

Level 1 Validation Summary Notes/Certificate

This document includes detailed notes about utility practices as reviewed during third-party level-one water audit validation.



Call Information

Utility

System Name: Kaanapali (205)

Audit Period: CY2022

System Participants: Julian Gandara, Stephen Green, Hawaii Water Service

Call Date: 6/23/2023

Validator

Validator: Neal Fujii, Nicholas Ing

Validator Qualifications: Equivalent to AWWA CA-NV Level 1 Validator Certification

Validator General Comments: Comparing CY2021 with CY2022, Water Supplied increased 25 MG, Authorized Consumption increased 161 MG, Real Losses decreased 146 MG.

Kaanapali noted that a large 8" service line leak was discovered in 2021 and repaired in 2022. Kaanapali is also replacing small customer meters based on AWWA M6 manual, and replaced a 1.5 MG reservoir in 2022.

Kaanapali is developing water budgets for its larger customers and updating its conservation master plan as part of a PUC rate case and developed tiered block rates for its residential customers.

Validators recommend that Kaanapali begin to test their production meters and large customer meters, conduct a leak detection survey, and consider establishing DMAs in suspected high-leak areas. Since Kaanapali wells are in a newly established Commission on Water Resource Management designated water management area, efforts to reduce real losses will be scrutinized by CWRM.

Past Year's Activity:

Data Management

- System staff completed an AWWA water audit and a Level-1 water audit validation.
- Continues customer meter replacement program.

Loss Recovery

- System staff have responded to and repaired reported leaks in the system during the audit period.
- Customer meters are replaced based on age and consumption as per M6 guidelines.
- In late 2022 an 8" Cla-Val PRV was replaced at Puukoolii road.
- Kaanapali has a semi-annual PRV maintenance program.
- Large 8" service line leak at Whaler's Village discovered in April 2022 and repaired in 2022.
- In October 2022, 1.5 MG reservoir float control valve was replaced.

Opportunities:

Data Management

- Staff are in the process of developing a Geographic Information System (GIS). Based upon additional insight from the GIS build-out, the entry for miles of mains can be refined.
- Kaanapali will be converting their AMI vendor to Badger/Beacon in 2023; Kaanapali is already 95% AMI and priority is to convert other non-AMI Hawaii Water Service systems to AMI.
- Kaanapali will be replacing its well production meter with turbine meters in 2023.

Loss Recovery

- Data management activities will take priority at this time.
- Leak detection program may be implemented based on results of a pilot leak detection project in another system (Kalaeloa/Barbers Point, Oahu).

Selected Metrics & Signatures:

Metric	Units	Value
Miles of Mains		42.0 [41.5]
Count of Service Connections		768 [731]
Variable Production Cost	\$/MG	\$2,107 [\$1,840]
Customer Retail Unit Cost	\$/kgal	\$5.23 [\$4.82]
Real Losses per Connection per Day	gal/conn/day	-
Real Losses per Mile of Main	gal/mile/day	3,798 [13,496]
Cost of Real Losses per Mile of Main	\$/mile/yr	-
Infrastructure Leakage Index	Ratio	N/A
Apparent Losses per Connection per Day	gal/conn/day	120 [90]
Cost of Apparent Losses per Connection	\$/conn/yr	-

Validator Signature:  Name: Neal Fujii

Utility Executive Signature:  Name: Julian Gandara

[bracketed values represent previous audit period]

Validation Call Notes

Audit Input	Grade	Audit Input Notes	Data Validity Grade Notes
Volume from Own Sources	3	<p>Source Meter Profile: There are two well fields that serve the Ka'anapali system. The meters in the well fields (totalling 9 wells) have been replaced in the last seven years (six of them installed in 2015).</p> <p>Derivation: SCADA reads from production meters as archived.</p> <p>Comments: Input derivation from supporting documents confirmed. Exclusion of non-potable volumes confirmed.</p>	<p>Approximate Percent of Volume Metered: 100%</p> <p>Approximate Percent Tested and/or Calibrated: 0%</p> <p>Calibration Frequency: None.</p> <p>Volumetric Testing Frequency: None.</p> <p>Volumetric Testing Method: n/a.</p> <p>Comments: Installed meter boxes to conduct comparative meter testing in the future.</p>

Volume from Own Sources Master Meter and Supply Error Adjustment	3	<p>Derivation: Left blank in absence of available test data.</p> <p>Change in Storage Considered: No.</p> <p>Comments: Storage volume in system is ~5.3 MG. Change in storage volumes are unlikely to impact audit volumes. In 2022 a 1.5 MG reservoir was rebuilt.</p>	<p>Source Meter Read Method: Automatic logging via SCADA telemetry.</p> <p>Source Meter Read Frequency: Meter is manually read every day and a monthly totalization was used to determine the production volume.</p> <p>Data Review Practices: Monthly.</p> <p>Real-Time Storage Level Monitoring: Yes.</p> <p>Comments:</p>
Water Imported	n/a	<p>Import Meter Profile: n/a</p> <p>Derivation: n/a</p> <p>Comments: n/a</p>	<p>Approximate Percent of Volume Metered: n/a</p> <p>Approximate Percent Tested and/or Calibrated: n/a</p> <p>Calibration Frequency: n/a</p> <p>Volumetric Testing Frequency: n/a</p> <p>Volumetric Testing Method: n/a</p> <p>Comments: n/a</p>
Water Imported Master Meter and Supply Error Adjustment	n/a	<p>Derivation: n/a</p> <p>Comments: n/a</p>	<p>Import Meter Read Method: n/a</p> <p>Import Meter Read Frequency: n/a</p> <p>Data Review Practices: n/a</p> <p>Comments: n/a</p>
Water Exported	n/a	<p>Export Meter Profile: n/a</p> <p>Comments: n/a</p>	<p>Approximate Percent of Volume Metered: n/a</p> <p>Approximate Percent Tested and/or Calibrated: n/a</p> <p>Calibration Frequency: n/a</p> <p>Volumetric Testing Frequency: n/a</p> <p>Volumetric Testing Method: n/a</p> <p>Comments: n/a</p>
Water Exported Master Meter and Supply Error Adjustment	n/a	<p>Derivation: n/a</p> <p>Comments: n/a</p>	<p>Export Meter Read Method: n/a</p> <p>Export Meter Read Frequency: n/a</p> <p>Data Review Practices: n/a</p> <p>Comments: n/a</p>

Billed Metered Authorized Consumption	6	<p>Derivation: Customers are mostly residential, but there are also large hotels and commercial uses in the system. The small customer meters are Badgers and the large customer meters are Sensus.</p> <p>Customer Meter Profile: Select</p> <p>Read Frequency: Continuous, with monthly bill frequency.</p> <p>Reading Technology: AMI.</p> <p>Age Profile: The large meters have been replaced in the last 5-7 years. The small meters are of unknown age. There is an ongoing meter replacement program.</p> <p>Comments: There have been some issues with signal strength with the AMI meters which were corrected in 2021. Lag-time correction is not employed in input derivation. Input derivation from supporting documents confirmed. Exclusion of non-potable volumes confirmed</p>	<p>Approximate Percent Metered: 100%</p> <p>Small Meter Testing Practices: Reactive - complaint based or flagged-consumption testing only.</p> <p>Number of Small Meters Tested: n/a</p> <p>Large Meter Testing Practices: None.</p> <p>Number of Large Meters Tested: n/a</p> <p>General Replacement Practices: Based on an age threshold as per CA PUC guidelines and M6 for smaller meters and AWWA M6 or large meters.</p> <p>Billing Data Review: Unknown</p> <p>Comments: Approximately 3 large customer meters (4") were replaced in 2021.</p>
Billed Unmetered Authorized Consumption	n/a	<p>Profile: n/a</p> <p>Derivation: n/a</p> <p>Comments: Select</p>	<p>Policy for Metering Exemptions: n/a</p> <p>Comments: n/a</p>
Unbilled Metered Authorized Consumption	n/a	<p>Profile: n/a</p> <p>Derivation: n/a</p> <p>Comments: There is a meter installed at the base yard but it is not being read. Water use at the base yard is limited to indoor uses and some vehicle washing – probably a small volume of consumption. Kaanapali believes that the meter is for a 1" pipe and is unsure if it is AMI.</p>	<p>Policy for Billing Exemptions: Limited to own facilities.</p>
Unbilled Unmetered Authorized Consumption	5	<p>Profile: Operational flushing and fire department usage and baseyard use.</p> <p>Comments: No additional comments.</p>	<p>Comments: Hawaii default grade applied- and value is applied based on county and large capacity systems as suggested by validator (RS).</p>
Unauthorized Consumption	5	<p>Comments: Default input applied.</p>	<p>Comments: Default grade applied.</p>
Customer Metering Inaccuracies	3	<p>Derivation: Rudimentary estimate.</p> <p>Comments: Select</p> <p>*See BMAC comments regarding meter testing & replacement activities.</p>	<p>Customer Meter Testing: Limited (upon request AND consumption flag only).</p> <p>Customer Meter Replacement: Routine (proactive), but limited.</p> <p>Comments: No additional comments.</p>
Systematic Data Handling Errors	5	<p>Comments: Default input applied.</p>	<p>Comments: Default grade applied.</p>

Length of Mains	7	<p>Derivation: Hydraulic model.</p> <p>Hydrant Laterals Included: No.</p> <p>Comments: Hydrant lateral length, but not service lateral length should be included in the total length of mains. Mainlines are asbestos concrete pipe and ductile iron. Most main failures are caused by corrosion or abrasion leaks. Service connections are most likely copper. There are an unknown number of service connection failures per year. A GIS system is being developed.</p>	<p>Map Format: Digital.</p> <p>Asset Management Systems: In place but separate from GIS system.</p> <p>Map Update Process: Unknown</p> <p>Comments: Master plan update ongoing, including the hydraulic model.</p>
Number of Service Connections	9	<p>Derivation: Standard report run from billing system.</p> <p>Basis for Query: Account, meter, and location ID.</p> <p>Comments: Staff estimated that the pipes used for the service connections are mostly made from copper. The number of breaks among service connections within a year are unknown. The number of service connections includes both active and inactive connections. There are some service connections with more than one meter.</p>	<p>Field Validation: Accomplished through normal meter reading processes.</p> <p>Estimate of Error: 1%.</p> <p>Comments: The service connection count includes active and inactive connections.</p>
Average Operating Pressure	3	<p>How Pressure is Maintained: Well water is pumped to tanks and the system is gravity fed.</p> <p>Pressure Range: 77 psi</p> <p>Derivation: Output from hydraulic model.</p> <p>Comments: No additional comments.</p>	<p>Pressure Data Collection: Not collected currently.</p> <p>Real-Time Monitoring: No real-time monitoring currently in place.</p> <p>Hydraulic Model: In place and calibrated within the last 7 years.</p> <p>Comments: No additional comments.</p>
Annual Operating Cost	10	<p>Derivation: From official financial reports.</p> <p>Comments: Confirmed costs limited to water only, and water debt service included</p>	<p>Auditing Practices: Annually by a third party CPA.</p> <p>Comments: No additional comments.</p>
Customer Retail Unit Cost	9	<p>Rate Structure: Simple flat rate</p> <p>Derivation: Simple rate structure with only a single volumetric rate.</p> <p>Comments: No additional comments. Kaanapali is developing a tiered rate schedule for its residential customers.</p>	<p>M36 Review: Input calculations have not been reviewed by an M36 water loss expert.</p> <p>Comments: No additional comments.</p>
Variable Production Cost	5	<p>Primary Costs: Own sources only.</p> <p>Secondary Costs: None currently included.</p> <p>Comments: Power and chemicals.</p>	<p>M36 Review: Primary costs only. Input calculations have not been reviewed by an M36 water loss expert.</p> <p>Comments: No additional comments.</p>