

ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT



For

CENTRAL OTAGO DISTRICT COUNCIL
RAMM DATABASE
AND CONTACT ENERGY
NZBN: 9429038549977

Prepared by: Steve Woods

Date audit commenced: 5 January 2024

Date audit report completed: 18 January 2024

Audit report due date: 01-Feb-24

TABLE OF CONTENTS

Executive summary	3
Audit summary	4
Non-compliances	4
Recommendations	5
Issues 5	
1. Administrative	6
1.1. Exemptions from Obligations to Comply with Code	6
1.2. Structure of Organisation	6
1.3. Persons involved in this audit.....	7
1.4. Hardware and Software	7
1.5. Breaches or Breach Allegations.....	7
1.6. ICP Data	7
1.7. Authorisation Received	8
1.8. Scope of Audit	8
1.9. Summary of previous audit	9
Table of Non-Compliance.....	9
Recommendations	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)	14
2.6. Tracking of load changes (Clause 11(3) of Schedule 15.3)	15
2.7. Audit trail (Clause 11(4) of Schedule 15.3).....	16
3. Accuracy of DUML database	17
3.1. Database accuracy (Clause 15.2 and 15.37B(b))	17
3.2. Volume information accuracy (Clause 15.2 and 15.37B(c))	21
Conclusion	24
Participant response	25

EXECUTIVE SUMMARY

This audit of the **Central Otago District Council (CODC)** Unmetered Streetlights DUML RAMM database and processes was conducted at the request of **Contact Energy Limited (Contact)**, 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.

This audit includes all streetlights for CODC load as recorded in RAMM.

The RAMM database is managed by CODC and is remotely hosted by thinkproject New Zealand Limited. The field work is carried out mostly by Delta, but also by Powernet and McKay Electrical. The asset data capture and database population are conducted by BECA for new connections and CODC for maintenance.

The field audit was undertaken of a statistical sample of 234 items of load in CODC area on 3rd and 4th January 2024.

The field audit indicated that the database was not within the allowable +/-5% variance threshold and is therefore deemed to be inaccurate. This is discussed in **section 3.1**. The error is 20.9% resulting in under submission of 53,500 kWh per annum. Nine incorrect wattages from the last audit were not corrected.

The total volume submitted to the Reconciliation Manager is based on a monthly database report derived from RAMM, and the “burn time” which is sourced from data loggers. The methodology is compliant.

I checked the submission calculation provided by Contact for November 2023 and it matches the database.

As noted in the previous audit report, CODC have no central management system in place and no plans to install one, but the fittings have fixed dimming for all Betacom lights (1,750 items of load or 80% of all lights) installed on their network. This was part of the night sky initiative in the area. The lights reduce their power consumption to 60% between the hours of midnight to 5am year-round. Currently this is not reflected in the submission volumes. This will be resulting in an estimated annual over submission of 25,000 kWh. New ICPs have been created and it is intended that submission will occur against the new ICPs, using the dimming profile that was approved by the Authority and noted in the previous audit. These will be applied once golden meters can be installed, then the volumes will reflect the dimming. This project has not progressed since the previous audit. The next steps for this project are as follows:

- select a suitable MEP to install the check meter,
- arrange for the meter to be installed on a load of at least 100 watts,
- set up a new ICP for the check meter with a status of “inactive - reconciled elsewhere”, and
- develop a process to obtain and use the check meter data output to confirm the on/off times, the start and end of dimming times and the level of dimming.

The audit found four non-compliances and makes two recommendations. The future risk rating of 25 indicates that the next audit be completed in three months. I have considered this in conjunction with Contact’s comments and recommend that the next audit be completed in Six months. This should allow sufficient time to develop processes to account for dimming and to improve the new connections process.

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>Over submission of an estimated 25,000 kWh per annum due to the hard-wired dimming LED lamps for 80% of the total lamps installed.</p> <p>The data used for submission does not track changes at a daily basis and is provided as a snapshot.</p> <p>One lamp with incorrect ballast applied resulting in very minor over submission of 542 kWh per annum.</p> <p>In absolute terms, total annual consumption is estimated to be 53,500 kWh higher than the DUML database indicates.</p>	Weak	High	9	Identified
All load recorded in database	2.5	11(2A) of Schedule 15.3	15 additional lights were found in the field.	Moderate	Low	2	Identified
Database accuracy	3.1	15.2 and 15.37B(b)	<p>In absolute terms, total annual consumption is estimated to be 53,500 kWh higher than the DUML database indicates.</p> <p>Nine incorrect wattages from the last audit not corrected.</p> <p>One lamp with incorrect ballast applied resulting in very minor over submission of 542 kWh per annum.</p> <p>Two incorrect light model descriptions.</p> <p>New lights are not added to RAMM at the date of electrical connection.</p>	Moderate	High	6	Identified
Volume information accuracy	3.2	15.2 and 15.37B(c)	Over submission of an estimated 25,000 kWh per annum due to the hard-wired dimming LED lamps	Weak	High	9	Identified

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
			<p>for 80% of the total lamps installed.</p> <p>The data used for submission does not track changes at a daily basis and is provided as a snapshot.</p> <p>One lamp with incorrect ballast applied resulting in very minor over submission of 542 kWh per annum.</p> <p>In absolute terms, total annual consumption is estimated to be 53,500 kWh higher than the DUML database indicates.</p>				
Future Risk Rating						25	

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
Location of each item of load	2.3	Liaise with CODC to obtain better address information to ensure the lights are locatable where GPS co-ordinates are not recorded.
Light make and model	2.4	Populate the light make and model field for 51 items of load.

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

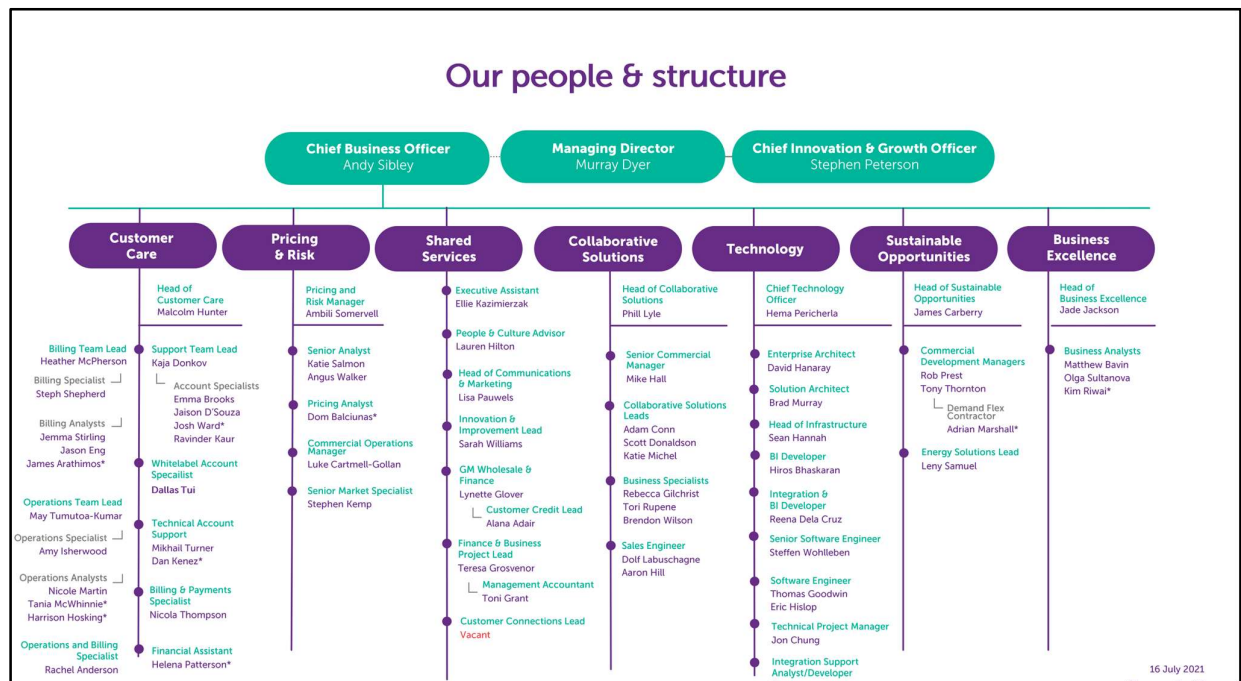
The Electricity Authority’s website was reviewed to identify any exemptions relevant to the scope of this audit.

Audit commentary

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

1.2. Structure of Organisation

Contact provided a copy of their organisational structure.



1.3. Persons involved in this audit

Name	Company	Role
Steve Woods	Veritek Limited	Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Luke Cartmell-Gollan	Commercial Operations Manager	Simply Energy
Dallas Tui	Whitelabel Account Specialist	Simply Energy
Mark Hardman	Roading Asset Engineer	Central Otago DC

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.

Access to the database is secure by way of password protection.

Systems used by the trader and their agent 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	Description	Profile	Number of items of load	Database wattage (watts)
0000481144CEF63	CROMWELL GXP	DST	291	17,895
0000002553CE07F	CLYDE GXP	DST	98	4,846
0001982630TG886	NASEBY GXP	DST	42	3,405
0000510662CEE3*	CLYDE GXP	RPS	818	14,932
0001982631TG4C3	NASEBY GXP	RPS	187	3,413
0000510663CE2F6*	CROMWELL GXP	RPS	714	15,037
Blank ICP			2	34
TOTAL			2,166	59,876

As recorded in the last audit, two ICPs are recorded in the database but are not being used for submission, they are identified as ‘reconciled elsewhere’. ICP 0001982631TG4C3 is recorded as “active”, however all volumes are reported against ICP 0000481144CEF63.

All three ICPs with the “RPS” profile are expected to be used once the new approved streetlight profile can be used. This is discussed further in **section 2.1**.

1.7. Authorisation Received

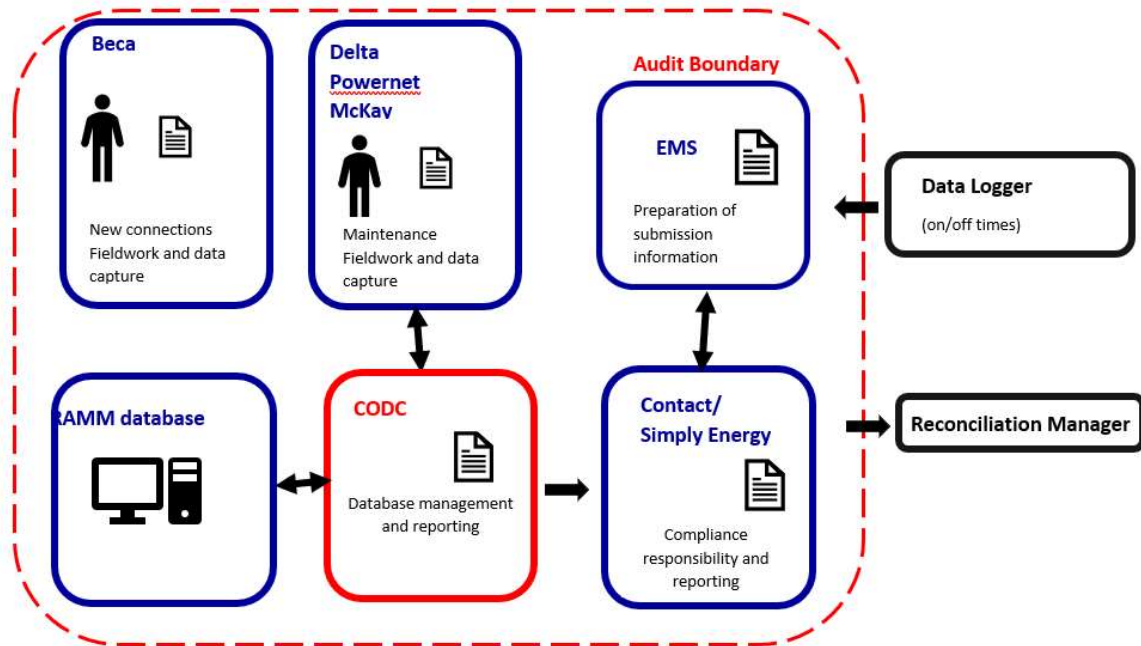
All information was provided directly by Contact or CODC.

1.8. Scope of Audit

This audit of the CODC DUMML RAMM database and processes was conducted at the request of Contact, 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.

This audit includes all streetlights for CODC load as recorded in RAMM.

The RAMM database is managed by CODC and is remotely hosted by thinkproject New Zealand Limited. The field work is carried out mostly by Delta, but also by Powernet and McKay Electrical. The asset data capture and database population are conducted by BECA for new connections and CODC for maintenance. The scope of the audit encompasses the collection, security and accuracy of the data, including the preparation of submission information. The diagram below shows the audit boundary for clarity.



The field audit was undertaken of 234 items of load on 3rd and 4th January 2024.

1.9. Summary of previous audit

The previous audit was completed in May 2023 by Claire Stanley of Veritek Limited. 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	<p>Over submission of an estimated 25,000 kWh per annum due to the hard-wired dimming LED lamps for 83% of the total lamps installed.</p> <p>The data used for submission does not track changes at a daily basis and is provided as a snapshot.</p> <p>Three lamps with incorrect ballast applied resulting in very minor over submission.</p> <p>In absolute terms, total annual consumption is estimated to be 7,200 kWh lower than the DUML database indicates.</p>	Still existing
ICP identifier and items of load	2.2	Clause 11(2)(a) and (aa) of Schedule 15.3	The ICP is not recorded in the database for 16 items of load.	Cleared
All load recorded in database	2.5	11(2A) of Schedule 15.3	Four additional lights were found in the field.	Still existing
Database accuracy	3.1	15.2 and 15.37B(b)	<p>In absolute terms, total annual consumption is estimated to be 7,200 kWh lower than the DUML database indicates.</p> <p>Three lamps with incorrect ballast applied resulting in very minor over submission.</p> <p>New lights are not added to RAMM at the date of electrical connection.</p>	Still existing

Subject	Section	Clause	Non-compliance	Status
Volume information accuracy	3.2	15.2 and 15.37B(c)	<p>Over submission of an estimated 25,000 kWh per annum due to the hard-wired dimming LED lamps for 83% of the total lamps installed.</p> <p>The data used for submission does not track changes at a daily basis and is provided as a snapshot.</p> <p>Three lamps with incorrect ballast applied resulting in very minor over submission.</p> <p>In absolute terms, total annual consumption is estimated to be 7,200 kWh lower than the DUMML database indicates.</p>	Still existing

RECOMMENDATIONS

Subject	Section	Recommendation	Status
Location of each item of load	2.3	Liaise with CODC to obtain better address information to ensure the lights are locatable where GPS co-ordinates are not recorded.	Repeated

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 DUMML database audits are completed:

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

Audit observation

Contact 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.

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 and the application of profiles was checked. The database was checked for accuracy.

Audit commentary

Contact reconciles this DUML load using the DST profile. I checked the submission calculation provided by Contact for November 2023 and it matches the database.

Simply Energy on behalf of Contact send the monthly kW values to EMS. EMS prepare the submission file using the data logger hours to determine the burn hours and the file is then sent to Contact who submit the data under the CTCS code.

The total volume submitted to the Reconciliation Manager is based on a monthly database report derived from RAMM and the “burn time” which is sourced from data loggers. The methodology is compliant.

Examination of the database found one lamp with incorrect ballast applied resulting in very minor over submission of 542 kWh per annum, as detailed in **section 3.1**.

As noted in the previous audit report, CODC have no central management system in place and no plans to install one, but the fittings have fixed dimming for all Betacom lights (1,750 items of load or 80% of all lights) installed on their network. This was part of the night sky initiative in the area. The lights reduce their power consumption to 60% between the hours of midnight to 5am year-round. Currently this is not reflected in the submission volumes. This will be resulting in an estimated annual over submission of 25,000 kWh. New ICPs have been created and it is intended that submission will occur against the new ICPs, using the dimming profile that was approved by the Authority and noted in the previous audit. These will be applied once check meters can be installed, then the volumes will reflect the dimming. This project has not progressed since the previous audit. The next steps for this project are as follows:

- select a suitable MEP to install the check meter,
- arrange for the meter to be installed on a load of at least 100 watts,
- set up a new ICP for the check meter with a status of “inactive - reconciled elsewhere”, and
- develop a process to obtain and use the check meter data output to confirm the on/off times, the start and end of dimming times and the level of dimming.

The field audit indicated that the database was not within the allowable +/-5% variance threshold and is therefore deemed to be inaccurate. This is discussed in **section 3.1**. The error is 20.9% resulting in under submission of 53,500 kWh per annum.

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 data used is a snapshot and this practice is non-compliant.

Audit outcome

Non-compliant

Non-compliance	Description	
<p>Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3</p> <p>From: 01-Jun-23 To: 16-Jan-24</p>	<p>Over submission of an estimated 25,000 kWh per annum due to the hard-wired dimming LED lamps for 80% of the total lamps installed.</p> <p>The data used for submission does not track changes at a daily basis and is provided as a snapshot.</p> <p>One lamp with incorrect ballast applied resulting in very minor over submission of 542 kWh per annum.</p> <p>In absolute terms, total annual consumption is estimated to be 53,500 kWh higher than the DUMML database indicates.</p> <p>Potential impact: High Actual impact: High Audit history: Multiple times previously</p> <p>Controls: Weak Breach risk rating: 9</p>	
Audit risk rating	Rationale for audit risk rating	
<p>High</p>	<p>The controls are rated as weak because the new dimming profile is not being applied and the new connections process requires improvement.</p> <p>The impact is assessed to be high due to the impact of over submission.</p>	
Actions taken to resolve the issue	Completion date	Remedial action status
<p>CODC aiming to have check meter installed for dimming lights in 6 months</p>	<p>01/06/2024</p>	<p>Identified</p>
Preventative actions taken to ensure no further issues will occur	Completion date	
<p>Process steps being sent to CODC outlining actions required to resolve issue</p>	<p>01/02/2024</p>	

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 DUMML database must contain:

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

Audit observation

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

Audit commentary

All relevant items of load have an ICP recorded against them. Two items of load do not have an ICP recorded, because they are NZTA lights recorded in a separate database.

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 the nearest street address, pole numbers and Global Positioning System (GPS) coordinates for most items of load. 65 items of load do not have GPS coordinates or street number recorded. I repeat the previous recommendation that more information is obtained and updated in the database to ensure the lights are easily locatable. The database has a field for "location" which is the distance from the beginning of the street, and which does enable lights to be found.

Recommendation	Description	Audited party comment	Remedial action
Location of each item of load	Liaise with CODC to obtain better address information to ensure the lights are easily locatable where GPS co-ordinates are not recorded.	CODC liaising with their streetlight team to ensure this information is updated	Identified

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 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 fields for the lamp make, model, wattage and the ballast wattage. 51 records have the lamp make and model recorded but not the light make and model. There is sufficient information to determine the wattage, but I recommend the light make and model are also populated so that the exact lights are known in case there is a need to check light specification sheets for any of them.

Description	Recommendation	Audited party comment	Remedial action
Light make and model	Populate the light make and model field for 51 items of load.	CODC liaising with their streetlight team to ensure this information is updated	Identified

The accuracy of the lamp description, capacity and ballasts recorded is discussed 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 234 items of load on 3rd and 4th January 2024.

Audit commentary

The table below summarises the field audit findings. A detailed list was provided to CODC and Contact.

Discrepancy	Quantity
Incorrect wattage	18
In the database not in the field	0
In the field not in the database	15

15 additional items of load were identified in the field of the 234 items of load sampled. This is recorded as a non-compliance below. The database accuracy 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: 01-Jun-23 To: 16-Jan-24	15 additional lights were found in the field. Potential impact: Low Actual impact: Low Audit history: Multiple times previously Controls: Moderate Breach risk rating: 2		
Audit risk rating	Rationale for audit risk rating		
Low	The controls are rated as moderate because they ensure most information is accurate. The impact is assessed to be low due to 15 additional lights found in the field in relation to the overall count of the items of load.		
Actions taken to resolve the issue		Completion date	Remedial action status
CODC liaising with their streetlight team to ensure these lights are added		01/03/2024	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
Regular checking of this information to ensure accuracy		01/03/2024	

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.

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 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

A database extract was provided, and I assessed the accuracy of this by using the DUML Statistical Sampling Guideline. The table below shows the survey plan.

Plan Item	Comments
Area of interest	Central Otago District Council area
Strata	The database contains items of load in the Central Otago district area. The area has two distinct sub regions of urban and rural. The processes for the management of all CODC items of load are the same, but I decided to place the items of load into three strata: <ol style="list-style-type: none"> 1. street name A to E, 2. street name F to O, and 3. street name P to Z
Area units	I created a pivot table of the roads, and I used a random number generator in a spreadsheet to select a total of 62 sub-units.
Total items of load	234 items of load were checked.

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

The process to manage changes made in the field being updated in the database was examined.

Audit commentary

Database accuracy based on the field audit

A field audit was conducted of a statistical sample of 234 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	120.9	Wattage from survey is higher than the database wattage by 20.9%
R _L	110.3	With a 95% level of confidence, it can be concluded that the error could be between +10.3% and +43.6%.
R _H	143.6	

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 B (detailed below) applies.

The conclusion from Scenario B is that the database has poor accuracy demonstrated with statistical significance and means that the true wattage (installed in the field) could be between 10.3% higher and 43.6% higher than the wattage recorded in the DUML database. Non-compliance is recorded because the error is greater than 5.0%.

In absolute terms the installed capacity is estimated to be 13 kW higher than the database indicates.

There is a 95% level of confidence that the installed capacity is between 6kW higher to 26 kW higher than the database.

In absolute terms, total annual consumption is estimated to be 53,500 kWh higher than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 26,300 kWh p.a. higher to 117,700 kWh p.a. higher than the database indicates.

Scenario	Description
A - Good accuracy, good precision	<p>This scenario applies if:</p> <p>(a) R_H is less than 1.05; and</p> <p>(b) R_L is greater than 0.95</p> <p>The conclusion from this scenario is that:</p> <p>(a) the best available estimate indicates that the database is accurate within +/- 5 %; and</p> <p>(b) this is the best outcome.</p>
B - Poor accuracy, demonstrated with statistical significance	<p>This scenario applies if:</p> <p>(a) the point estimate of R is less than 0.95 or greater than 1.05</p> <p>(b) as a result, either R_L is less than 0.95 or R_H is greater than 1.05.</p> <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> <p>(a) the point estimate of R is between 0.95 and 1.05</p> <p>(b) R_L is less than 0.95 and/or R_H is greater than 1.05</p> <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>

I checked that the discrepancies from the previous audit had been resolved and the table below shows that the lamp quantity discrepancies were corrected but not the wattage discrepancies.

Street/Area	Database Count	Field Count	Lamp no. difference	No of incorrect lamp wattage	Comments	Resolved?
Bradford St	2	2		1	1 x 27W LED recorded in the database but 20W LED located in the field.	No
Hazlett St	17	18	+1	1	1 x 17W LED recorded in the database but 1 x 23W LED located in the field	No

Street/Area	Database Count	Field Count	Lamp no. difference	No of incorrect lamp wattage	Comments	Resolved?
					1 additional 17W LED not recorded in the database but located in the field.	Yes
Horace St	4	5	+ 2 -1		1 x 17W LED recorded in the database but not located in the field. 1 additional 125 MH not recorded in the database but located in the field. 1 additional 17W LED not recorded in the database but located in the field.	Yes
Killarney St	15	14	+1 -2		2 x 17W LED recorded in the database but not located in the field 1 additional 17W LED not recorded in the database but located in the field	Yes
Parkburn Lane	2	2		2	2 x 23W LED recorded in the database but 2 x 20W LED located in the field	No
Russell St	10	10		3	3 x 17W LED recorded in the database but 3 x 35W LED located in the field	No
Smithian Drive	7	6	-1	1	1 x 168W LED recorded in the database but 27W LED located in the field. 1x 168W LED recorded in the database but not located in the field.	No
Tarbert St	27	27		1	1 x 17W LED recorded in the database but 1 x 27W LED located in the field	No
Grand Total	192	192	8 (+4,-4)	9		

Lamp description and capacity accuracy

I checked the wattages being applied in the database and found the following errors:

Lamp Make	Database gear wattage	Correct gear wattage	Quantity	Total difference
Metal Halide 140W*	140	13	1	127
Total			1	127

*Check if lamp should be Mercury Vapour 125 W, because the surrounding lights are recorded as this.

The incorrect wattage will be resulting in an estimated very minor over submission of 542 kWh per annum (based on annual burn hours of 4,271 as is detailed in the DUML database auditing tool).

As previously reported, two lamps have an incorrect light model description applied, all other details for the lamp appeared to be correct.

Light Model	Make and model	Wattage
BRP711 LED23/NW 4000K Optic-DWP	Mercury Vapour	125
Mini-Stork 3000K 2550Lumen	HPS	70

Change management process findings

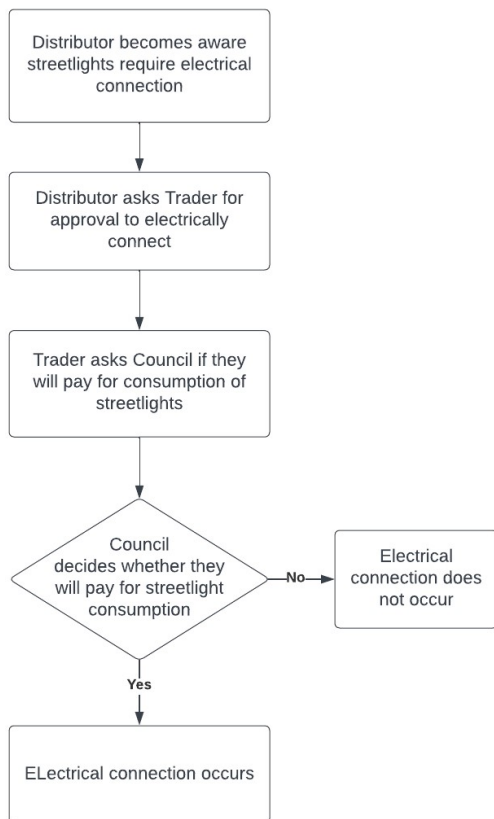
There has not been any change to the field processes, the field contractor is mainly Delta for all fault and maintenance work but Powernet and McKays also perform some work. Contractors are issued a Service Request for reactive work. The RAMM database is updated by the CODC staff with any changes.

Outage patrols are no longer undertaken, lamp outages are notified to CODC by residents, and contractors will be issued a Service Request to resolve.

The new subdivision process requires developers to install LED lights. These must be selected from the approved LED light types specified by NZTA. CODC accept responsibility of these assets upon the 224C being issued. “As-built” plans are expected to be submitted to CODC as part of this process. Currently it can take up to three months post the 224C being issued before the “as built” plans are provided. When the lights are vested to the Council, they are added to RAMM by BECA.

15 of the 33 field audit discrepancies related to newly installed streetlights.

I recommend Contact reviews and strengthens the electrical connection process for new streetlights, in conjunction with CODC and the distributor, to include the following steps:



There are no festive lights connected to the unmetered streetlight circuits. Private lights are not held in the database.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 01-Jun-23 To: 16-Jan-24	In absolute terms, total annual consumption is estimated to be 53,500 kWh higher than the DUML database indicates. Nine incorrect wattages from the last audit not corrected. One lamp with incorrect ballast applied resulting in very minor over submission of 542 kWh per annum. Two incorrect light model descriptions. New lights are not added to RAMM at the date of electrical connection. Potential impact: High Actual impact: High Audit history: Three times previously Controls: Moderate Breach risk rating: 6		
Audit risk rating	Rationale for audit risk rating		
High	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 high due to the kWh impact.		
Actions taken to resolve the issue		Completion date	Remedial action status
CODC aiming to have check meter installed for dimming lights in 6 months		01/06/2024	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
Process steps being sent to CODC outlining actions required to resolve issue		01/02/2024	

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 the ICP has 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

Contact reconciles this DUML load using the DST profile. I checked the submission calculation provided by Contact for November 2023 and it matches the database.

Simply Energy on behalf of Contact send the monthly kW values to EMS. EMS prepare the submission file using the data logger hours to determine the burn hours and the file is then sent to Contact who submit the data under the CTCS code.

The total volume submitted to the Reconciliation Manager is based on a monthly database report derived from RAMM and the “burn time” which is sourced from data loggers. The methodology is compliant.

Examination of the database found one lamp with incorrect ballast applied resulting in very minor over submission of 542 kWh per annum, as detailed in **section 3.1**.

As noted in the previous audit report, CODC have no central management system in place and no plans to install one, but the fittings have fixed dimming for all Betacom lights (1,750 items of load or 80% of all lights) installed on their network. This was part of the night sky initiative in the area. The lights reduce their power consumption to 60% between the hours of midnight to 5am year-round. Currently this is not reflected in the submission volumes. This will be resulting in an estimated annual over submission of 25,000 kWh. New ICPs have been created and it is intended that submission will occur against the new ICPs, using the dimming profile that was approved by the Authority and noted in the previous audit. These will be applied once check meters can be installed, then the volumes will reflect the dimming. This project has not progressed since the previous audit. The next steps for this project are as follows:

- select a suitable MEP to install the check meter,
- arrange for the meter to be installed on a load of at least 100 watts,
- set up a new ICP for the check meter with a status of “inactive - reconciled elsewhere”, and
- develop a process to obtain and use the check meter data output to confirm the on/off times, the start and end of dimming times and the level of dimming.

The field audit indicated that the database was not within the allowable +/-5% variance threshold and is therefore deemed to be inaccurate. This is discussed in **section 3.1**. The error is 20.9% resulting in under submission of 53,500 kWh per annum.

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 data used is a snapshot and this practice is non-compliant.

Audit outcome

Non-compliant

Non-compliance	Description		
<p>Audit Ref: 3.2 Clause 15.2 and 15.37B(c)</p> <p>From: 01-Jun-23 To: 16-Jan-24</p>	<p>Over submission of an estimated 25,000 kWh per annum due to the hard-wired dimming LED lamps for 80% of the total lamps installed.</p> <p>The data used for submission does not track changes at a daily basis and is provided as a snapshot.</p> <p>One lamp with incorrect ballast applied resulting in very minor over submission of 542 kWh per annum.</p> <p>In absolute terms, total annual consumption is estimated to be 53,500 kWh higher than the DUMML database indicates.</p> <p>Potential impact: High Actual impact: High Audit history: Multiple times previously</p> <p>Controls: Weak Breach risk rating: 9</p>		
Audit risk rating	Rationale for audit risk rating		
<p>High</p>	<p>The controls are rated as weak because the new dimming profile is not being applied and the new connections process requires improvement.</p> <p>The impact is assessed to be high due to the impact of over submission.</p>		
Actions taken to resolve the issue		Completion date	Remedial action status
<p>CODC aiming to have check meter installed for dimming lights in 6 months</p>		<p>01/06/2024</p>	<p>Identified</p>
Preventative actions taken to ensure no further issues will occur		Completion date	
<p>Process steps being sent to CODC outlining actions required to resolve issue</p>		<p>01/02/2024</p>	

CONCLUSION

The RAMM database is managed by CODC and is remotely hosted by thinkproject New Zealand Limited. The field work is carried out mostly by Delta, but also by Powernet and McKay Electrical. The asset data capture and database population are conducted by BECA for new connections and CODC for maintenance.

The field audit was undertaken of a statistical sample of 234 items of load in CODC the area on 3rd and 4th January 2024.

The field audit indicated that the database was not within the allowable +/-5% variance threshold and is therefore deemed to be inaccurate. This is discussed in **section 3.1**. The error is 20.9% resulting in under submission of 53,500 kWh per annum. Nine incorrect wattages from the last audit were not corrected.

The total volume submitted to the Reconciliation Manager is based on a monthly database report derived from RAMM, and the “burn time” which is sourced from data loggers. The methodology is compliant.

I checked the submission calculation provided by Contact for November 2023 and it matches the database.

As noted in the previous audit report, CODC have no central management system in place and no plans to install one, but the fittings have fixed dimming for all Betacom lights (1,750 items of load or 80% of all lights) installed on their network. This was part of the night sky initiative in the area. The lights reduce their power consumption to 60% between the hours of midnight to 5am year-round. Currently this is not reflected in the submission volumes. This will be resulting in an estimated annual over submission of 25,000 kWh. New ICPs have been created and it is intended that submission will occur against the new ICPs, using the dimming profile that was approved by the Authority and noted in the previous audit. These will be applied once golden meters can be installed, then the volumes will reflect the dimming. This project has not progressed since the previous audit. The next steps for this project are as follows:

- select a suitable MEP to install the check meter,
- arrange for the meter to be installed on a load of at least 100 watts,
- set up a new ICP for the check meter with a status of “inactive - reconciled elsewhere”, and
- develop a process to obtain and use the check meter data output to confirm the on/off times, the start and end of dimming times and the level of dimming.

The audit found four non-compliances and makes two recommendations. The future risk rating of 25 indicates that the next audit be completed in three months. I have considered this in conjunction with Contact’s comments and recommend that the next audit be completed in six months. This should allow sufficient time to develop processes to account for dimming and to improve the new connections process.

PARTICIPANT RESPONSE

Having a check meter installed to record the correct wattage when lights are dimmed has been on going project for Central Otago District Council, however they are confident this will be achieved within the next six months which will then reduce the audit review period. They are also liaising with the required teams to ensure accuracy of their database is a priority.