ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

For

NZTA OTAGO QLDC RAMM DATABASE AND TRUSTPOWER

Prepared by: Rebecca Elliot

Date audit commenced: 15 January 2021

Date audit report completed: 3 March 2021

Audit report due date: 08 April 2021

TABLE OF CONTENTS

Executive summary 3
Audit summary 4

Non-compliances 4
Recommendations 6
Issues 6

1. Administrative 7

1.1. Exemptions from Obligations to Comply with Code 7
1.2. Structure of Organisation 7
1.3. Persons involved in this audit 8
1.4. Hardware and Software 8
1.5. Breaches or Breach Allegations 8
1.6. ICP Data 8
1.7. Authorisation Received 8
1.8. Scope of Audit 9
1.9. Summary of previous audit 10
1.10. Distributed unmetered load audits (Clause 16A.26 and 17.295F) 10

2. DUML database requirements 11

2.1. Deriving submission information (Clause 11(1) of Schedule 15.3) 11
2.2. ICP identifier and items of load (Clause 11(2)(a) and (aa) of Schedule 15.3) 12
2.3. Location of each item of load (Clause 11(2)(b) of Schedule 15.3) 13
2.4. Description and capacity of load (Clause 11(2)(c) and (d) of Schedule 15.3) 13
2.5. All load recorded in database (Clause 11(2A) of Schedule 15.3) 13
2.6. Tracking of load changes (Clause 11(3) of Schedule 15.3) 14
2.7. Audit trail (Clause 11(4) of Schedule 15.3) 15

3. Accuracy of DUML database 16

3.1. Database accuracy (Clause 15.2 and 15.37B(b)) 16
3.2. Volume information accuracy (Clause 15.2 and 15.37B(c)) 21

Conclusion 24

Participant response 25

EXECUTIVE SUMMARY

This audit of the **NZTA Otago (NZTA) Queenstown Lakes District council** DUML database and processes was conducted at the request of **Trustpower Limited (Trustpower)** in accordance with clause 15.37B. The purpose of this audit is to verify that the volume information is being calculated accurately, and that profiles have been correctly applied.

The audit was conducted in accordance with the audit guidelines for DUML audits version 1.1.

There are three ICPs associated with the NZTA Otago streetlights. Trustpower were reconciling all three from the data provided by Aurora but decided after the last audit to separate ICP 0000027638CECB5 to resolve the issue identified where there was a communication problem between two different maintenance contractors maintaining separate databases, so this ICP is now reconciled using the QLDC RAMM database. This is the first audit of the QLDC database for this ICP. The audit for the Aurora NZTA Otago database is expected to be submitted at the same time as this audit.

The RAMM database is managed by QLDC. New Connection work is notified by NZTA to QLDC. McKay Electrical have been engaged by NZTA to do the streetlighting maintenance for the Queenstown Lakes DC area.

Examination of both databases found that there are approximately 30 lamps recorded in both databases. The QLDC RAMM database has 30 lamps associated with ICP 0000027638CECB5 (Franklin NSP). The Aurora database has 36 lamps against ICP 0000486695CE506 (Cromwell NSP). It is likely that the light count is correct in the QLDC database, but this needs to be confirmed. These lights are being fed from the Cromwell NSP and not the Franklin NSP and therefore these are being submitted against the wrong ICP in the QLDC database. I recommend in both audits that these lights are investigated to confirm which database they should be recorded in. These are being submitted twice and will be resulting in an estimated annual over submission of 19,818 kWh.

Trustpower reconciles this DUML load using the STL profile. The on and off times are derived from data logger information. Trustpower receives a monthly wattage report.

In absolute terms, total annual consumption is estimated to be 11,8000 kWh higher than the DUML database indicates.

In absolute terms, total annual consumption is estimated to be 11,8000 kWh higher than the DUML. The audit found three non-compliances and makes two recommendations. The future risk rating of 12 indicates that the next audit be completed in 12 months. I have considered this in conjunction with Trustpower's comments and agree with this recommendation.

The matters raised are detailed below:

AUDIT SUMMARY

NON-COMPLIANCES

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Deriving submission information	2.1	11(1) of Schedule 15.3	Approximately 30 lamps in Wanaka submitted against the incorrect ICP. Approximately 30 lamps in Wanaka recorded in two databases and therefore submitted twice resulting in an estimated over submission of approximately 19,818 kWh per annum. The database is not confirmed as accurate with a 95% level of confidence with a potential over submission of approximately 11,800 kWh per annum. Newly connected streetlights are included for the whole month and not the date of electrical connection.	Moderate	Medium	4	Investigating

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Database accuracy	3.1	15.2 and 15.37B(b)	The database is not confirmed as accurate with a 95% level of confidence with a potential under submission of approximately 11,800 kWh per annum. LED lights recorded with insufficient descriptions to confirm lamp wattage. Approximately 30 lamps in Wanaka submitted against the incorrect ICP. Approximately 30 lamps in Wanaka recorded in two databases and therefore submitted twice resulting in an estimated over submission of approximately 19,818 kWh per annum.	Moderate	Medium	4	Investigating
Volume information accuracy	3.2	15.2 and 15.37B(c)	Approximately 30 lamps in Wanaka submitted against the incorrect ICP. Approximately 30 lamps in Wanaka recorded in two databases and therefore submitted twice resulting in an estimated over submission of approximately 19,818 kWh per annum. The database is not confirmed as accurate with a 95% level of confidence with a potential over submission of approximately 11,800 kWh per annum. Newly connected streetlights are included for the whole month and not the date of electrical connection.	Moderate	Medium	4	Investigating

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Future Risk Rating						12	

Future risk rating	0	1-4	5-8	9-15	16-18	19+
Indicative audit frequency	36 months	24 months	18 months	12 months	6 months	3 months

RECOMMENDATIONS

Subject	Section	Recommendation
Database Accuracy	3.1	Work with QLDC and McKay Electrical to provide LED light details.
		Determine the correct database and ICP for the NZTA lights in Wanaka and surrounds.

ISSUES

Subject	Section	Description	Issue
		Nil	

1. ADMINISTRATIVE

1.1. Exemptions from Obligations to Comply with Code

Code reference

Section 11 of Electricity Industry Act 2010.

Code related audit information

Section 11 of the Electricity Industry Act provides for the Electricity Authority to exempt any participant from compliance with all or any of the clauses.

Audit observation

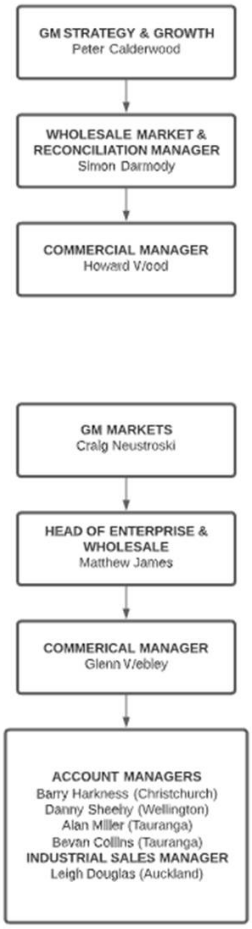
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

Audit commentary

There are no exemptions in place relevant to the scope of this audit.

1.2. Structure of Organisation

Trustpower provided a copy of their organisational structure.



1.3. Persons involved in this audit

Auditor:

Name	Company	Role
Rebecca Elliot	Veritek Limited	Lead Auditor
Claire Stanley	Veritek Limited	Supporting Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Robbie Diederen	Reconciliation Analyst	Trustpower
Roger Hughes	Contract Data Engineer	Queenstown Lakes District Council

1.4. Hardware and Software

The SQL database used for the management of DUML is remotely hosted by RAMM Software Ltd. The database is commonly known as "RAMM" which stands for "Roading Asset and Maintenance Management".

QLDC confirmed that the database back-up is in accordance with standard industry procedures. Access to the database is secure by way of password protection.

Systems used by the trader to calculate submissions are assessed as part of their reconciliation participant audits.

1.5. Breaches or Breach Allegations

There are no breach allegations relevant to the scope of this audit.

1.6. ICP Data

ICP Number	Description	NSP	Profile	Number of items of load	Database wattage (watts)
0000027638CECB5	Central Otago State Highways FKN0331	FKN0331	STL	348	47,694

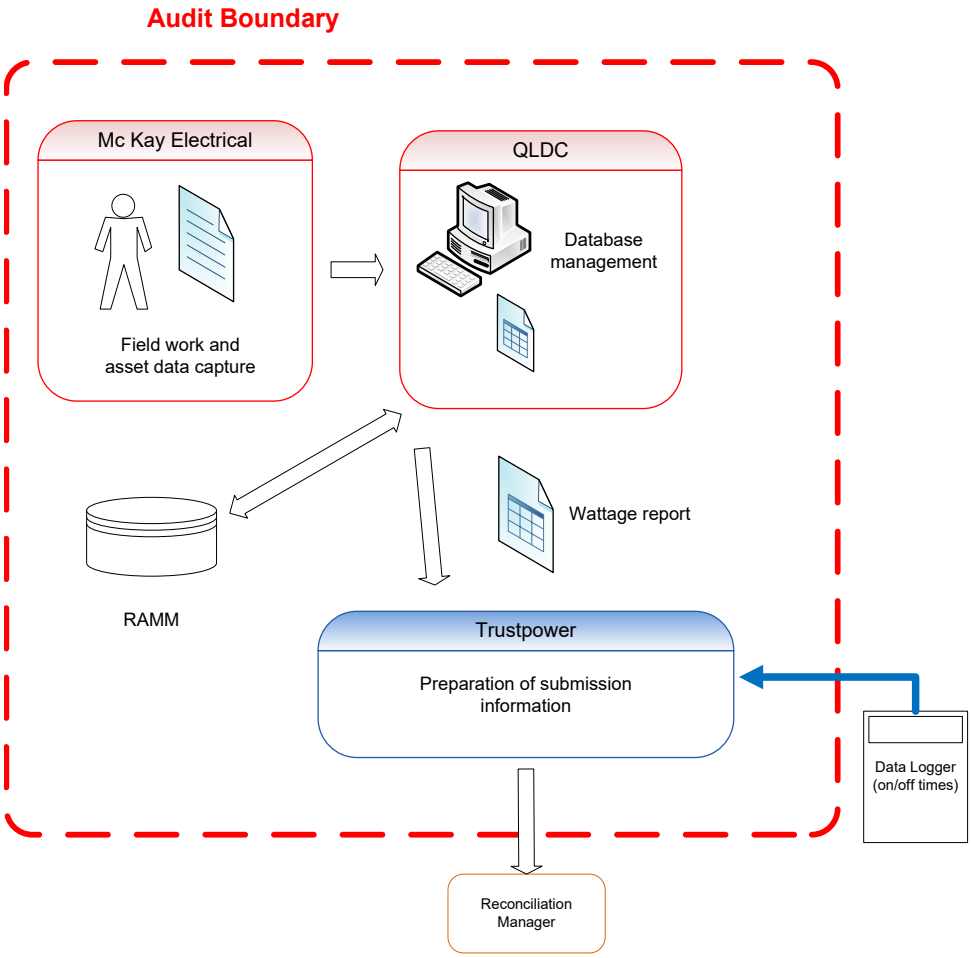
1.7. Authorisation Received

All information was provided directly by Trustpower and QLDC.

1.8. Scope of Audit

The database is managed by Queenstown Lakes DC and the data is held in RAMM. McKay Electrical have been engaged by NZTA to do the streetlighting maintenance for the Queenstown Lakes DC area.

The scope of the audit encompasses the collection, security and accuracy of the data, including the preparation of submission information based on the database reporting. The diagram below shows the audit boundary for clarity.



The audit was carried out at on 27th January 2021. The field audit was undertaken of 101 lights using the statistical sampling methodology.

1.9. Summary of previous audit

This is the first audit on this database. The data was being reconciled using Aurora data previously. The data for ICP 0000027638CECB5 is now provided by QLDC.

1.10. Distributed unmetered load audits (Clause 16A.26 and 17.295F)

Code reference

Clause 16A.26 and 17.295F

Code related audit information

Retailers must ensure that DUML database audits are completed:

1. *by 1 June 2018 (for DUML that existed prior to 1 June 2017)*
2. *within three months of submission to the reconciliation manager (for new DUML)*
3. *within the timeframe specified by the Authority for DUML that has been audited since 1 June 2017.*

Audit observation

Trustpower have requested Veritek to undertake this streetlight audit.

Audit commentary

This audit report confirms that the requirement to conduct an audit has been met for this database within the required timeframe.

Audit outcome

Compliant

2. DUML DATABASE REQUIREMENTS

2.1. Deriving submission information (Clause 11(1) of Schedule 15.3)

Code reference

Clause 11(1) of Schedule 15.3

Code related audit information

The retailer must ensure the:

- *DUML database is up to date*
- *methodology for deriving submission information complies with Schedule 15.5.*

Audit observation

The process for calculation of consumption was examined.

Audit commentary

Trustpower reconciles this DUML load using the STL profile. The on and off times are derived from data logger information. Trustpower receives a monthly wattage report.

I recalculated the submissions for December 2020 using the data logger and the database information. I confirmed that the calculation method was correct and accurate. The kW figure used by Trustpower matches the kW figure in the database extract provided by QLDC.

Examination of both databases found that there are approximately 30 lamps recorded in both databases. The QLDC RAMM database has approximately 30 lamps associated with ICP 0000027638CECB5 (Franklin NSP). The Aurora database has 36 lamps against ICP 0000486695CE506 (Cromwell NSP). It is likely that the light count is correct in the QLDC database, but this needs to be confirmed. These lights are being fed from the Cromwell NSP and not the Franklin NSP and therefore these are being submitted against the wrong ICP in the QLDC database. I recommend in both audits that these lights are investigated to confirm which database they should be recorded in. These are being submitted twice and will be resulting in an estimated annual over submission of 19,818 kWh.

The field audit against the database quantities found that the database is not confirmed as accurate with a 95% level of confidence resulting in an estimated over submission of 11,800 kWh per annum. This is detailed in **section 3.1**.

On 18 June 2019, the Electricity Authority issued a memo confirming that the code requirement to calculate the correct monthly load must:

- take into account when each item of load was physically installed or removed, and
- wash up volumes must take into account where historical corrections have been made to the DUML load and volumes.

The monthly report is now being provided with changes made through the month. The database contains a “light date added” and a “lamp date changed” but there is not a field for “livening date” for newly connected lights. Therefore, Trustpower is calculating the load for light changes compliantly but cannot for newly connected lights as these will be calculated as present for the whole month and not the date of installation. Revisions are completed where corrections are required. The inability to track newly connected lights from date of electrical connection is recorded as non-compliant.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: Unknown To: 20-Jan-21	Approximately 30 lamps in Wanaka submitted against the incorrect ICP. Approximately 30 lamps in Wanaka recorded in two databases and therefore submitted twice resulting in an estimated over submission of approximately 19,818 kWh per annum. The database is not confirmed as accurate with a 95% level of confidence with a potential over submission of approximately 11,800 kWh per annum. Newly connected streetlights are included for the whole month and not the date of electrical connection. Potential impact: Medium Actual impact: Medium Audit history: None Controls: Moderate Breach risk rating: 4
Audit risk rating	**Rationale for audit risk rating**
Medium	The controls are rated as moderate as processes to manage change capture most changes. The impact is assessed to be medium, based on the database inaccuracies detailed above.

Actions taken to resolve the issue	Completion date	Remedial action status
We are investigating to see if the issue is valid or not.	01/06/2021	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
This will depend on what the investigation uncovers	To be advised	

2.2. ICP identifier and items of load (Clause 11(2)(a) and (aa) of Schedule 15.3)

Code reference

Clause 11(2)(a) and (aa) of Schedule 15.3

Code related audit information

The DUML database must contain:

- *each ICP identifier for which the retailer is responsible for the DUML*
- *the items of load associated with the ICP identifier.*

Audit observation

The database was checked to confirm an ICP is recorded for each item of load.

Audit commentary

All items of load had an ICP recorded as required by this clause.

Audit outcome

Compliant

2.3. Location of each item of load (Clause 11(2)(b) of Schedule 15.3)

Code reference

Clause 11(2)(b) of Schedule 15.3

Code related audit information

The DUML database must contain the location of each DUML item.

Audit observation

The database was checked to confirm the location is recorded for all items of load.

Audit commentary

The database contains either the nearest street address and Global Positioning System (GPS) coordinates for each item of load and users in the office and field can view these locations on a mapping system.

Audit outcome

Compliant

2.4. Description and capacity of load (Clause 11(2)(c) and (d) of Schedule 15.3)

Code reference

Clause 11(2)(c) and (d) of Schedule 15.3

Code related audit information

The DUML database must contain:

- *a description of load type for each item of load and any assumptions regarding the capacity*
- *the capacity of each item in watts.*

Audit observation

The database was checked to confirm that it contained a field for lamp type and wattage capacity and included any ballast or gear wattage and that each item of load had a value recorded in these fields.

Audit commentary

The database contains two records for wattage, firstly the lamp wattage and secondly the gear wattage, which represents ballast losses. All were populated.

The accuracy of these details is discussed in s**ection 3.1**.

Audit outcome

Compliant

2.5. All load recorded in database (Clause 11(2A) of Schedule 15.3)

Code reference

Clause 11(2A) of Schedule 15.3

Code related audit information

The retailer must ensure that each item of DUML for which it is responsible is recorded in this database.

Audit observation

The field audit was undertaken of a statistical sample of 101 items of load.

Audit commentary

The field audit was accurate for all, but the following items detailed in the table below:

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
47 BALLARAT STREET(EAST)	1	0	-1		1 x 101W LED was recorded in the database but not located in the field.
FRANKTON SHOPPING CENTRE STREET	4	4	-2		1 x 150W MH and 1 x 70W MH recorded in the database and located in field - confirmed owner is QLDC not NZTA. These belong to a different ICP.
STATE HIGHWAY 84	20	20		10	1 x 100W MH recorded in database but 250W HPS located in the field. 5 x 100W HPS recorded in database but 5 x 150W HPS located in field. 1 x 100W HPS recorded in database but 1 x 102W LED located in field. 2 x 100W HPS recorded in the dataset but 2 x 250W HPS located in the field.
SH84/ARDMORE ROUNDABOUT	2	2		1	1 x 150W HPS recorded in the database but 1 x 250W HPS located in the field.
Grand Sample Total	**101**	**98**	**-3**	**11**	

One item of load was not found in the field and two items of load were recorded against the incorrect ICP so are excluded from this database. No additional lights were found in the field therefore compliance is confirmed. The overall database accuracy is detailed in **section 3.1**.

Audit outcome

Compliant

2.6. Tracking of load changes (Clause 11(3) of Schedule 15.3)

Code reference

Clause 11(3) of Schedule 15.3

Code related audit information

The DUML database must track additions and removals in a manner that allows the total load (in kW) to be retrospectively derived for any given day.

Audit observation

The process for tracking of changes in the database was examined.

Audit commentary

The RAMM database functionality achieves compliance with the code. The change management process and the compliance of the database reporting provided to Trustpower is detailed in **sections 3.1** and **3.2**.

Audit outcome

Compliant

2.7. Audit trail (Clause 11(4) of Schedule 15.3)

Code reference

Clause 11(4) of Schedule 15.3

Code related audit information

The DUML database must incorporate an audit trail of all additions and changes that identify:

- *the before and after values for changes*
- *the date and time of the change or addition*
- *the person who made the addition or change to the database*

Audit observation

The database was checked for audit trails.

Audit commentary

The RAMM database contain a complete audit trail of all additions and changes including the identifier of person who makes any changes.

Audit outcome

Compliant

3. ACCURACY OF DUML DATABASE

3.1. Database accuracy (Clause 15.2 and 15.37B(b))

Code reference

Clause 15.2 and 15.37B(b)

Code related audit information

Audit must verify that the information recorded in the retailer's DUML database is complete and accurate.

Audit observation

The DUML Statistical Sampling Guideline was used to determine the database accuracy. The table below shows the survey plan.

Plan Item	Comments
Area of interest	NZTA Otago lights on the Aurora network (QLDC)
Strata	The database contains items of load Otago Aurora network area. The area has two distinct sub-groups of urban and rural. The processes for the management of NZTA Aurora Otago items of load are the same, but I decided to place the items of load into three geographical strata, as follows: 1. Frankton 2. Queenstown 3. Small towns
Area units	I created a pivot table of the roads in each area, and I used a random number generator in a spreadsheet to select a total of 22 sub-units.
Total items of load	101 items of load were checked.

Wattages were checked for alignment with the published standardised wattage table produced by the Electricity Authority against the database or in the case of LED lights against the LED light specification.

The change management process and timeliness of database updates was evaluated.

Audit commentary

A field audit was conducted of a statistical sample of 101 items of load. The "database auditing tool" was used to analyse the results, which are shown in the table below.

Result	Percentage	Comments
The point estimate of R	105.8	Wattage from survey is higher than the database wattage by 5.8%
R_L	90.3	With a 95% level of confidence, it can be concluded that the error could be between -9.6% and 10.3%
R_H	110.3	

These results were categorised in accordance with the "Distributed Unmetered Load Statistical Sampling Audit Guideline", effective from 1 February 2019. The table below shows that Scenario B (detailed below) applies, and the database has poor accuracy, demonstrated with statistical significance to conclude that the database is accurate within ±5.0%.

- The variability of the sample results across the strata means that the true wattage (installed in the field) could be between -9.6% lower and 10.3% higher than the wattage recorded in the DUML database.
- In absolute terms the installed capacity is estimated to be 3 kW lower than the database indicates.
- There is a 95% level of confidence that the installed capacity is between 5 kW lower and 5 kW higher than the database.
- In absolute terms, total annual consumption is estimated to be 11,800 kWh higher than the DUML database indicates.
- There is a 95% level of confidence that the annual consumption is between 19,700 kWh lower to 21,000 kWh p.a. higher than the database indicates.

Scenario	**Description**
A - **Good accuracy, good precision**	This scenario applies if: (a) R_H is less than 1.05; and (b) R_L is greater than 0.95 The conclusion from this scenario is that: (a) the best available estimate indicates that the database is accurate within +/- 5 %; and (b) this is the best outcome.
B - **Poor accuracy, demonstrated with statistical significance**	This scenario applies if: (a) the point estimate of R is less than 0.95 or greater than 1.05 (b) as a result, either R_L is less than 0.95 or R_H is greater than 1.05. There is evidence to support this finding. In statistical terms, the inaccuracy is statistically significant at the 95% level
C - **Poor precision**	This scenario applies if: (a) the point estimate of R is between 0.95 and 1.05 (b) R_L is less than 0.95 and/or R_H is greater than 1.05 The conclusion from this scenario is that the best available estimate is not precise enough to conclude that the database is accurate within +/- 5 %

Lamp description and capacity accuracy

Wattages for all items of load were checked against the published standardised wattage table produced by the Electricity Authority in the database and found all wattages were correct.

All ballast details are correct.

The lamp description is in the 'Description" field and contains sufficient information for non-LED lights. For example, "150W HP Sodium streetlight" is sufficient to denote this is a High-Pressure Sodium streetlight with a capacity of 150 watts. LED lights are recorded as "LED" or as "Light Emitting Diode" with the wattage. This is not sufficient to confirm that the correct wattage is being applied. The recommended format for the field is: *Cree;Ledway;60LED;525mA;100W:*

Field	Description
Manufacturer	For example, "Cree"
Model	For example, "Ledway"
Number of LEDS	One make and model of light may have many different variants with different LED quantities. Ledway, for example, have between 20 and 120 LEDs.
Driver	This is the LED power supply and different drivers result in different power outputs.
Wattage	The rated wattage

QLDC are reliant on McKay Electrical to populate these details. I recommend that Trustpower work with QLDC to get this information populated.

Description	Recommendation	Audited party comment	Remedial action
Database Accuracy	Work with QLDC and McKay Electrical to provide LED light details.	We will undertake Auditor's recommendation	Identified

This is recorded as non-compliance below.

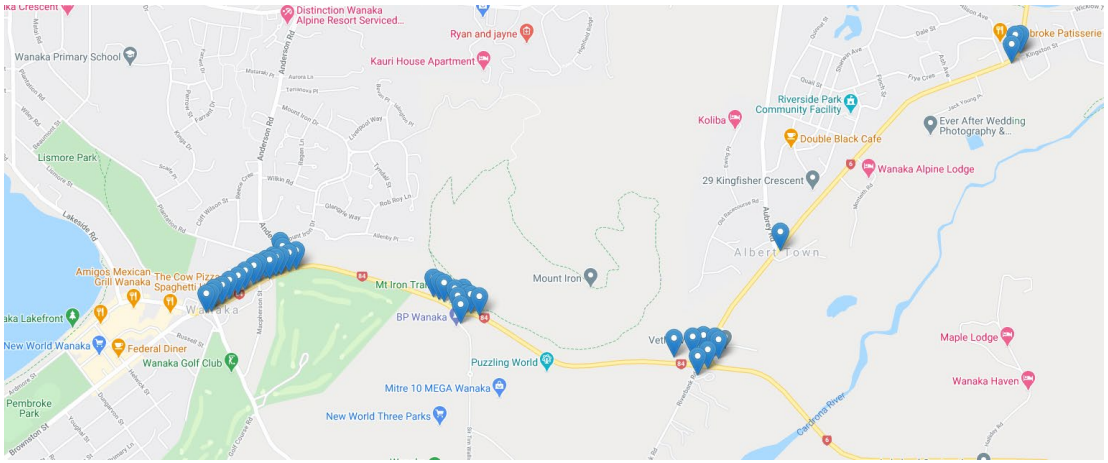
Address accuracy

There were no issues found with location information.

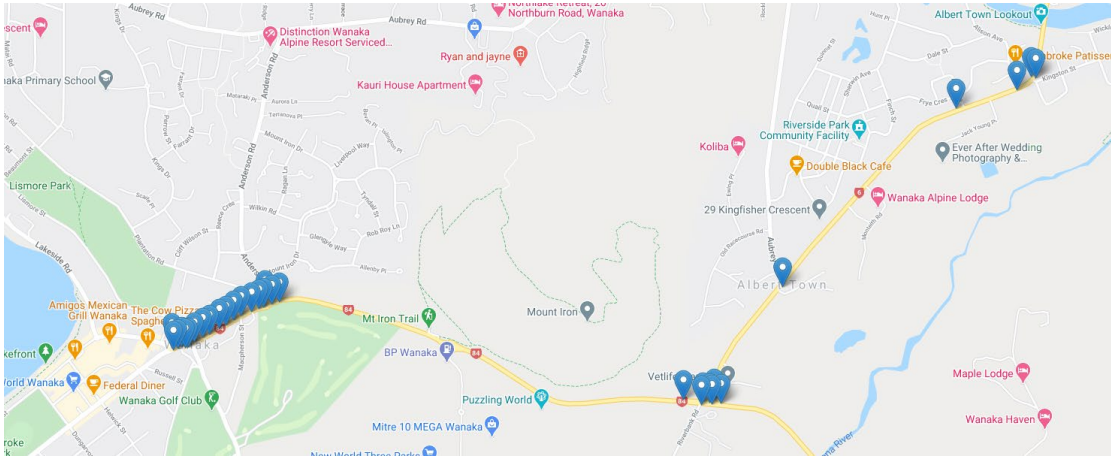
ICP number and owner accuracy

Examination of both databases found that there are approximately 30 lamps recorded in both databases. The QLDC RAMM database has 30 lamps associated with ICP 0000027638CECB5 (Franklin NSP). The Aurora database has 36 lamps against ICP 0000486695CE506 (Cromwell NSP). It is likely that the light count is correct in the QLDC database, but this needs to be confirmed. These lights are being fed from the Cromwell NSP and not Franklin NSP and therefore these are being submitted against the wrong ICP in the QLDC database. I recommend in both audits that these lights are investigated to confirm which database they should be recorded in. These are being submitted twice and will be resulting in an estimated annual over submission of 19,818 kWh.
I have included a GPS plot of the lights in each database for reference:

NZTA Aurora database



QLDC RAMM database



Description	Recommendation	Audited party comment	Remedial action
Database accuracy	Determine the correct database and ICP for the NZTA lights in Wanaka and surrounds.	We are investigating to see if the issue is valid or not	Investigating

Change management process findings

The processes were reviewed for new lamp connections and the tracking of load changes due to faults and maintenance.

The database contains an "install date", but if data entry occurs after the monthly report has been run, the items of load will only appear in the report for the next month and revisions do not occur. When a wattage is changed in the database due to a physical change or a correction, only the record present at the time the report is run is recorded, not the historical information showing dates of changes.

The database is managed by QLDC and the data is held in their RAMM system.

McKay Electrical is the contractor for QLDC, McKay update changes directly into the RAMM database for maintenance and repairs.

Details for all new connections are provided by the Aurora NZTA Project Manager to the Contract Data Engineer at QLDC to update into the RAMM database.

No festive lighting is connected to the Aurora NZTA unmetered streetlight network.

A monthly submission report is provided by QLDC to Trustpower, Aurora Energy and Powernet.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: Unknown To: 20-Jan-21	The database is not confirmed as accurate with a 95% level of confidence with a potential under submission of approximately 11,800 kWh per annum. LED lights recorded with insufficient descriptions to confirm lamp wattage. Approximately 30 lamps in Wanaka submitted against the incorrect ICP. Approximately 30 lamps in Wanaka recorded in two databases and therefore submitted twice resulting in an estimated over submission of approximately 19,818 kWh per annum. Potential impact: Medium Actual impact: Medium Audit history: None Controls: Moderate Breach risk rating: 4
Audit risk rating	**Rationale for audit risk rating**
Medium	The controls are rated as moderate as controls will mitigate risk most of the time. The impact is assessed to be medium, based on the kWh differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
We are investigating to see if the issue is valid or not	01/06/2021	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
This will depend on what the investigation uncovers	To be advised	

3.2. Volume information accuracy (Clause 15.2 and 15.37B(c))

Code reference

Clause 15.2 and 15.37B(c)

Code related audit information

The audit must verify that:

- *volume information for the DUML is being calculated accurately*
- *profiles for DUML have been correctly applied.*

Audit observation

The submission was checked for accuracy for the month the database extract was supplied. This included:

- checking the registry to confirm that all ICPs have the correct profile and submission flag, and
- checking the database extract combined with the burn hours against the submitted figure to confirm accuracy.

Audit commentary

Trustpower reconciles this DUML load using the STL profile. The on and off times are derived from data logger information. Trustpower receives a monthly wattage report.

I recalculated the submissions for December 2020 using the data logger and the database information. I confirmed that the calculation method was correct and accurate. The kW figure used by Trustpower matches the kW figure in the database extract provided by QLDC.

Examination of both databases found that there are approximately 30 lamps recorded in both databases. The QLDC RAMM database has approximately 30 lamps associated with ICP 0000027638CECB5 (Franklin NSP). The Aurora database has 36 lamps against ICP 0000486695CE506 (Cromwell NSP). It is likely that the light count is correct in the QLDC database, but this needs to be confirmed. These lights are being fed from the Cromwell NSP and not the Franklin NSP and therefore these are being submitted against the wrong ICP in the QLDC database. I recommend in both audits that these lights are investigated to confirm which database they should be recorded in. These are being submitted twice and will be resulting in an estimated annual over submission of 19,818 kWh.

The field audit against the database quantities found that the database is not confirmed as accurate with a 95% level of confidence resulting in an estimated over submission of 11,800 kWh per annum. This is detailed in **section 3.1**.

On 18 June 2019, the Electricity Authority issued a memo confirming that the code requirement to calculate the correct monthly load must:

- take into account when each item of load was physically installed or removed, and
- wash up volumes must take into account where historical corrections have been made to the DUML load and volumes.

The monthly report is now being provided with changes made through the month. The database contains a “light date added” and a “lamp date changed” but there is not a field for “livening date” for newly connected lights. Therefore, Trustpower is calculating the load for light changes compliantly but cannot for newly connected lights as these will be calculated as present for the whole month and not the date of installation. Revisions are completed where corrections are required. The inability to track newly connected lights from date of electrical connection is recorded as non-compliant.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: Unknown To: 20-Jan-21	Approximately 30 lamps in Wanaka submitted against the incorrect ICP. Approximately 30 lamps in Wanaka recorded in two databases and therefore submitted twice resulting in an estimated over submission of approximately 19,818 kWh per annum. The database is not confirmed as accurate with a 95% level of confidence with a potential over submission of approximately 11,800 kWh per annum. Newly connected streetlights are included for the whole month and not the date of electrical connection. Potential impact: Medium Actual impact: Medium Audit history: None Controls: Moderate Breach risk rating: 4
Audit risk rating	**Rationale for audit risk rating**
Medium	The controls are rated as moderate as processes to manage change capture most changes. The impact is assessed to be medium, based on submission inaccuracies indicated by the DUML audit tool.

Actions taken to resolve the issue	Completion date	Remedial action status
We are investigating to see if the issue is valid or not	01/06/2021	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
This will depend on what the investigation uncovers	To be advised	

CONCLUSION

There are three ICPs associated with the NZTA Otago streetlights. Trustpower were reconciling all three from the data provided by Aurora but decided after the last audit to separate ICP 0000027638CECB5 to resolve the issue identified where there was a communication problem between two different maintenance contractors maintaining separate databases, so this ICP is now reconciled using the QLDC RAMM database. This is the first audit of the QLDC database for this ICP. The audit for the Aurora NZTA Otago database is expected to be submitted at the same time as this audit.

The RAMM database is managed by QLDC. New Connection work is notified by NZTA to QLDC. McKay Electrical have been engaged by NZTA to do the streetlighting maintenance for the Queenstown Lakes DC area.

Examination of both databases found that there are approximately 30 lamps recorded in both databases. The QLDC RAMM database has 30 lamps associated with ICP 0000027638CECB5 (Franklin NSP). The Aurora database has 36 lamps against ICP 0000486695CE506 (Cromwell NSP). It is likely that the light count is correct in the QLDC database, but this needs to be confirmed. These lights are being fed from the Cromwell NSP and not the Franklin NSP and therefore these are being submitted against the wrong ICP in the QLDC database. I recommend in both audits that these lights are investigated to confirm which database they should be recorded in. These are being submitted twice and will be resulting in an estimated annual over submission of 19,818 kWh.

Trustpower reconciles this DUML load using the STL profile. The on and off times are derived from data logger information. Trustpower receives a monthly wattage report.

In absolute terms, total annual consumption is estimated to be 11,8000 kWh higher than the DUML. The audit found three non-compliances and makes two recommendations. The future risk rating of 12 indicates that the next audit be completed in 12 months. I have considered this in conjunction with Trustpower's comments and agree with this recommendation.

Participant response

We are investigating with the contractors if the issue of the 30 lights identified by the Auditor is correct.

Until this investigation is completed, we are unable to confirm if this is an issue or not. Unfortunately, the person managing the database is away on sick leave and we have not yet had a response from them.

The contractor managing the database is following good processes and this issue has not been identified in past audits.