use last year's data (**BOTH** residential use and total potable production) for the month that corresponds to the reporting month. For example, if you do not currently have October 2020 billing data available, use October 2019 data. **This calculated PRU using last year's data should be entered in the "Preliminary" column when submitting a report.** Once you have current billing data, re-calculate the PRU using current numbers and enter the new value in the "Final" column of the edited report.

Example PRU Calculation: Bi-Monthly Billing Cycle Initial Estimate

Total Production (T) Over Billing Cycle: 3002.15 AF

Commercial Agriculture (C) Over Billing Cycle: 35 AF

Residential Use (R) Over Billing Cycle: 1900.23 AF

Length of Billing Cycle: 61 days

Reporting Month: May

Days in May: 31 days

1. Subtract Commercial Agriculture (if any) from total production

$$Total\ Production, minus\ Agriculture\ (TPA) = T - C$$
$$TPA = 3002.15 - 35 = 2967.15\ AF$$

2. Calculate Residential Use for Reporting Month (RM) and Total Production for Reporting Month (TPM)

[1] When estimating "Residential Use," we recommend using billing data to determine the volume of water provided to residential customers. In cases where billing periods are not based on calendar month, the urban water supplier should use discretion in selecting the most comparable and appropriate billing period.

$$TPA\ for\ May\ (TPM) = \frac{TPA \times days\ in\ May}{days\ in\ billing\ cycle}$$

$$TPM = \frac{2967.15 \times 31}{61} = 1507.90\ AF$$

$$R\ for\ May\ (RM) = \frac{R \times days\ in\ May}{days\ in\ billing\ cycle}$$

$$RM = \frac{1900.23 \times 31}{61} = 965.69\ AF$$

3. Divide Residential Use for Reporting Month by (Total Production – Commercial Agriculture) for Reporting Month

$$PRU = \frac{RM}{TPM} \times 100$$

$$PRU = \frac{965.69}{1507.90} \times 100 = 64.04\%$$

Please note in the "Qualification" box that the billing data is bi-monthly. As with the previous PRU calculation example, if you do not have billing data that encompasses the current reporting month, please use billing data from the previous year to estimate PRU and enter the value in the "Preliminary" column.

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Example Residential Gallons Per Capita Daily (R-GPCD) Calculation

The updated reporting tool automatically calculates the monthly R-GPCD value. The calculation methodology is outlined below.

Original Units	Conversion Factor (CF) from Original Units to Gallons
Gallons (G)	1
Million Gallons (MG)	1000000
Hundred Cubic Feet (CCF)	748.052
Acre Feet (AF)	325851

Total Production (T): 1543.98 AF

Commercial Agriculture (C): 20 AF

Percentage Residential Use (PRU): 65.71%

Population (P): 69078 people

Month: May

Days in Month: 31 days

Conversion Factor (CF): 325851

1. Subtract Commercial Agriculture (if any) from Total Production

$$Total\ Production, minus\ Agriculture\ (TPA) = T - C$$

$$TPA = 1543.98 - 20 = 1523.98\ AF$$

2. Convert (Total Production-Commercial Agriculture) to Gallons, using the Conversion Factor

$$TPA\ in\ Gallons\ (TG) = TPA \times CF$$

$$TG = 1523.98 \times 325851 = 496590407\ G$$

3. Multiply the Total Production Gallons by Percentage Residential Use to get Residential Use in Gallons

$$Residential\ Use\ in\ Gallons\ (RG) = TG \times \frac{PRU}{100}$$

$$RG = 496590407 \times \frac{65.71}{100} = 326313708\ G$$

4. Divide Residential Use by (Population x Days in Month) to get R-GPCD

$$R - GPCD\ for\ May = \frac{RG}{P \times days\ in\ May}$$

$$R - GPCD\ for\ May = \frac{326313708}{690798 \times 31} = 152.38\ GPCD$$