Certified Level 1 Validation Report, Part A: Validator Provided Details

Validator Provided

Audit Information:

Water Supplier Name: Rubio Cañon Land & Water Association **PWS ID:** 1910140

System Type: Potable **Audit Period:** CY 2019

Utility Representation: Lisa Yamashita-Lopez, General Manager Armando De La Paz, Operations Manager

Validation Date: 9/28/2020 **Call Time:** 14:00 **Sufficient Supporting Documents Provided:** Yes

Validation Findings & Confirmation Statement:

Key Audit Metrics:

Data Validity Score: 74 **Data Validity Band (Level):** Band IV (71 – 90)

ILI: 0.05 **Real Loss:** 0.88 (Gal/conn/day) **Apparent Loss:** 7.46 (Gal/conn/day)

Non-revenue water as percent of cost of operating system: 2.0%

Certification Statement by Validator:

This water loss audit report has been Level 1 validated per the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34.

All recommendations on volume derivation and Data Validity Grades were incorporated into the water audit. ☒

If not, rejected recommendations are included here.

Validator Information:

Water Audit Validator: Justin Bailey, Rubio Cañon Land and Water Association

Qualifications: Water Audit Validator Certificate issued by the CA-NV Section of the AWWA

Certified Level 1 Validation Report, Part B: Utility Provided Details

Utility Provided

Audit Information:

Water Supplier Name: Rubio Cañon Land & Water Association
Water Supplier ID Number: 1910140
Water Audit Period: CY 2019

Water Audit & Water Loss Improvement Steps:

- GIS database and Asset Management System initiated in FY2018, and fully implemented in FY2019
- Hydraulic Model now used for Fire Flow testing reducing "Flushing" volumes by an estimated 300,000 gallons per year.
- New multi-mode (Analog /SCADA) Flow meters installed on VOS Wells in CY2020
- Telemetry volumetric recording of production volumes to be incorporated into SCADA in CY2020

Certification Statement by Utility Executive:

This water loss audit report meets the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34 and has been prepared in accordance with the method adopted by the American Water Works Association, as contained in their manual, *Water Audit and Loss Control Programs, Manual M36, Fourth Edition* and in the Free Water Audit Software version 5.

Executive Name (Print)	Executive Position	Signature	Date
Armando De La Paz	Operations Manager	A. De La Paz	9-30-20

Level 1 Validation Summary Notes

Pre-Interview Notes	Rubio Cañon Land & Water Association is a mutual water company in the unincorporated town of Altadena, California. RCLWA has over 3,100 services and provides water to roughly 9,600 people. More than 1,800 Acre Feet of water was produced and delivered in CY2019. Rubio continues to conduct strict oversight and accounting of all known water uses. All required information and supporting documentation was provided in an organized and timely manner.

Audit Input	Confirmation of Input Derivation	Confirmation of DVG Assignment
Volume from Own Sources (VOS)	**Supply meter profile:** (2) wells provided 88% of the source water and a Surface Water Treatment Plant provided the remaining 12% of all water supplied in 2019. **VOS Input Data Source:** Meter registers are read daily and monthly. Production reports track cumulative production throughout the year. **Comments**: 100% of water entering the system is provided by these own sources. The meters for both production wells are tested volumetrically on an annual basis. **Confirmed input value:** 1832.823 AF	**Percent of VOS metered:** 100% **Signal calibration frequency:** Unknown **Volumetric testing frequency:** Annual for wells **Volumetric testing method:** Timed pumping into isolated reservoir measured against test meter and known storage volume& Compared with pitot tube calculations. **Percent of VOS tested and/or calibrated:** 66% (2 of 3). The treatment plant meter is not annually tested. 88% of VOS water registered by annually tested meters. **Comments:** The volumetric testing for the production wells occurs annually and procedures are well known by staff. **Confirmed DVG:** 7
VOS Master Meter Error Adjustment	**Adjustment Basis:** Annual volumetric testing **Net Storage Change Included:** **Comments:** Input from provided supporting documents was used, in conjunction with tested meter test records; also provided. **Confirmed input value:** -14.609 AF	**Supply meter read frequency:** Daily **Supply meter read method:** Manual Read only **Frequency of data review:** Monthly **Storage level monitoring frequency:** Daily **Comments:** Known meter accuracy % is applied to each recorded monthly registered volume to produce highly accurate actual volumes produced. SCADA was modified to automatically log production totals in 2019, which will be reflected in CY2019 Audit. **Confirmed DVG:** 3

Level 1 Validation Summary Notes

Audit Input	Confirmation of Input Derivation	Confirmation of DVG Assignment
Water Imported (WI)	**Import meter profile: (1) 10"** Rockwell W5500 series Turbo Meter with connected Wholesaler (FMWD) and (2) unknown 4" and 6" emergency interconnections (PW&P). **WI Data Source:** No Water Imported **Comments:** No water was imported through any connections during this audit period. However, the providing Wholesaler, FMWD, has initiated annual volumetric testing of the RCLWA WI meter as of 7/2019. If water is imported in the future, these practices will improve overall accuracy and data validity. **Confirmed input value: 0.0 AF**	**Percent of WI metered:** Unknown **Signal calibration frequency:** Unknown **Volumetric testing frequency:** Unknown **Volumetric testing method:** Timed pumping into isolated reservoir measured against test meter and known storage volume & Compared with pitot tube calculations **Percent of WI tested and/or calibrated:** No water imported in CY2019 **Comments:** None **Confirmed DVG: 7**
WI Master Meter Error Adjustment	**Adjustment Basis:** N/A **Comments:** **Confirmed input value: N/A**	**Import meter read frequency:** **Import meter read method:** **Frequency of data review:** **Comments:** Left blank as not applicable **Confirmed DVG: N/A**
Water Exported (WE)	**Export meter profile:** Compound meters at existing interties between RCLWA and neighboring water agency. (2) 4" to Pasadena Water & Power and (1) 6" to Las Flores Water Co. **WE Data Source:** Meter registers are read weekly during operation and reviewed monthly during billing. Production reports track cumulative production throughout the year. **Comments:** Connections are utilized infrequently and only for precautionary or emergency purposes **Confirmed input value: 0.049 AF**	**Percent of WE metered:** 100% **Signal calibration frequency:** Unknown **Volumetric testing frequency:** Unknown **Volumetric testing method:** Unknown **Percent of WE tested and/or calibrated:** 0% **Comments:** Meters were rehabilitated in 2009 & 2013 **Confirmed DVG: 3**

Level 1 Validation Summary Notes

Audit Input	Confirmation of Input Derivation	Confirmation of DVG Assignment
WE Master Meter Error Adjustment	**Adjustment Basis: N/A** **Comments:** Left blank for lack of test data **Confirmed input value:** N/A	**Export meter read frequency:** Monthly **Export meter read method:** Manual **Frequency of data review:** Monthly **Comments:** None **Confirmed DVG:** N/A
Billed Metered Authorized Consumption (BMAC)	**Customer Meters & Reads Profile:** The customer base is comprised of a mix of service types; 89% single family residential, 7% multi-family residential, & 4% commercial businesses. - **Age profile:** 94% of service meters were replaced in 2013 with the remaining 6% last replaced in 2009. - **Reading system:** Full AMR meter deployment with mobile computer-based radio reading - **Read frequency:** Monthly **Billing Data Pro-rated?** Yes, in the event of meter failure. Historical billing data is utilized to best inform pro-rated billing amount. **Comments:** Includes all metered water sales of **1,811.580 AF** **Confirmed input value:** 1,811.580 AF	**Percent of customers metered:** 100% **Small meter testing policy:** Reactive meter testing based on customer requests or complaints **Number of small meters testing/year:** Unknown **Large meter testing policy:** Reactive meter testing based on customer requests or complaints **Number of large meter tested/year:** Unknown **Meter replacement policy:** Yes. Meter replacement is performed annually. **Number of replacements/year:** 102 meters (3.24%) were replaced in CY2019. **Billing data auditing practice:** Automated billing software w/ monthly in-house auditing and annual 3rd party auditing **Comments:** Meter testing only occurs under limited conditions and is reactive. Meter replacement will increase each year as the average age of the meters progresses beyond the current 5 years overall age. **Confirmed DVG:** 5

Level 1 Validation Summary Notes

Audit Input	Confirmation of Input Derivation	Confirmation of DVG Assignment
Billed Unmetered Authorized Consumption (BUAC)	**Billed Unmetered Profile:** Only (2) sources of BUAC, both operated by LA County Sanitation District via various water trucks. **Input Derivation:** Authorized use report. Registered and estimated volumes are documented as they occur and recorded monthly and annually. **Comments:** Each occurrence is metered or calculated using formulae of time and flow to accurately track volumes. **Confirmed input value:** 0.070 AF	**Policy for metering exemptions:** Strict policy for approval and invoicing are in place. **Comments:** Records are kept updated and available for 3rd party review. "Billed Metered – 2019" spreadsheet provided by RCLWA **Confirmed DVG:** 10
Unbilled Metered Authorized Consumption (UMAC)	**Unbilled Metered Profile:** Monthly AMR readings from Board Members and Association facilities. Actual meter reads from reliable service meters are used. **Input Derivation:** Authorized use report. Registered volumes are recorded monthly and annually. **Comments:** No de-watered reservoirs in CY 2019. Blow off flushing not metered, so volume moved to UUAC. **Confirmed input value:** 3.207 AF	**Policy for billing exemptions:** Strict policy for approval and invoicing are in place. **Comments:** Records are kept updated and available for 3rd party review. "Board Members & Office water usage" 2019 spreadsheet provided by RCLWA **Confirmed DVG:** 10
Unbilled Unmetered Authorized Consumption (UUAC)	**Unbilled Unmetered Profile:** Leak tracking, Operational flushing of dead ends, flushing for water quality sampling, and any reported fire department use. **Input Derivation if Estimated:** Authorized use reports for all listed sources but Fire Dept. Estimated volumes are tracked as they occur and reviewed monthly and annually. UUAC Volume is significantly reduced due to Hydraulic Model being used for Fire Flow Reporting – no longer requiring field flushing for requested Fire Flows. **Comments:** All categories of UUAC imported into single spreadsheet for accurate calculation of total annual volume. **Confirmed input value:** 3.305 AF	**Default or Adjusted Default Applied:** Adjusted default **Completeness of Documentation:** Records are kept updated and available for 3rd party review. "UUAC - 2019" spreadsheet provided by RCLWA **Comments:** Any remaining fire flow volumes and dead end hydrant flushing is monitored and calculated by time and flow formulae to minimize UUAC volumes. An additional (58) 1.8% of customer service connections had Meter-Stops reactively replaced once small leaks were identified **Confirmed DVG:** 10

Level 1 Validation Summary Notes

Audit Input	Confirmation of Input Derivation	Confirmation of DVG Assignment
Unauthorized Consumption (UC)	**Default Applied?** No **Input Derivation if Customized:** Custom input of 0.5 AF utilized **Comments:** Overall Water Loss is minute; 1.58% of WS. With no documented occurrences of UC in CY2019, and proactive staff patrols built into routine patrols, standard default projects unrealistic UC volume. **Confirmed input value: 0.500 AF**	**Instances and extent of UC documented:** None identified. **Comments:** RCLWA has policies and practices in place to actively identify instances of UC. However, since known instances occur so infrequently, no auditable documentation has been put in place to track and query each instance. An auditable form will be created as a recommendation of the Validation process for future reference. **Confirmed DVG: 7**
Customer Metering Inaccuracies (CMI)	**Input Derivation:** See BMAC activities for meter testing and replacement practices. Meter accuracy estimated on average meter age of 6 years. **Comments:** Very good record keeping and tracking exists, and identifies the accurate span of overall meter age. A low inaccuracy % is estimated due to full replacement in 2013 and detailed review of overall water loss metrics and very thorough UUAC tracking. **Confirmed input value: (1.15%) 21.113 AF**	**Characterization of meter testing:** Currently, meter testing only occurs at request of customer or when billing software flags a discrepancy. **Characterization of meter replacement:** Only failed meters or at the customer request. 102 meters replaced in CY2019 (>3% replaced annually, 3.26% in CY2019) **Comments:** complete deployment of AMR metering with automated billing reduces data handling errors and minimizes unregistered sales. **Confirmed DVG:3**
Systematic Data Handling Errors (SDHE)	**Input Derivation:** Computerized billing software and reporting is in place. In house audits of data occur monthly and a 3rd party auditor review takes place annually. **Comments:** Account management practices are reviewed annually by staff. Software automatically flags for zero, hi, and low usage. Rubio is very proactive with field verification, physically confirming >100 "flagged" meter reads are each month. Reports and billing are processed monthly and internal audits of data are performed monthly. 3rd party audits are currently taking place every 3 years. **Confirmed input value: 4.529 AF**	**If custom estimate provided –** Default input utilized for volume only **Characterization of read collection & billing process:** Automated collection with computerized billing software. All flagged usage is manually checked and field verified with extensive records kept. Projections based on broken meters go as far as including data logs of consumption to more accurately project billing data. **Characterization of billing process and billing data auditing:** In house monthly and 3rd party annually. **Confirmed DVG: 9**

Level 1 Validation Summary Notes

Audit Input	Confirmation of Input Derivation	Confirmation of DVG Assignment
Length of Mains	**Input Derivation:** Historic data of pipeline installation contracts, As-Builts, CAD system maps and updated paper maps. **Hydrant lateral length included:** No **Comments:** Base maps and As-Builts are increasingly cross referenced and field verified for accuracy. Sound policies exist for updating by RCLWA staff. Review and cross referencing of maps increased in 2018, but discrepancies and gaps are still known to be present. Correcting these inaccuracies delayed the completion of the GIS database. **Confirmed input value:** 55.0 Miles	**Mapping format:** CAD, GIS, and paper maps + SEDARU asset management software that interfaces with GIS. **Asset management database:** Primarily for accounting purposes. The GIS integration was completed and implemented in CY2019. **Map updates & field validation:** Map updates take place following each project and are a combination of edits both in-house and outsourced to RCLWA engineering consultant (Civiltec Engineering). **Comments:** GIS was approved and began implementation in CY2018. Completion of the GIS and asset management system was completed in CY2019. A Hydraulic Model was also approved and full calibration and testing was completed in June, 2019. **Confirmed DVG:** 5
Number of Active and Inactive Service Connections	**Input Derivation:** Billing software is used to query accurate record of accounts. **Basis for database query:** Account ID or Parcel ID **Comments:** Service area is effectively 'built out' with only small quantities of account activations or deactivations occurring annually. **Confirmed input value:** 3129	**CIS updates & field validation:** Accomplished through normal meter reading process **Estimated error of total count within:** 2% **Comments:** Infrequency of Account activation or deactivation combined with long standing procedures and computerized accounting software produces highly reliable results. Auditing of electronic records takes place by a 3rd party annually. **Confirmed DVG:** 8
Average Length of Customer Service Line	**Are customer meters at the curbstop?** Yes **Where are customer meters installed if not at curbstop? N/A** **Customer service line derivation** **Comments:** Default input grade applied. Customer meters are typically located at the property boundary. **Confirmed input value:** YES	**Comments:** Default input grade applied. Customer meters are typically located at the property boundary. **Confirmed DVG:** 10

Level 1 Validation Summary Notes

Audit Input	Confirmation of Input Derivation	Confirmation of DVG Assignment
Average Operating Pressure	**Number of zones, general setup:** The system has 4 pressure zones, with both VOS producing into a centrally located reservoir system (Maiden Lane). Supplies are diverted from there to the other pressure systems. The available imported water connection is located at the same pumping facility as the (2) RCLWA VOS production Wells, simplifying the operation of introducing imported water to the system. **Typical pressure range:** 20 – 125 psi in general w/ 70 psi average across all pressure zones. **Input derivation:** SCADA telemetry, facility elevations, and monitored system analog pressure gauges **Comments:** Pressure zone integrity is tightly monitored and no valves are left in a position to breech pressure zones. **Confirmed input value: 70 psi**	**Extent of static pressure data collection:** SCADA records basic system pressures while pumps and wells are on or off, allowing static and dynamic pressures to be identified. Hydrant pressures are also recorded during testing / fire flows to further document static and dynamic system pressures **Characterization of real-time pressure data collection:** SCADA telemetry records real time system pressures at all pumping facilities with some temporary pressure gauges capturing pressure data along the distribution system. **Hydraulic model in place?** Yes **Calibrated?:** 6/2019 **Comments:** The Hydraulic Model was completed in CY2019, which will benefit future water loss and audit efforts. **Confirmed DVG: 5**
Total Operating Cost (TOC)	**Input Derivation:** From internal budgeting reports. **Comments:** RCLWA 2019 Annual Report provided for Audit review and validation. **Confirmed input value: $3,225,725 / Year**	**Frequency of internal auditing:** Monthly **Frequency of third-party CPA auditing:** Annually **Comments:** Well-structured cost accounting system is in place with internal review taking place monthly, and 3rd party audit of data occurring annually by Egan & Egan CPA. **Confirmed DVG: 10**
Customer Retail Unit Cost (CRUC)	**Input Derivation:** Internal balancing of tiered rate structure. **Sewer Charges Volumetric?** N/A **Sewer Charges Included?** N/A **Comments:** Tiered rate structure in place and all registered consumption & sales revenues confirmed **Confirmed input value: $4.85 / 100 Cubic Feet**	**Characterization of calculation:** Calculation of metered revenues divided by metered consumption. Input calculations have not been reviewed by an M36 water loss expert. **Comments:** Up to date, tiered rate structure in place and reviewed annually. Most recent cost revisions implemented 6/2019. **Confirmed DVG: 9**

Level 1 Validation Summary Notes

Audit Input	Confirmation of Input Derivation	Confirmation of DVG Assignment
Variable Production Cost (VPC)	**Supply profile:** 100% of water supplied was produced by RCLWA own sources in 2019. **Direct variable costs included:** Gaseous chlorine, supply and distribution power, and water purchase costs **Secondary costs included:** Liability Insurance & Depreciation costs also tracked and accounted for. **Comments:** Cost accounting system in place with well trained staff administering and annual internal + annual 3rd party CPA audits by Egan and Egan. **Confirmed input value:** $934.08 / AF	**Characterization of calculation:** Primary costs and Secondary costs are included in 3rd party CPA Audit. These verified costs are now included in Annual Water Loss Auditing as of CY 2019 **Comments:** Although variable costs are well known and tracked, the input calculations are not reviewed by an M36 water loss expert. **Confirmed DVG:** 7
Pending Items needed to complete the validation	None	