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 2018

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

Validation Date: 9/27/2019 **Call Time:** 14:00 **Sufficient Supporting Documents Provided:** Yes

Validation Findings & Confirmation Statement:

Key Audit Metrics:

Data Validity Score: 68 **Data Validity Band (Level):** Band III (51 – 70)

ILI: 1.25 **Real Loss:** 21.41 (Gal/conn/day) **Apparent Loss:** 9.81 (Gal/conn/day)

Non-revenue water as percent of cost of operating system: 2.9%

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 2018

Water Audit & Water Loss Improvement Steps:

- GIS database and Asset Management System initiated in FY2018, and to be completed in FY2019
- Hydraulic Model approved by RCLWA Board, and to be completed in CY2019
- Additional volumetric meter testing to be conducted in 2019
- Telemetry accounting of production volumes to be incorporated into SCADA modifications in CY2019

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	9-29-19

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 1,900 Acre Feet of water was produced and delivered in CY2018. 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 96.5% of the source water and a Surface Water Treatment Plant provided the remaining 3.5% of all water supplied in 2018. **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: **2023.570 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. 96.5% 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 supporting documents provided was used, in conjunction with tested meter test records; also provided. Confirmed input value: **-21.780 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:** Unknown **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:** None in CY2018 **Comments:** None Confirmed DVG: **5**
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 daily 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: **0.061 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; 92% single family residential, 5% multi-family residential, & 3% 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 laptop-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 1928.050 AF Confirmed input value: **1928.050 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:** 93 meters (3.0%) were replaced in CY2018. **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:** Some registered and unregistered use provided to LA County Sanitation District and various water trucks. **Input Derivation:** Authorized use report. Registered and estimated volumes are recorded monthly and annually. **Comments:** Each occurrence is metered or calculated using formulae of time and flow to accurately track volumes. Confirmed input value: **0.320 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 – 2018" spreadsheet provided by RCLWA Confirmed DVG: **10**
Unbilled Metered Authorized Consumption (UMAC)	**Unbilled Metered Profile:** Construction or temporary meters used to accurately record Blow-Off flushing and reservoir dewatering. **Input Derivation:** Authorized use report. Registered volumes are recorded monthly and annually. **Comments:** Each occurrence is metered or calculated using formulae of time and flow to accurately to accurately record UMAC volumes. Confirmed input value: **2.395 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. "Blow Offs & Reservoir Maintenance - 2018" spreadsheet provided by RCLWA Confirmed DVG: **10**
Unbilled Unmetered Authorized Consumption (UUAC)	**Unbilled Unmetered Profile:** Operational flushing and fire department use. **Input Derivation if Estimated:** Records of Flushing volumes & frequency **Comments:** Default of 0.25% x WS volume utilized due to reduced quantity and duration of operational discharges. Confirmed input value: **5.113AF**	**Default or Adjusted Default Applied:** Adjusted default **Completeness of Documentation:** Records kept of estimated frequency and volumes **Comments:** All fire flow volumes and hydrant flushing are monitored and calculated by time and flow formulae to minimize UUAC volumes. DVG score increased above default due to policy because records of blow off and hydrant flushing volumes results in less operational practices to estimate. Confirmed DVG: **6**

Level 1 Validation Summary Notes

Audit Input	Confirmation of Input Derivation	Confirmation of DVG Assignment
Unauthorized Consumption (UC)	**Default Applied?** Yes **Input Derivation if Customized:** Default input utilized **Comments:** All suspicious activities are investigated and active efforts are built into routine patrols to guard against UC. Confirmed input value: **5.113 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 this validation for continuous documentation and future reference. Confirmed DVG: **5**
Customer Metering Inaccuracies (CMI)	**Input Derivation:** See BMAC activities for meter testing and replacement practices. Meter accuracy estimated on average meter age of 5 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 manufacturer provided meter performance. Confirmed input value: **(1.25%) 24.436 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. Roughly 90 meters replaced in CY2018 (3% replaced annually) **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. 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: **4.820 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. **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 and paper maps + Spacial Wave asset management software. **Asset management database:** Primarily for accounting purposes. The GIS integration was not completed in CY2018 **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 in CY2019. 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 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 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 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?** No **Calibrated?:** N/A **Comments:** The approved Hydraulic Model will be completed in CY2019, which will benefit future water loss and audit efforts. Confirmed DVG: **4**
Total Operating Cost (TOC)	**Input Derivation:** From internal budgeting reports. **Comments:** RCLWA 2018 Annual Report provided for Audit review and validation. Confirmed input value: **$3,124,933 / 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. 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 confirmed costs limited to water only. Confirmed input value: **$3.55 / 100 Cubic Feet**	**Characterization of calculation:** Calculation of volumetric charges 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 6/2018. Weighted average unable to be confirmed, limiting DVG to 5 Confirmed DVG: **5**

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 2018. **Direct variable costs included:** Gaseous chlorine, supply and distribution power, and purchase costs **Secondary costs included:** None **Comments:** Cost accounting system in place with well trained staff administering and annual internal + annual 3rd party CPA audits. **Confirmed input value: $448.29 / AF**	**Characterization of calculation:** Primary costs only. Secondary costs are known but have not yet been included into this calculation, and reviewed by the annual audit process. **Comments:** Although variable costs are well known and tracked, the input calculations do not yet include depreciation costs and are not reviewed by an M36 water loss expert. **Confirmed DVG: 4**
Pending Items needed to complete the validation	None	