

**ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT**

For

**NZTA OTAGO QLDC RAMM DATABASE
AND TRUSTPOWER
NZBN: 9429038917912**

Prepared by: Rebecca Elliot

Date audit commenced: 30 November 2021

Date audit report completed: 4 February 2022

Audit report due date: 08 February 2022

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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.

The database is remotely hosted by thinkproject New Zealand Limited. The RAMM database is managed by QLDC. QLDC provide a monthly report to Trustpower of this database. Trustpower reconciles the DUML load using the STL profile. Wattages are derived from a RAMM database extract. On and off times are derived from a data logger.

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.

An issue was raised in the last audit report that identified approximately 30 lamps recorded in the NZTA database against ICP 0000027638CECB5, that were also recorded against ICP0000486695CE506. This was investigated by QLDC, and these have been removed from the database in November 2021. No revisions of the duplicated lights have been made resulting in an estimated over submission for the available 14 month revision period of 23,120 kWh.

Further investigation identified a further 31 lamps that were incorrectly recorded against ICP 0000027638CECB5 (NSP FKN0331) and should have been recorded against ICP 0000486695CE506 (NSP CML0331). These have been removed and added to the correct ICP in November 2021. This is also discussed in the NZTA Otago Aurora DUML audit report. These ICPs are in different balancing areas so this will impact submission accuracy. No revisions been carried out to correct the volumes incorrectly submitted against ICP 0000027638CECB5 for the available 14 month revision period resulting in an estimated 17,103 kWh of submission against the ICP and therefore the incorrect balancing area.

The field audit was undertaken of a statistical sample of 126 items of load was undertaken on the 28th and 29th January 2022. This found that the database is not within the allowable +/-5% accuracy threshold and over submission is likely to be occurring as a result:

- in absolute terms the installed capacity is estimated to be 2 kW lower than the database indicates,
- there is a 95% level of confidence that the installed capacity is 4 kW lower than the database,
- in absolute terms, total annual consumption is estimated to be 9,900 kWh lower than the DUML database indicates, and
- there is a 95% level of confidence that the annual consumption is between 18,000 kWh to 4,000 kWh p.a. lower than the database indicates.

The audit found four non-compliances and makes one recommendation. The future risk rating of 14 indicates that the next audit be completed in 12 months. I have considered this in conjunction with Trustpower's responses and recommend that the next audit be in 12 months.

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	<p>Revisions not carried out for duplicated lights resulting in an estimated over submission of 23,121 kWh over the available 14 month revision period.</p> <p>Revisions not carried out to correct the volumes for the available 14 month revision period resulting in approximately 17,103 kWh of submission against the incorrect balancing area.</p> <p>The database is not confirmed as accurate with a 95% level of confidence with a potential under submission of approximately be 9,900 kWh per annum.</p>	Moderate	Medium	4	Investigating
All load recorded in the database	2.5	Clause 11(2A) of Schedule 15.3	Five additional lights were found in the field.	Moderate	Low	2	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)	<p>The database is not confirmed as accurate with a 95% level of confidence with a potential under submission of approximately be 9,900 kWh per annum.</p> <p>Revisions not carried out for duplicated lights resulting in an estimated over submission of 23,121 kWh over the available 14 month revision period.</p> <p>Revisions not carried out to correct the volumes for the available 14 month revision period resulting in approximately 17,103 kWh of submission against the incorrect balancing area.</p> <p>LED lights recorded with insufficient descriptions to confirm lamp wattage.</p>	Moderate	Medium	4	Identified
Volume information accuracy	3.2	15.2 and 15.37B(c)	<p>Revisions not carried out for duplicated lights resulting in an estimated over submission of 23,121 kWh over the available 14 month revision period.</p> <p>Revisions not carried out to correct the volumes for the available 14 month revision period resulting in approximately 17,103 kWh of submission against the incorrect balancing area.</p> <p>The database is not confirmed as accurate with a 95% level of confidence with a potential under submission of approximately be 9,900 kWh per annum.</p>	Moderate	Medium	4	Investigating
Future Risk Rating						14	

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	Continue to work with QLDC and McKay Electrical to provide LED light details.

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

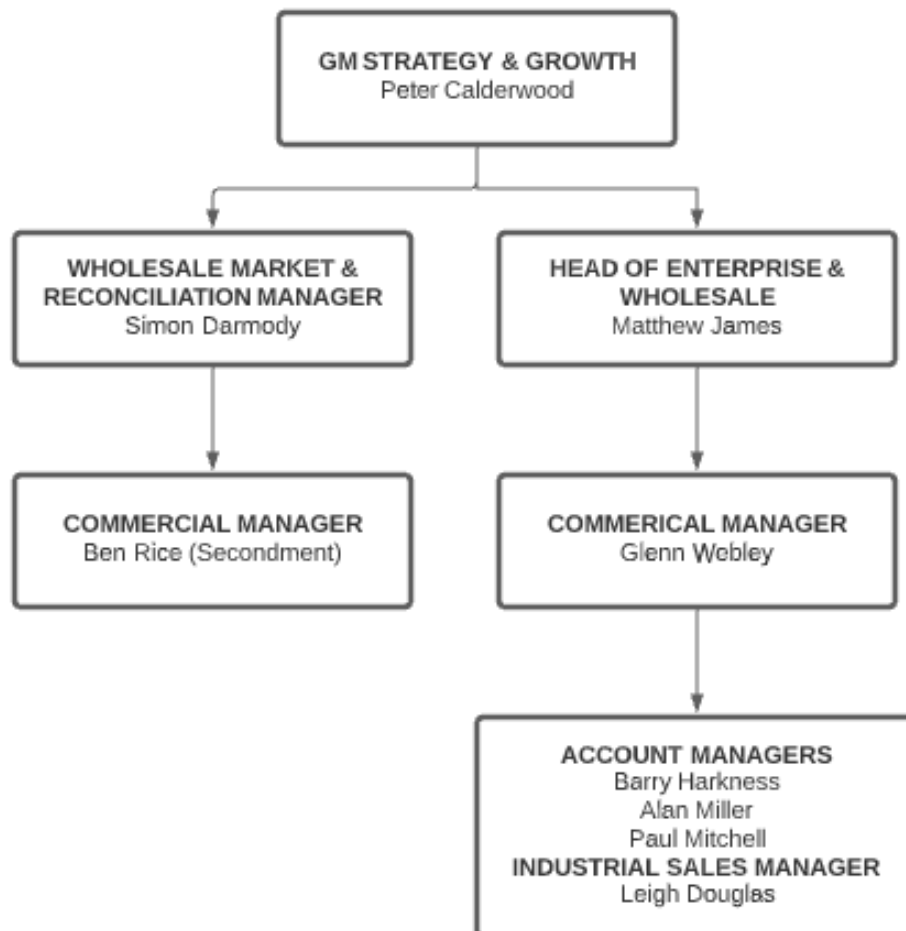
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

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 Diederer	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 thinkproject New Zealand Limited. The database is commonly known as "RAMM" which stands for "Road Assessment and Maintenance Management". The specific data used for DUML is held in the Streetlight tables. thinkproject New Zealand Limited backs up the database and assists with disaster recovery as part of their hosting service.

Pocket RAMM is used in the field by McKay Electrical.

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	326	42,134

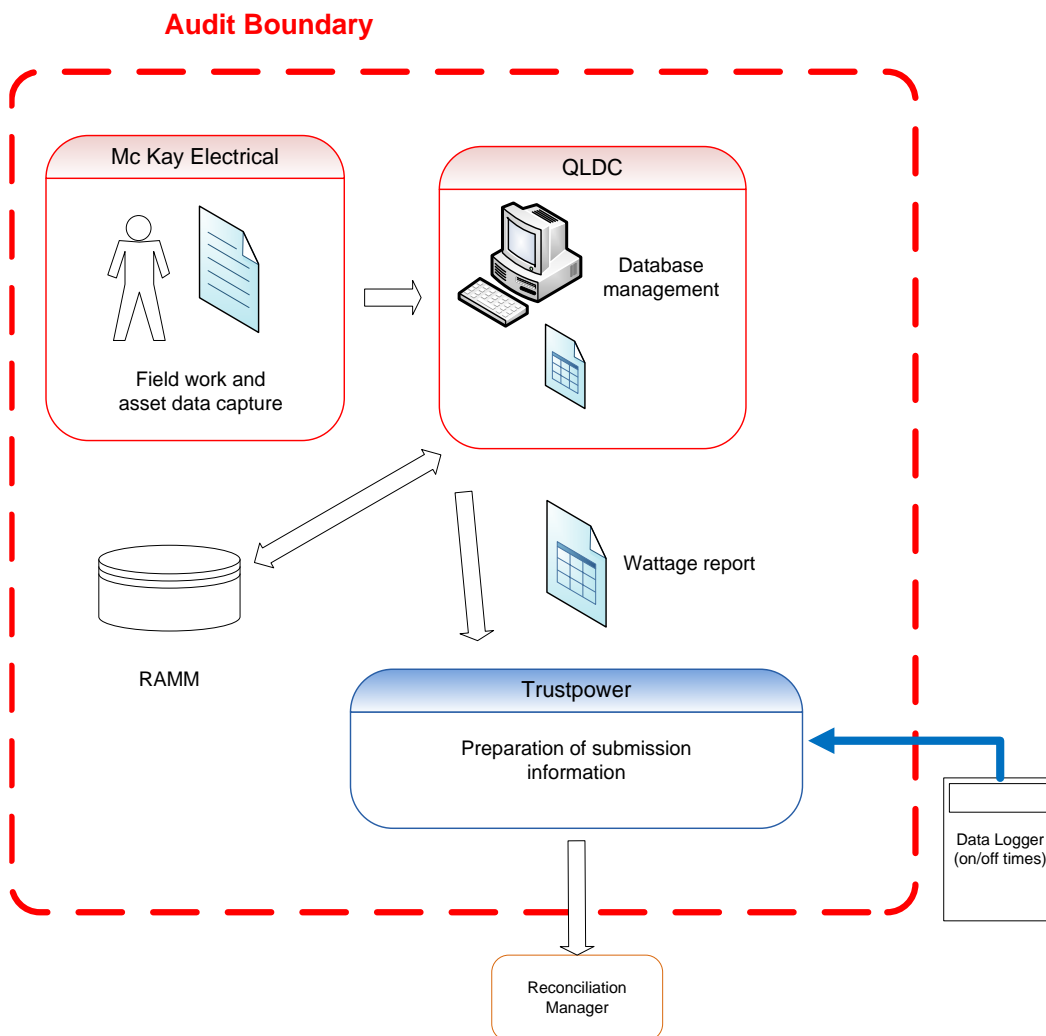
1.7. Authorisation Received

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. Pocket RAMM is used in the field to issue work and record changes in the field, the results are captured directly into RAMM.

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 field audit was undertaken of a statistical sample of 126 items of load on the 28th and 29th January 2022.

1.9. Summary of previous audit

The previous audit was completed in March 2021 by Rebecca Elliot of Veritek Limited. That audit found three non-compliances and made two recommendations. The current status of that audit's findings is detailed below:

Table of Non-Compliance

Subject	Section	Clause	Non-Compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	Approximately 30 lamps in Wanaka submitted against the incorrect ICP.	Cleared
			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.	Cleared
			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.	Still exiting
			Newly connected streetlights are included for the whole month and not the date of electrical connection.	Cleared
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.	Still exiting
			LED lights recorded with insufficient descriptions to confirm lamp wattage.	Still existing for some lamps
			Approximately 30 lamps in Wanaka submitted against the incorrect ICP.	Cleared
			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.	Cleared
Volume information accuracy	3.2	15.2 and 15.37B(c)	Approximately 30 lamps in Wanaka submitted against the incorrect ICP.	Cleared
			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.	Cleared
			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.	Still existing
			Newly connected streetlights are included for the whole month and not the date of electrical connection.	Still existing

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

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. Wattages are derived from a database extract Trustpower receives monthly.

I recalculated the submissions for November 2021 using the data logger and the database information. I confirmed that it was calculated accurately based on the database and data logger information.

An issue was raised in the last audit report that identified approximately 30 lamps recorded in the NZTA database against ICP 0000027638CECB5, that were also recorded against ICP0000486695CE506. This was investigated by QLDC, and these have been removed from the database in November 2021. No revisions of the duplicated lights have been made resulting in an estimated over submission for the available 14 month revision period of 23,120 kWh.

Further investigation identified a further 31 lamps that were incorrectly recorded against ICP 0000027638CECB5 (NSP FKN0331) and should have been recorded against ICP 0000486695CE506 (NSP CML0331). These have been removed and added to the correct ICP in November 2021. This is also discussed in the NZTA Otago Aurora DUML audit report. These ICPs are in different balancing areas so this will impact submission accuracy. No revisions been carried out to correct the volumes incorrectly submitted against ICP 0000027638CECB5 for the available 14 month revision period resulting in an estimated 17,103 kWh of submission against the incorrect ICP and therefore the incorrect balancing area.

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 under submission of 9,900 kWh per annum. This is detailed in **section 3.1**.

The monthly report is provided with changes made through the month. The database contains a "light date added" and a "lamp date changed".

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 21-Jan-21 To: 30-Nov-21	Revisions not carried out for duplicated lights resulting in an estimated over submission of 23,121 kWh over the available 14 month revision period. Revisions not carried out to correct the volumes for the available 14 month revision period resulting in approximately 17,103 kWh of submission against the incorrect balancing area. The database is not confirmed as accurate with a 95% level of confidence with a potential over submission of approximately 9,900 kWh per annum. Potential impact: Medium Actual impact: Medium Audit history: Once 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 due to the impact on submission.		
Actions taken to resolve the issue		Completion date	Remedial action status
Trustpower is endeavouring to establish an accurate lamp count and as adjustments are made these are included in any revisions that are submitted. Unfortunately, due to the nature of this DUML and the parties involved, this process often takes longer than the Revision timeframe. Trustpower will continue to work with the parties to improve the accuracy of the DUML database and will submit the most accurate information we have available for all revisions.		31 March 2022	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	
Investigating		30 November 2022	

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 DUMML database must contain the location of each DUMML item.

Audit observation

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

Audit commentary

The database contains the Global Positioning System (GPS) for all items of load which meets the requirements of this clause.

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 DUMML 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

Lamp type description, lamp wattage and ballast wattage are included in the database. Examination of the database found this was populated for all items of load. The accuracy of this is examined in **section 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 126 items of load on the 28th and 29th January 2022.

Audit commentary

The field audit discrepancies are detailed in the table below:

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
SH 6 roundabout by Lucas Place			+4	7	4 additional 150W HPS found in the field 7 x 100W HPS recorded in the database but 7 x 150W HPS found in the field
SH 6 near Hansen Rd				2	2 x 100W HPS recorded in the database but 2 x 150W HPS found in the field
SH 6 near Arrowtown Lake Hayes Rd				1	1 x 137W LED recorded in the database but 1 x 163W LED found in the field
SH 6 near Gray St			+1		1 x 100W HPS found in the field
Grand Sample Total	326	331	+5	10	

The field audit found five additional lights in the field. This is recorded as non-compliance below.

The accuracy of the database is discussed in **section 3.1**.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3 From: 21-Jan-21 To: 30-Nov-21	Five additional lights were found in the field. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2		
Audit risk rating	Rationale for audit risk rating		
Low	The controls are recorded as moderate because they mitigate risk most of the time but there is room for improvement. The impact is assessed to be low due to the small number of additional lights found.		
Actions taken to resolve the issue		Completion date	Remedial action status
QLDC has instructed McKay Electrical to carry out a field inventory as per their contract, which will capture these discrepancies		30 November 2022	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
QLDC has instructed McKay Electrical to carry out a field inventory as per their contract which will capture these discrepancies		30 November 2022	

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 DUMML 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.

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 DUMML 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 contains a complete audit trail of all additions and changes to the database information.

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 two geographical strata, as follows: <ol style="list-style-type: none"> 1. Frankton 2. Queenstown
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	126 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 126 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	94.5	Wattage from survey is higher than the database wattage by 5.5%
R _L	90.0	With a 95% level of confidence, it can be concluded that the error could be between -10% and- 0.2%
R _H	99.8	

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.

The conclusion from Scenario B is that the variability of the sample results across the strata means that the true wattage (installed in the field) could be between -10% and 0.2% lower than the wattage recorded in the DUML database. Non-compliance is recorded because the potential error is greater than 5.0%.

In absolute terms the installed capacity is estimated to be 2 kW lower than the database indicates.

There is a 95% level of confidence that the installed capacity is 4 kW lower than the database.

In absolute terms, total annual consumption is estimated to be 9,900 kWh lower than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 18,000 kWh to 4,000 kWh p.a. lower than the database indicates.

Scenario	Description
A - Good accuracy, good precision	<p>This scenario applies if:</p> <ul style="list-style-type: none"> (a) R_H is less than 1.05; and (b) R_L is greater than 0.95 <p>The conclusion from this scenario is that:</p> <ul style="list-style-type: none"> (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	<p>This scenario applies if:</p> <ul style="list-style-type: none"> (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. <p>There is evidence to support this finding. In statistical terms, the inaccuracy is statistically significant at the 95% level</p>
C - Poor precision	<p>This scenario applies if:</p> <ul style="list-style-type: none"> (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 <p>The conclusion from this scenario is that the best available estimate is not precise enough to conclude that the database is accurate within +/- 5 %</p>

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.

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

The last audit recommended that the LED light details in RAMM should record sufficient details to enable the confirmation that the correct wattage is being applied. Additional details have now been added to RAMM for some LED lights in the 'LED description' field, however this is still a work in progress.

I repeat the recommendation from the last audit:

Description	Recommendation	Audited party comment	Remedial action
Database Accuracy	Continue to work with QLDC and McKay Electrical to provide LED light details.	QLDC have required McKay Electrical to carry out a field inventory as part of their contract and to supply LED technical light data to be populated in their DB	Identified

ICP Accuracy

As discussed in **sections 2.1** and **3.2**, 30 items of load were recorded against two ICPs, one in the NZTA Central Otago Aurora database and the other in this database. This has been corrected as of 30/11/21 but revisions have not been carried out to the duplicated submission for the available 14 month revision period resulting in an estimated over submission of 20,120 kWh.

Further investigation identified a further 31 lamps that were incorrectly recorded against ICP 0000027638CECB5 (NSP FKN0331) and should have been recorded against ICP 0000486695CE506 (NSP CML0331). These have been removed and added to the correct ICP in November 2021. This is also discussed in the NZTA Otago Aurora DUMML audit report. These ICPs are in different balancing areas so this will impact submission accuracy. No revisions been carried out to correct the volumes incorrectly submitted against ICP 0000027638CECB5 for the available 14 month revision period resulting in an estimated 17,103 kWh of submission against the incorrect ICP and therefore the balancing area.

Address accuracy

There were no issues found with location information.

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 a "light date added" and a "lamp date changed", the monthly report is provided with changes made through the month.

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

McKay Electrical is the contractor for QLDC, Pocket RAMM is used in the field to issue work and record changes in the field into RAMM 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: 21-Jan-21 To: 30-Nov-21	The database is not confirmed as accurate with a 95% level of confidence with a potential under submission of approximately be 9,900 kWh per annum. Revisions not carried out for duplicated lights resulting in an estimated over submission of 23,121 kWh over the available 14 month revision period. Revisions not carried out to correct the volumes for the available 14 month revision period resulting in approximately 17,103 kWh of submission against the incorrect balancing area. LED lights recorded with insufficient descriptions to confirm lamp wattage. Potential impact: Medium Actual impact: Medium Audit history: Once 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
QLDC have instructed McKay Electrical to populate LED data into the DB		30 November 2022	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
QLDC have instructed McKay Electrical to populate LED data into the DB		31 March 2022	

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. Wattages are derived from a database extract Trustpower receives monthly.

I recalculated the submissions for November 2021 using the data logger and the database information. I confirmed that it was calculated accurately based on the database and data logger information.

An issue was raised in the last audit report that identified approximately 30 lamps recorded in the NZTA database against ICP 0000027638CECB5, that were also recorded against ICP0000486695CE506. This was investigated by QLDC, and these have been removed from the database in November 2021. No revisions of the duplicated lights have been made resulting in an estimated over submission for the last 14 months (the available revision period) of 23,120 kWh.

Further investigation identified a further 31 lamps that were incorrectly recorded against ICP 0000027638CECB5 (NSP FKN0331) and should have been recorded against ICP 0000486695CE506 (NSP CML0331). These have been removed and added to the correct ICP in November 2021. This is also discussed in the NZTA Otago Aurora DUML audit report. These ICPs are in different balancing areas so this will impact submission accuracy. No revisions been carried out to correct the volumes incorrectly submitted against ICP 0000027638CECB5 for the available 14 month revision period resulting in an estimated 20,405.56 kWh of submission against the incorrect ICP and therefore the balancing area.

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 under submission of 9,900 kWh per annum. This is detailed in **section 3.1**.

The monthly report is provided with changes made through the month. The database contains a “light date added” and a “lamp date changed”.

Audit outcome

Non-compliant

Non-compliance	Description		
<p>Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c)</p> <p>From: 21-Jan-21 To: 30-Nov-21</p>	<p>Revisions not carried out for duplicated lights resulting in an estimated over submission of 23,121 kWh over the available 14 month revision period.</p> <p>Revisions not carried out to correct the volumes for the available 14 month revision period resulting in approximately 17,103 kWh of submission against the incorrect balancing area.</p> <p>The database is not confirmed as accurate with a 95% level of confidence with a potential under submission of approximately be 9,900 kWh per annum.</p> <p>Potential impact: Medium Actual impact: Medium Audit history: Once Controls: Moderate Breach risk rating: 4</p>		
Audit risk rating	Rationale for audit risk rating		
<p>Medium</p>	<p>The controls are rated as moderate as processes to manage change capture most changes.</p> <p>The impact is assessed to be medium due to the impact on submission.</p>		
Actions taken to resolve the issue		Completion date	Remedial action status
<p>Trustpower is endeavouring to establish an accurate lamp count and as adjustments are made these are included in any revisions that are submitted. Unfortunately, due to the nature of this DUML and the parties involved, this process often takes longer than the Revision timeframe. Trustpower will continue to work with the parties to improve the accuracy of the DUML database and will submit the most accurate information we have available for all revisions.</p>		<p>30 November 2022</p>	<p>Investigating</p>
Preventative actions taken to ensure no further issues will occur		Completion date	
<p>Investigating</p>		<p>30 November 2022</p>	

CONCLUSION

The database is remotely hosted by thinkproject New Zealand Limited. The RAMM database is managed by QLDC. QLDC provide a monthly report to Trustpower of this database. Trustpower reconciles the DUML load using the STL profile. Wattages are derived from a RAMM database extract. On and off times are derived from a data logger.

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.

An issue was raised in the last audit report that identified approximately 30 lamps recorded in the NZTA database against ICP 0000027638CECB5, that were also recorded against ICP0000486695CE506. This was investigated by QLDC, and these have been removed from the database in November 2021. No revisions of the duplicated lights have been made resulting in an estimated over submission for the available 14 month revision period of 23,120 kWh.

Further investigation identified a further 31 lamps that were incorrectly recorded against ICP 0000027638CECB5 (NSP FKN0331) and should have been recorded against ICP 0000486695CE506 (NSP CML0331). These have been removed and added to the correct ICP in November 2021. This is also discussed in the NZTA Otago Aurora DUML audit report. These ICPs are in different balancing areas so this will impact submission accuracy. No revisions been carried out to correct the volumes incorrectly submitted against ICP 0000027638CECB5 for the available 14 month revision period resulting in an estimated 17,103 kWh of submission against the ICP and therefore the incorrect balancing area.

The field audit was undertaken of a statistical sample of 126 items of load was undertaken on the 28th and 29th January 2022. This found that the database is not within the allowable +/-5% accuracy threshold and over submission is likely to be occurring as a result:

- in absolute terms the installed capacity is estimated to be 2 kW lower than the database indicates,
- there is a 95% level of confidence that the installed capacity is 4 kW lower than the database,
- in absolute terms, total annual consumption is estimated to be 9,900 kWh lower than the DUML database indicates, and
- there is a 95% level of confidence that the annual consumption is between 18,000 kWh to 4,000 kWh p.a. lower than the database indicates.

The audit found four non-compliances and makes one recommendation. The future risk rating of 14 indicates that the next audit be completed in 12 months. I have considered this in conjunction with Trustpower's responses and recommend that the next audit be in 12 months.

Participant response

Trustpower has reviewed this report and their comments are contained within the report.