ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

For

NZTA CENTRAL OTAGO AURORA DATABASE AND TRUSTPOWER

NZBN: 9429038917912

Prepared by: Rebecca Elliot

Date audit commenced: 22 November 2021

Date audit report completed: 17 February 2022

Audit report due date: 22 February 2022

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EXECUTIVE SUMMARY

This audit of the **NZTA Central Otago (NZTA) Aurora network** 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 managed by Aurora and the data is held in their GIS system. Delta is the field contractor for Central Otago NZTA outside of the QLDC area, on the Aurora Network. Delta advises the Council of any changes as a result of field work. This was previously provided to Aurora by way of a monthly file on the first working day of the month and updated in GIS. This arrangement is no longer in place and ceased on 1 July 2021; there is currently no mechanism for updating the Aurora data base.

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 from Aurora.

The field audit was undertaken of a statistical sample of 157 items of load in Central Otago on the 28th 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:

- there is a 95% level of confidence that the installed capacity is between 5 kW lower to 2 kW higher than the database,
- in absolute terms, total annual consumption is estimated to be 1,800 kWh lower than the DUML database indicates, and
- there is a 95% level of confidence that the annual consumption is between -22,300 kWh p.a. lower to 8,000 kWh p.a. higher than the database indicates.

The last audit identified approximately 30 lamps recorded in two databases. The QLDC RAMM database had 30 lamps associated with ICP 0000027638CECB5, the lamps were also recorded in the NZTA Aurora database. These lamps have been removed from the QLDC RAMM database and are no longer associated with ICP 0000027638CECB5. I have identified 10 NZTA lights that are not captured in the Aurora database, and the list of lights has been provided to Aurora.

QLDC identified a further 30 lights that were incorrectly being reconciled to ICP 0000027638CECB5 (NSP FKN0331). These have been added to ICP 0000486695CE506 (NSP CML0331). 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 0000486695CE506 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 audit found four non-compliances and makes two recommendations. The future risk rating of 27 indicates that the next audit be completed within three months. I have considered this in conjunction with Trustpower's comments and to allow sufficient time for the discussions to take place to explore if the additional lights are to be added to the QLDC database, I recommend that the next audit be in nine 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	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. In absolute terms, total annual consumption is estimated to be 1,800 kWh lower than the DUML database indicates, as recorded in section 3.1. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.	None	Medium	8	Investigating
All load recorded in database	2.5	11(2A) of Schedule 15.3	Four additional items of load were found in the field.	Weak	Low	3	Investigating
Database accuracy	3.1	15.2 and 15.37B(b)	The database is inaccurate. In absolute terms, total annual consumption is estimated to be to be 1,800 kWh lower than the DUML database indicates. 44 items of load with incomplete lamp descriptions. LED lights recorded with insufficient descriptions to confirm lamp wattage. 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. Load changes no longer maintained in the Aurora GIS database.	None	Medium	8	Investigating

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Volume information accuracy	3.2	15.2 and 15.37B(c)	The database is inaccurate. In absolute terms, total annual consumption is estimated to be to be 1,800 kWh lower than the DUML database indicates. 44 items of load with incomplete lamp descriptions. LED lights recorded with insufficient descriptions to confirm lamp wattage. Load changes no longer maintained in the Aurora GIS database.	None	Medium	8	Investigating
Future Risk Rating						27	

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 CODC to provide LED light details.
		Update the database for 10 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

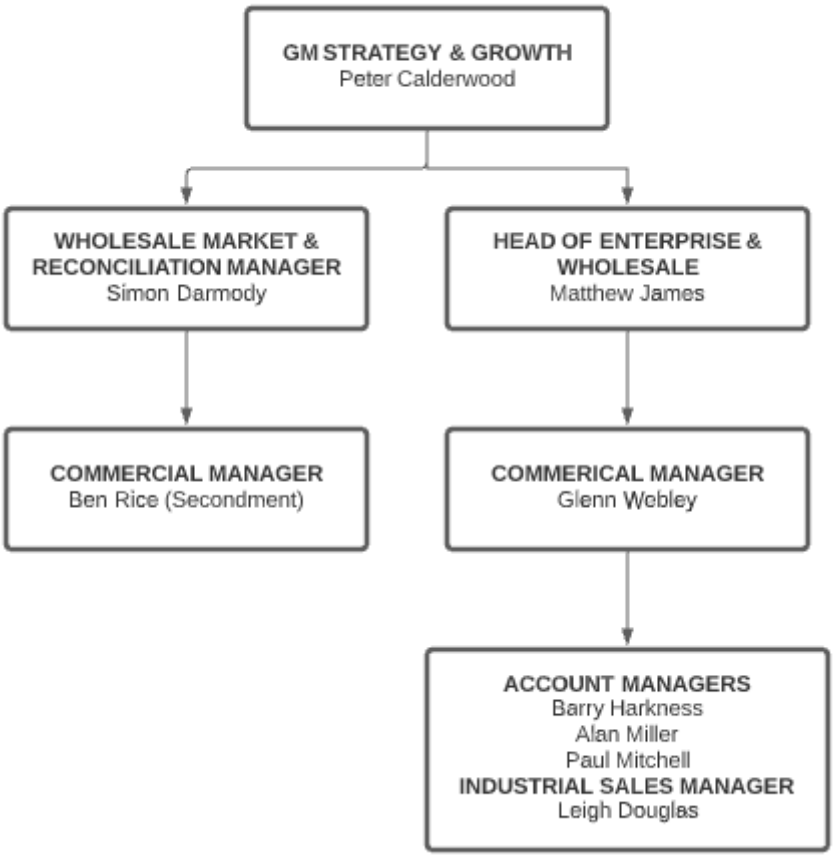
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

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
Tammy Dovey	Asset Information Analyst	Aurora Energy
Simeon Dwyer	Network Billing Analyst	Aurora Energy

1.4. Hardware and Software

The GIS database used for the management of DUML is managed by Aurora.

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)
0000486694CE943	Central Otago State Highways CYD0331	CYD0331	STL	226	35,028
0000486695CE506	Central Otago State Highways CML0331	CML0331	STL	98	16,155
TOTAL				324	51,183

1.7. Authorisation Received

All information was provided directly by Trustpower and Aurora.

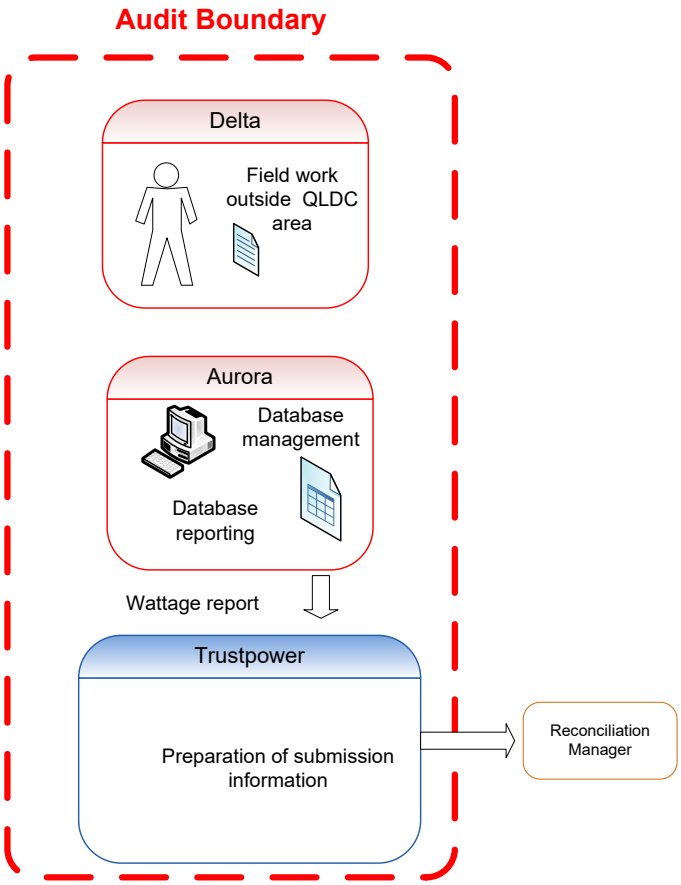
1.8. Scope of Audit

This audit of the **NZTA Central Otago (NZTA) Aurora network** 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 managed by Aurora and the data is held in their GIS system. Delta is the field contractor for Central Otago NZTA outside of the QLDC area, on the Aurora Network. Delta advises the Council of any changes as a result of field work. This was previously provided to Aurora by way of a monthly file on the first working day of the month and updated in GIS. This arrangement is no longer in place and ceased on 1 July 2021; there is currently no mechanism for updating the Aurora data base.

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



The audit was carried out on 28th January 2022. The field audit was undertaken of 157 lights using the statistical sampling methodology.

1.9. Summary of previous audit

The previous audit was completed in March 2021 by Rebecca Elliot of Veritek Limited. Three non-compliances were identified, and no recommendations were made. The statuses of the non-compliances and recommendations are described below.

Subject	Section	Clause	Non-compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	The database extract contained ten more lights than the monthly wattage report being supplied to Trustpower. This will be resulting in an estimated under submission of 3,286 kWh per annum.	Cleared
			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
			Five lamps with no gear wattage recorded resulting in an estimated minor under submission of 769 kWh per annum.	Cleared
			In absolute terms, total annual consumption is estimated to be 3,100 kWh higher than the DUML database indicates, as recorded in section 3.1.	Still existing
			The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.	Still existing
All load recorded in database	2.5	11(2A) of Schedule 15.3	Seven additional items of load were found in the field.	Still existing
Database accuracy	3.1	15.2 and 15.37B(b)	The database is inaccurate. In absolute terms, total annual consumption is estimated to be 3,100 kWh higher than the DUML database indicates.	Still existing
			36 items of load with incomplete lamp descriptions.	Still existing
			Five lamps with no gear wattage recorded resulting in an estimated minor under submission of 769 kWh per annum.	Cleared
			LED lights recorded with insufficient descriptions to confirm lamp wattage.	Still existing
			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

Subject	Section	Clause	Non-compliance	Status
Volume information accuracy	3.2	15.2 and 15.37B(c)	The database extract contained ten more lights than the monthly wattage report being supplied to Trustpower. This will be resulting in an estimated under submission of 3,286 kWh per annum.	Cleared
			Approximately 30 lamps in Wanaka submitted against the incorrect ICP.	Cleared
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			Five lamps with no gear wattage recorded resulting in an estimated minor under submission of 769 kWh per annum.	Cleared
			In absolute terms, total annual consumption is estimated to be 3,100 kWh higher than the DUML database indicates, as recorded in section 3.1.	Still existing
			The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.	Still existing

Subject	Section	Recommendation	Status
Database accuracy	3.1	Work with CODC to provide LED light details to Aurora.	Still existing
		Determine the correct database and ICP for the NZTA lights in Wanaka and surrounds.	Still exiting for 10 lights
		Review database updating process with the parties concerned to ensure that the database is updated in a timely manner.	Still existing – now no updates

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 November 2021 using the data logger and the database information. I confirmed the calculation was correct.

The 10 additional lamps identified in the last audit that were not included in the submission were investigated by Trustpower and this has now been resolved.

The last audit identified approximately 30 lamps recorded in two databases. The QLDC RAMM database had 30 lamps associated with ICP 0000027638CECB5, the lamps were also recorded in the NZTA Aurora database. These lamps have been removed from the QLDC RAMM database and are no longer associated with ICP 0000027638CECB5.

QLDC identified a further 30 lights that were incorrectly being reconciled to ICP 0000027638CECB5 (NSP FKN0331). 20 of these have been added to ICP 0000486695CE506 (NSP CML0331). There are a further ten lights that are still to be added to the Aurora database. 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 0000486695CE506 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 (this includes the ten missing lights) .

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 1,800 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 current monthly report is provided as a snapshot and this practice is non-compliant. The database contains an “install date”. 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.

There is currently no mechanism for updating the Aurora database. A file was previously provided to Aurora by way of a monthly file on the first working day of the month and updated any field changes in GIS. This arrangement is no longer in place and ceased on 1 July 2021.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3	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. In absolute terms, total annual consumption is estimated to be 1,800 kWh lower than the DUML database indicates, as recorded in section 3.1. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.
From: 15-Sep-20 To: 15-Jan-21	Potential impact: Medium Actual impact: Medium Audit history: Multiple times Controls: None Breach risk rating: 8
Audit risk rating	**Rationale for audit risk rating**
Medium	Controls are rated as none as this database is no longer being maintained. The impact is assessed to be medium, based on the potential kWh variances detailed above but this will increase until a solution is identified to maintain and update the database.

Actions taken to resolve the issue	Completion date	Remedial action status
In discussions with QLDC to take over all NZTA lights in the CODC area and add them to their existing DB. Initial feedback from QLDC has been positive, but the change will need to be approved by all parties (QLDC, Delta, NZTA) This will mean all NZTA lights in the Central Otago are covered in one DB. QLDC have proven competent at managing STL data, including the QLDC ICP that was separated from this DUML and assigned to them as an outcome of last years' audit. Meeting between these parties is being arranged with urgency	31 March 2020	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Our best opportunity to achieve accurate submission data going forward is to work with Delta and QLDC – who have processes and a database that will allow us to meet the level of accuracy required for this DUML. Outcomes of the meetings with these parties will determine if that is going to be possible.	30 June 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

An ICP number is recorded for each item of load.

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

GPS coordinates and street addresses are recorded for each item of load.

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.

Audit commentary

A light type description the light wattage and the ballast is recorded in the database for all items of load.

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 157 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
STATE HIGHWAY 84 Wanaka – Luggate Riverbank Rd intersection			+1	5	1 x 250 HPS recorded in database but 153W LED located in the field. 3 x 250W HPS recorded in database but 3 x 102W LED located in field. 1 x 150W HPS recorded in database but 1 x 102W LED located in field. 1 additional 103W LED located in the field.
Luggate Cromwell Rd/Gilmore Rd				1	1 x 110W HPS recorded in the database but 1 x 250W HPS found in the field
Cnr Highway 8B and Sargood Rd			-1		1 x 150W HPS recorded in the database but no light on pole in the field
Pinot Gris Place				1	1 x 17W LED recorded in the database but 103W LED located in the field

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
Lauder Omakau Rd			+2		2 additional 125W MV not recorded in the database, located in the field
Corner Ngapara St and Manuherikia Rd			+1		1 additional x 70W HPS located in the field
Cnr Scotland St and Abbotsford St			-1		1 x 101 W LED recorded in the database, but lamp not located in the field
Scotland St				4	1 x 23W LED recorded in the database but 149W LED located in the field. 1 x 250W MV recorded in the database but 149W LED located in the field 2 x 70W LED recorded in the database but 2 x 75W LED found in the field (Ped crossing)
Grand Sample Total			**6 (+4-2)**	**11**	

The field audit found four additional items of load. The overall database accuracy is detailed in **section 3.1**.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.5 With: Clause 11(2A) and (d) of Schedule 15.3 From: 15-Sep-20 To: 15-Jan-21	Four additional items of load were found in the field. Potential impact: Low Actual impact: Low Audit history: Once Controls: Weak Breach risk rating: 3		
Audit risk rating	**Rationale for audit risk rating**		
Low	The controls are recorded as weak as Aurora are not the field contractor and changes are no longer being maintained in the GIS database. The impact is assessed to be low. The overall database accuracy is detailed in **section 3.**1.		
Actions taken to resolve the issue		**Completion date**	**Remedial action status**
All discrepancies found in the field audit have been corrected in the database. As per the comment above – we are in discussions to attempt to change the management of data from field contractor (Delta) through to QLDC and through to us as Retailer, removing Aurora from the process. Controls have been rated as weak because Aurora are not receiving updates. However, Aurora, as the network operator – do require and receive updates from the field contractor Delta so that they can maintain their network charging data. While the information provided from Delta to Aurora is not "DUML Submission quality" in terms of precision around install dates, and wattages etc, it does provide a level of control to ensure our submission data is reflecting field data.		31 March 2022	Investigating
Preventative actions taken to ensure no further issues will occur		**Completion date**	
Our best opportunity to achieve accurate submission data going forward is to work with Delta and QLDC – who have processes and a database that will allow us to meet the level of accuracy required for this DUML. Outcomes of the meetings with these parties will determine if that is going to be possible.		30 June 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 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 database tracks additions and removals as required by this clause.

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 database has a complete and compliant audit trail.

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 Central Otago lights on the Aurora network
Strata	The database contains items of load Central Otago Aurora network area. The area has two distinct sub-groups of urban and rural. The processes for the management of NZTA Aurora Central Otago items of load are the same, but I decided to place the items of load into two geographical strata, as follows: 1. Alexandra 2. 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 50 sub-units.
Total items of load	157 items of load were checked.

Wattages were checked for alignment with the published standardised wattage table produced by the Electricity Authority.

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

Audit commentary

Field audit findings

A field audit was conducted of a statistical sample of 157 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	99.2	Wattage from survey is higher than the database wattage by 0.8%
R_L	89.8	With a 95% level of confidence, it can be concluded that the error could be between -10.2% and 3.7%
R_H	103.7	

These results were categorised in accordance with the "Distributed Unmetered Load Statistical Sampling Audit Guideline", effective from 1 February 2019 and the table below shows that Scenario C (detailed below) applies.

The conclusion from Scenario C is that the variability of the sample results across the strata means that the true wattage (installed in the field) could be between10.2% lower and 3.7% higher than the wattage recorded in the DUML database. Non-compliance is recorded because the potential error is greater than 5.0%.

There is a 95% level of confidence that the installed capacity is between 5 kW lower to 2 kW higher than the database.

In absolute terms, total annual consumption is estimated to be 1,800 kWh lower than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between -22,300 kWh p.a. lower to 8,000 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 a small number of errors. 44 items of load had an incomplete lamp description as detailed in the table below:

Lamp descriptions	Lamp Quantity
LED	38
Monument light, or ped cross, no beacons	2
Pedestrian crossing beacon with floodlights	4

These were also noted in the last audit.

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.

I repeat the recommendation from the last audit, to add additional information to the Description field. 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

Aurora is not the contractor for streetlights, and they do not have any further information provided to them. I repeat the recommendation that Trustpower approach CODC to get this information.

Description	Recommendation	Audited party comment	Remedial action
Database Accuracy	Work with CODC to provide LED light details.	NZTA have indicated they are prepared to carry out a field inventory as CODC don't include NZTA lights in their DB	Investigating

This is recorded as non-compliance below.

Address accuracy

There were no issues found with location information.

ICP number and owner accuracy

The last audit identified approximately 30 lamps recorded in two databases. The QLDC RAMM database had 30 lamps associated with ICP 0000027638CECB5, the lamps were also recorded in the NZTA Aurora database. These lamps have been removed from the QLDC RAMM database and are no longer associated with ICP 0000027638CECB5.

Description	Recommendation	Audited party comment	Remedial action
Database accuracy	Update the database for 10 NZTA lights in Wanaka and surrounds.	NZTA have indicated they are prepared to carry out a field inventory as CODC don't include NZTA lights in their DB	Investigating

QLDC identified a further 30 lights that were incorrectly being reconciled to ICP 0000027638CECB5 (NSP FKN0331). 20 of these have been added to ICP 0000486695CE506 (NSP CML0331). There are a further ten lights that are still to be added to the Aurora database. 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 0000486695CE506 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 (this includes the ten missing lights).

Change management process findings

The database is managed by Aurora and the data is held in their GIS system. Delta is the field contractor for Central Otago NZTA outside of the QLDC area, on the Aurora Network. Delta advises the Council of any changes as a result of field work. This was previously provided to Aurora by way of a monthly file on the first working day of the month and updated in GIS. This arrangement is no longer in place and ceased on 1 July 2021; there is currently no mechanism for updating the Aurora data base. This is recorded as non-compliance.

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

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 15- Sept-20 To: 15-Jan-21	The database is inaccurate. In absolute terms, total annual consumption is estimated to be to be 1,800 kWh lower than the DUML database indicates. 44 items of load with incomplete lamp descriptions. LED lights recorded with insufficient descriptions to confirm lamp wattage. 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. Load changes no longer maintained in the Aurora GIS database. Potential impact: Medium Actual impact: Medium Audit history: Multiple times Controls: None Breach risk rating: 8
Audit risk rating	**Rationale for audit risk rating**
Medium	Controls are rated as none as this database is no longer being maintained. The impact is assessed to be medium, based on the potential kWh variances detailed above but this will increase until a solution is identified to maintain and update the database.

Actions taken to resolve the issue	Completion date	Remedial action status
As per the comment above – we are in discussions to attempt to change the management of data from field contractor (Delta) through to QLDC and through to us as Retailer, removing Aurora from the process. Controls have been rated as weak because Aurora are not receiving updates. However, Aurora, as the network operator – do require and receive updates from the field contractor Delta so that they can maintain their network charging data. While the information provided from Delta to Aurora is not "DUML Submission quality" in terms of precision around install dates, and wattages etc, it does provide a level of control to ensure our submission data is reflecting field data.	31 March 2022	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Our best opportunity to achieve accurate submission data going forward is to work with Delta and QLDC – who have processes and a database that will allow us to meet the level of accuracy required for this DUML. Outcomes of the meetings with these parties will determine if that is going to be possible.	30 June 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. Trustpower receives a monthly wattage report.

I recalculated the submissions for November 2021 using the data logger and the database information.

The 10 additional lamps identified in the last audit that were not included in the submission were investigated by Trustpower and this has now been resolved.

The last audit identified approximately 30 lamps recorded in two databases. The QLDC RAMM database had 30 lamps associated with ICP 0000027638CECB5, the lamps were also recorded in the NZTA Aurora database. These lamps have been removed from the QLDC RAMM database and are no longer associated with ICP 0000027638CECB5. I have identified 10 NZTA lights that are not captured in the Aurora database, and the list of lights has been provided to Aurora.

QLDC identified a further 30 lights that were incorrectly being reconciled to ICP 0000027638CECB5 (NSP FKN0331). 20 of these have been added to ICP 0000486695CE506 (NSP CML0331). There are a further ten lights that are still to be added to the Aurora database. 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 0000486695CE506 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 (this includes the ten missing lights).

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 1,800 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 current monthly report is provided as a snapshot and this practice is non-compliant. The database contains an "install date". 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.

There is currently no mechanism for updating the Aurora database. A file was previously provided to Aurora by way of a monthly file on the first working day of the month and updated any field changes in GIS. This arrangement is no longer in place and ceased on 1 July 2021.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: 15-Sep-20 To: 15-Jan-21	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. In absolute terms, total annual consumption is estimated to be 1,800 kWh lower than the DUML database indicates, as recorded in section 3.1. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. Potential impact: Medium Actual impact: Medium Audit history: Multiple times Controls: None Breach risk rating: 8
Audit risk rating	**Rationale for audit risk rating**
Medium	Controls are rated as none as this database is no longer being maintained. The impact is assessed to be medium, based on the potential kWh variances detailed above but this will increase until a solution is identified to maintain and update the database.

Actions taken to resolve the issue	Completion date	Remedial action status
Controls have been rated as "none" because Aurora are not receiving updates. However, Aurora, as the network operator – do require and receive updates from the field contractor Delta so that they can maintain their network charging data. While the information provided from Delta to Aurora is not "DUML Submission quality" in terms of precision around install dates, and wattages etc, it does provide a level of control to ensure our submission data is reflecting field data. All discrepancies found in the field audit have now been corrected.	31 March 2022	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Our best opportunity to achieve accurate submission data going forward is to work with Delta and QLDC – who have processes and a database that will allow us to meet the level of accuracy required for this DUML. Outcomes of the meetings with these parties will determine if that is going to be possible.	30 June 2022	

CONCLUSION

The database is managed by Aurora and the data is held in their GIS system. Delta is the field contractor for Central Otago NZTA outside of the QLDC area, on the Aurora Network. Delta advises the Council of any changes as a result of field work. This was previously provided to Aurora by way of a monthly file on the first working day of the month and updated in GIS. This arrangement is no longer in place and ceased on 1 July 2021; there is currently no mechanism for updating the Aurora data base.

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 from Aurora.

The field audit was undertaken of a statistical sample of 157 items of load in Central Otago on the 28th 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:

- there is a 95% level of confidence that the installed capacity is between 5 kW lower to 2 kW higher than the database,
- in absolute terms, total annual consumption is estimated to be 1,800 kWh lower than the DUML database indicates, and
- there is a 95% level of confidence that the annual consumption is between -22,300 kWh p.a. lower to 8,000 kWh p.a. higher than the database indicates.

The last audit identified approximately 30 lamps recorded in two databases. The QLDC RAMM database had 30 lamps associated with ICP 0000027638CECB5, the lamps were also recorded in the NZTA Aurora database. These lamps have been removed from the QLDC RAMM database and are no longer associated with ICP 0000027638CECB5. I have identified 10 NZTA lights that are not captured in the Aurora database, and the list of lights has been provided to Aurora.

QLDC identified a further 30 lights that were incorrectly being reconciled to ICP 0000027638CECB5 (NSP FKN0331). These have been added to ICP 0000486695CE506 (NSP CML0331). 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 0000486695CE506 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 audit found four non-compliances and makes two recommendations. The future risk rating of 27 indicates that the next audit be completed within three months. I have considered this in conjunction with Trustpower's comments and to allow sufficient time for the discussions to take place to explore if the additional lights are to be added to the QLDC database, I recommend that the next audit be in nine months.

Participant response

My initial meeting with QLDC about them taking over the NZTA lights in the CODC was well received and they have now indicated that they want to have a meeting with all parties to ascertain what and how this can work going forward. There needs to be a reporting system put in place that can capture any changes or additions made by Delta who are the contactors for NZTA in the CODC area.

NZTA have indicated that they are prepared to pay to have a field inventory carried out in the CODC area and QLDC have planned the same for their complete area.

By getting all the NZTA lights in the Central Otago area visited and recorded against the correct ICP, off the appropriate GXP, then this will sort out all the above problem that have been identified in this audit including the reconciliation of the energy between the GXP's and ICP's. This can't be done until we sort the correct load for each ICP.