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Commercial Mixed-Use Meter Application

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Moulton Niguel Water District

- Drinking water, wastewater treatment, recycled water
- 7-member Board of Directors
- 170,000 residents
- 55,000 accounts
- 1,700 CII accounts
- Full AMI deployment anticipated Nov. 2021
- Water Budget Based Rate Agency

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CII Performance Measures

- AB 1668 requires DWR, in coordination with the State Water Board, to conduct necessary studies and investigations to develop recommendations on performance measures for CII water use by October 1, 2021, for consideration in adoption by the State Water Board (CWC 10609.10(a) AB).

  - CII water use classification system.
  - Minimum size thresholds for converting **mixed** CII meters to dedicated irrigation meters.
  - Technologies that could be used in lieu of requiring dedicated irrigation meters.
  - Best management practices including water audits and water management plans for CII customers above a certain size, volume of use, or other threshold.

SWRCB shall adopt performance measures for CII water use by June 30, 2022.

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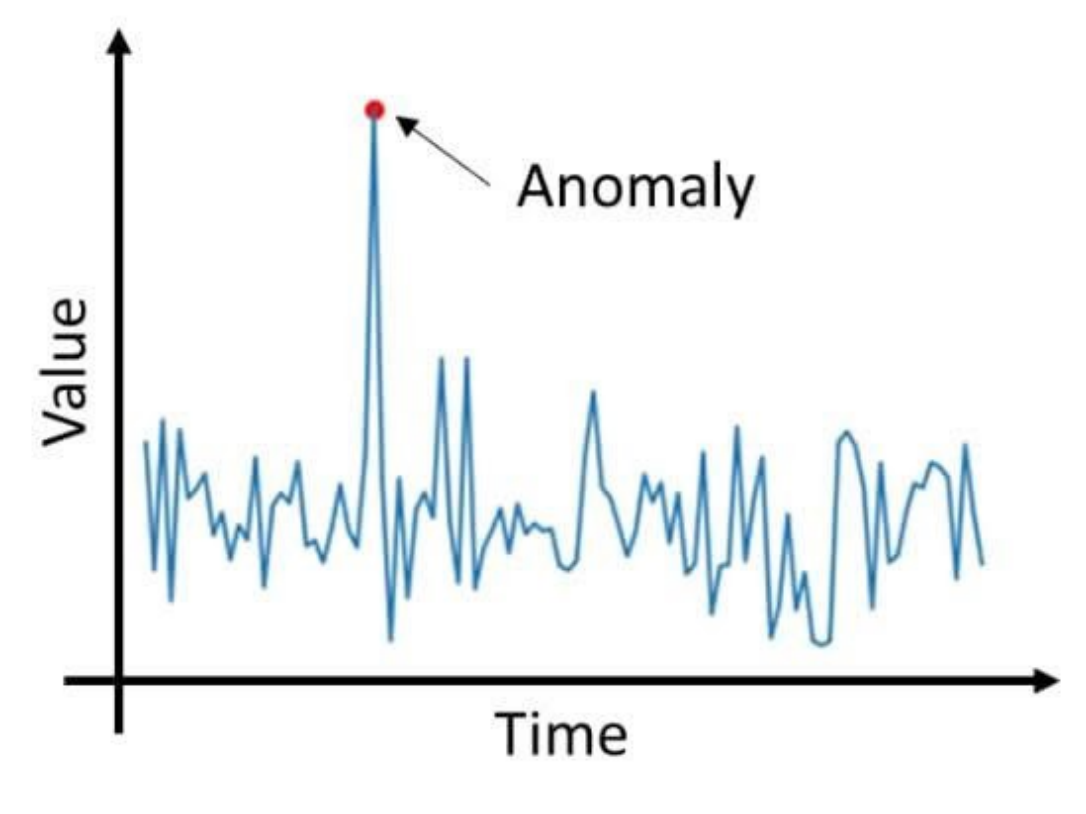
Commercial Mixed-Use Meter Identification

- Mixed-Use: Indoor and outdoor water measured by one meter
- Goal: Locate all mixed-use meters, catalogue plumbing configurations, & measure and map irrigated/irrigable area
- Mixed-use meters are often identified manually, either by a field test or staff noticing monthly consumption dropping significantly in winter and/or significantly increasing in summer

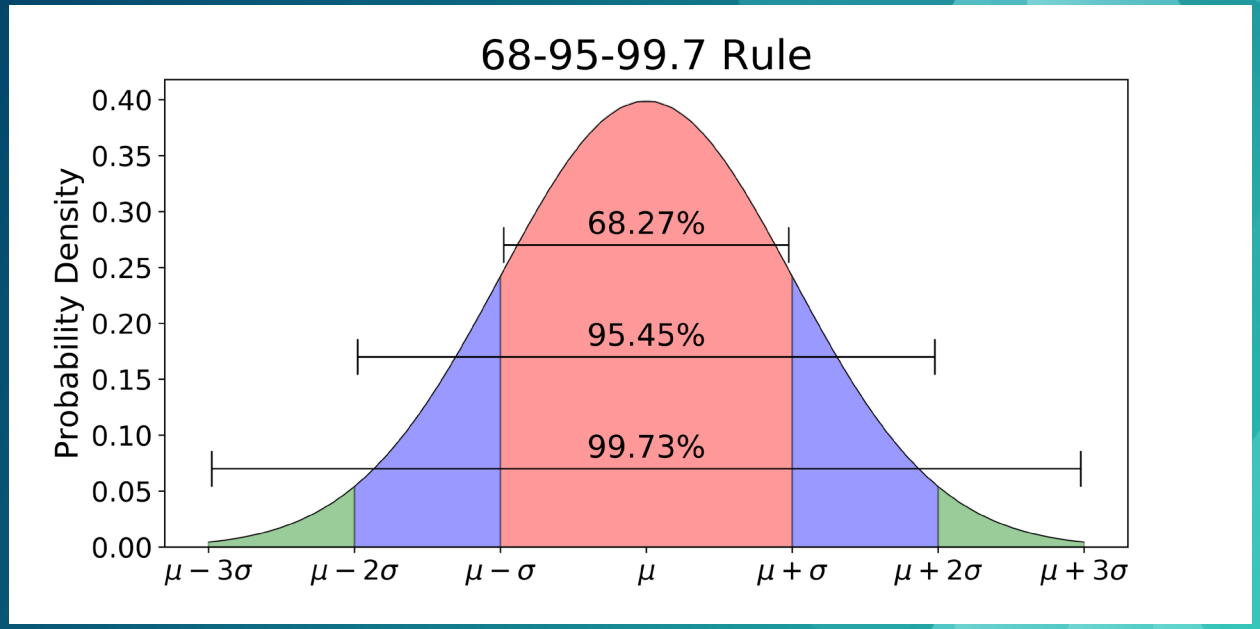
How can we use AMI data & analytics to prioritize which meters to test for mixed-use?



- Irrigation is often a spike in hourly consumption. With this in mind, the first step to identify mixed meters was to do an anomaly detection.
- In data analysis, anomaly detection (outlier detection) is the identification of rare events or observations which raise suspicions because it is significantly different than the rest of the data.
- By calculating the standard deviation for a set of data, we can determine anomalies.

Statistical References

- Mean (μ) (Average)
  - a calculated "central" value of a set of numbers
- Standard Deviation (σ)
  - A measure of how spread out a set of numbers are
- Normal Distribution
  - 68.3% is within 1 standard deviation
  - 95.5% is within 2 standard deviations
  - 99.7% is within 3 standard deviations



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Methodology

- Anomaly detection limitations
  - Hourly water consumption is naturally anomalous
- To better identify irrigation, a few more criteria had to be added
- Assumption: commercial irrigation is scheduled using an irrigation timer on a weekly frequency

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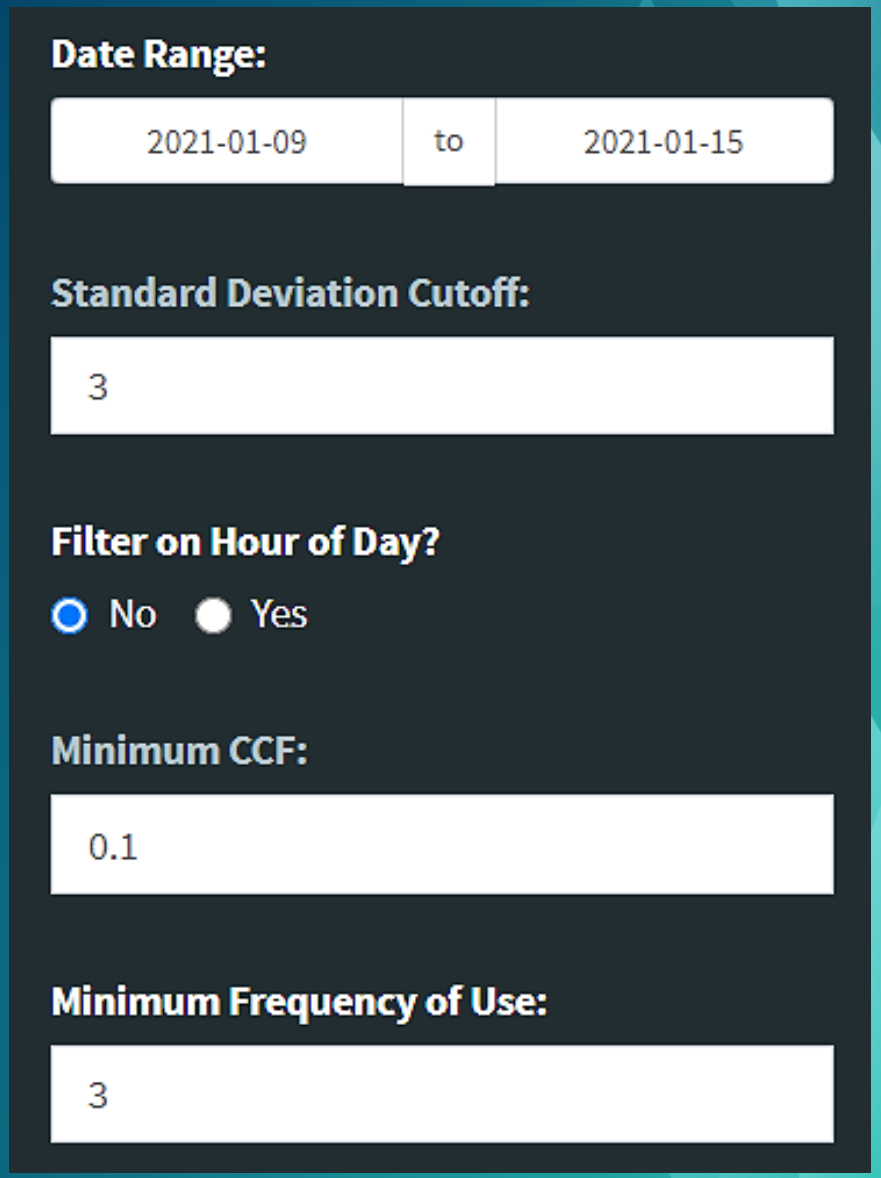
Criteria for Identifying Mixed Meters

- Standard deviation to detect an anomaly
  - 3
- Frequency of anomaly
  - 3 in 1 week
- Minimum consumption to be considered an anomaly
  - 0.1 CCF
- Hour of day (optional)



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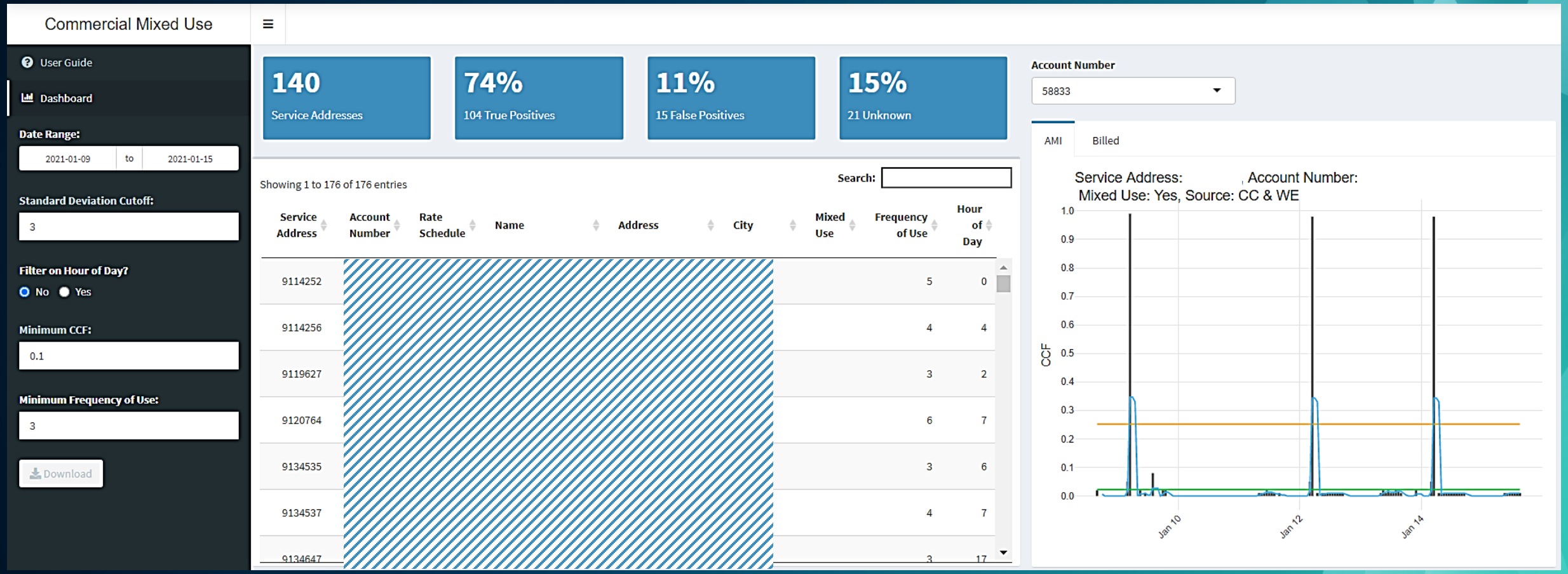
Dashboard



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Summary Statistics and Data Table

140	74%	11%	15%
Service Addresses	104 True Positives	15 False Positives	21 Unknown

Showing 1 to 176 of 176 entries

Search:

Service Address	Account Number	Rate Schedule	Name	Address	City	Mixed Use	Frequency of Use	Hour of Day
9114252							5	0
9114256							4	4
9119627							3	2
9120764							6	7
9134535							3	6
9134537							4	7
9134647							3	17

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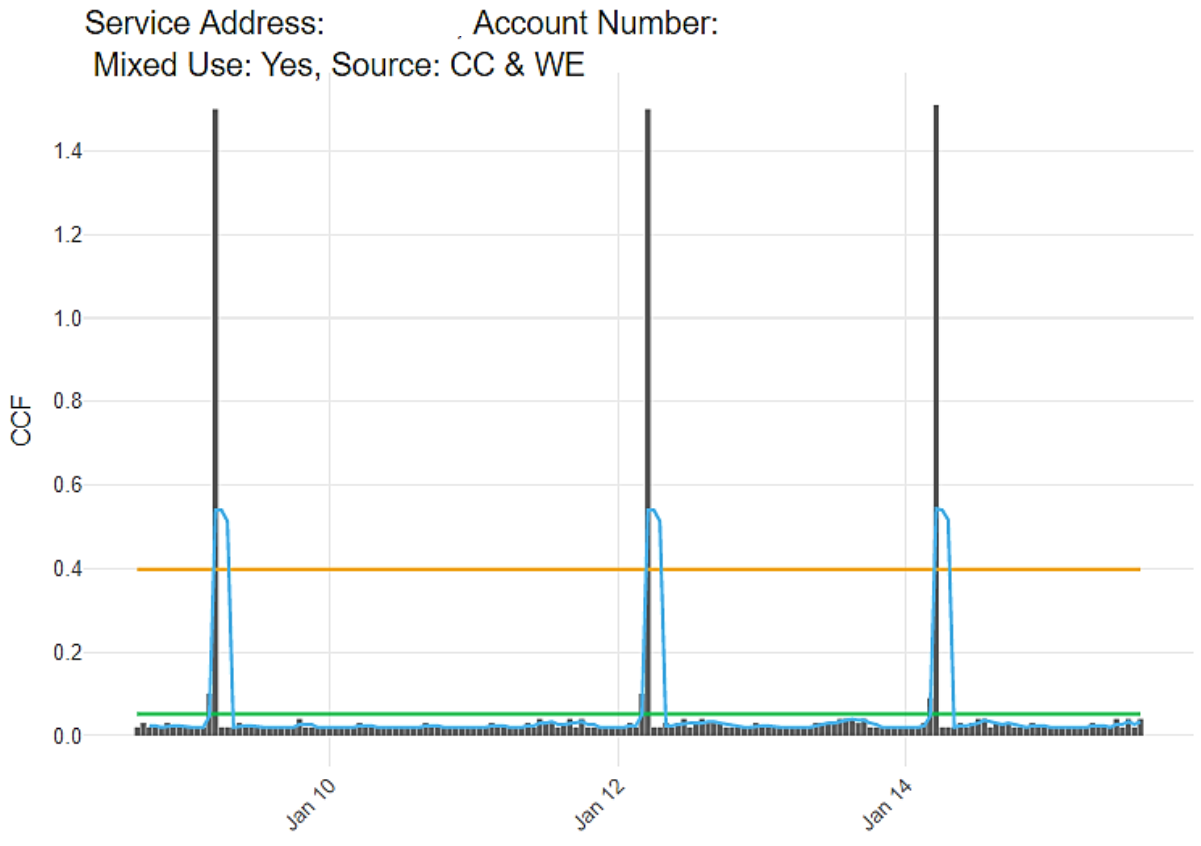
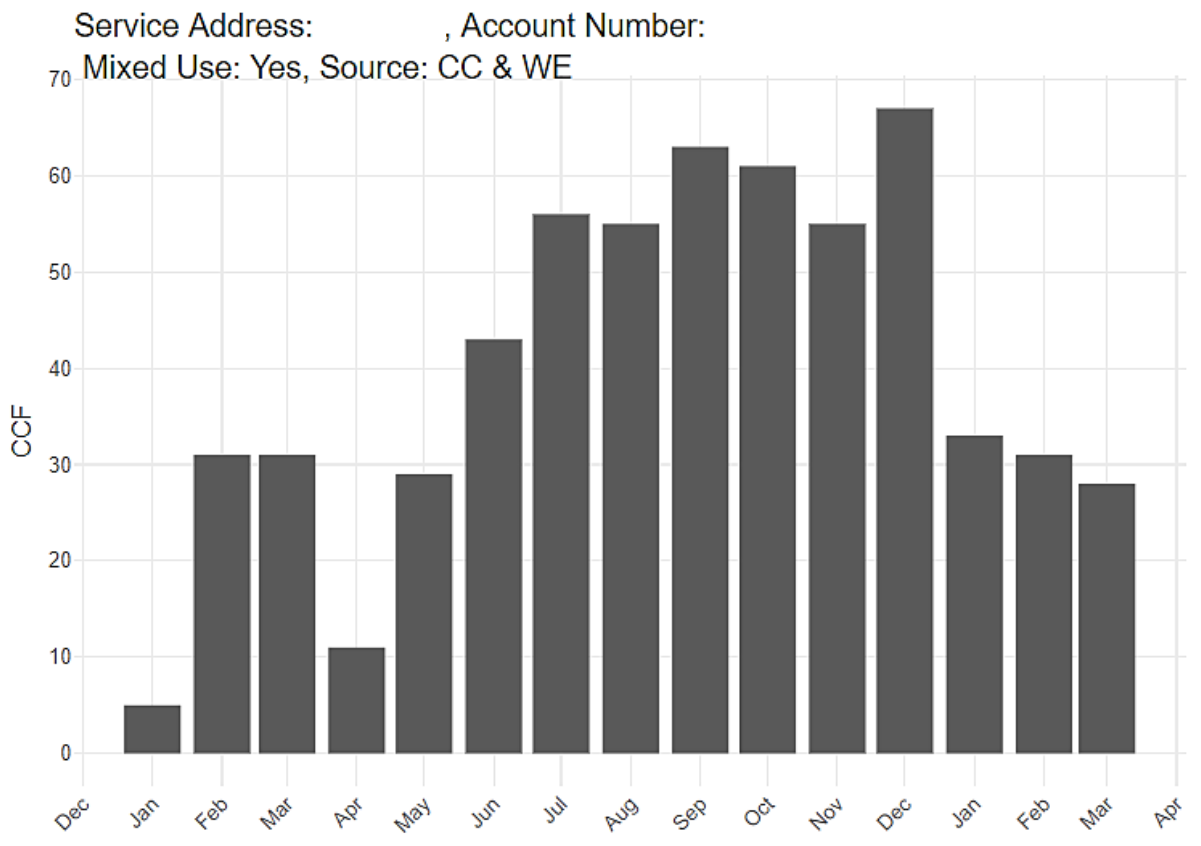
Consumption Data

AMI | Billed



AMI | Billed



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