

ELECTRICITY INDUSTRY PARTICIPATION CODE  
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

WAIMAKARIRI DISTRICT COUNCIL AND  
CONTACT ENERGY

NZBN: 9429038549977

Prepared by: Steve Woods

Date audit commenced: 21 February 2023

Date audit report completed: 24 March 2023

Audit report due date: 12-May-23

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## EXECUTIVE SUMMARY

This audit of the **Waimakiriri District Council (WDC)** Unmetered Streetlights DUML 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.

WDC is located on the MainPower network. The database is remotely hosted by thinkproject New Zealand Limited. WDC provide a monthly report to Contact from this database.

Contact reconciles this DUML load using the DST profile. The methodology for deriving submission information is compliant. The on and off times were derived from data logger information.

I compared the submission information for the January 2023 submissions and confirmed that the calculation methodology was correct. I checked the submission calculation provided by Contact against the data extract and confirm the submission is accurate.

The field work and asset data capture is conducted by Power Jointing using RAMM Map.

The field audit was undertaken of a statistical sample of 383 items of load on 1 March 2023.

The field audit indicated that the database was within the allowable +/-5% variance threshold and is therefore deemed to be accurate. This is discussed in **section 3.1**.

WDC have resolved a large number of discrepancies that were identified in the previous audit. They have also completed the three recommendations from the previous audit. This audit found there has been an overall improvement to the data completeness and accuracy by WDC, however there is still a smaller number of discrepancies to be corrected.

This audit found five non-compliances and makes no recommendations. The future risk rating of 10 indicates that the next audit be completed in 12 months. I have considered this in conjunction with Contact's comments, I recommend that the next audit be in 18 months.

## 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>Nine items of load do not have lamp wattage or lamp model details recorded; this could result in an estimated under submission of 3,190 kWh per annum.</p> <p>33 items of load have the incorrect wattage applied which could result in an estimated annual over submission of 508 kWh per annum.</p> <p>19 items of load do not have the ballast applied which could result in an estimated annual under submission of 768 kWh per annum.</p>	Moderate	Low	2	Identified
Description and capacity of load	2.4	11(2)(c) & (d) of Schedule 15.3	Nine lights with no lamp description or total wattage recorded resulting in an estimated under submission of 3,190 kWh per annum.	Moderate	Low	2	Identified
All load recorded in database	2.5	11(2A) of Schedule 15.3	Six additional lights found in the field from the 383 items of load sampled.	Moderate	Low	2	Identified

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>Nine lights with no lamp description or total wattage recorded, this could result in an estimated under submission of 3,190 kWh per annum.</p> <p>33 items have the incorrect wattage applied indicating an estimated over submission of 508 kWh per annum.</p> <p>19 items of load do not have the ballast recorded; this could result in an estimated under submission of 768 kWh per annum.</p> <p>Ten items of load with an incorrect ballast of one recorded.</p> <p>11 private lights recorded in the database are not included in monthly reporting to Contact.</p>	Moderate	Low	2	Identified
Volume information accuracy	3.2	15.2 and 15.37B(c)	<p>Nine items of load do not have lamp wattage or lamp model details recorded; this could result in an estimated under submission of 3,190 kWh per annum.</p> <p>33 items of load have the incorrect wattage applied which could result in an estimated annual over submission of 508 kWh per annum.</p> <p>19 items of load do not have the ballast applied which could result in an estimated annual under submission of 768 kWh per annum.</p>	Moderate	Low	2	Identified

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
<b>Future Risk Rating</b>						<b>10</b>	

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

## RECOMMENDATIONS

Subject	Section	Recommendation
		Nil

## 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

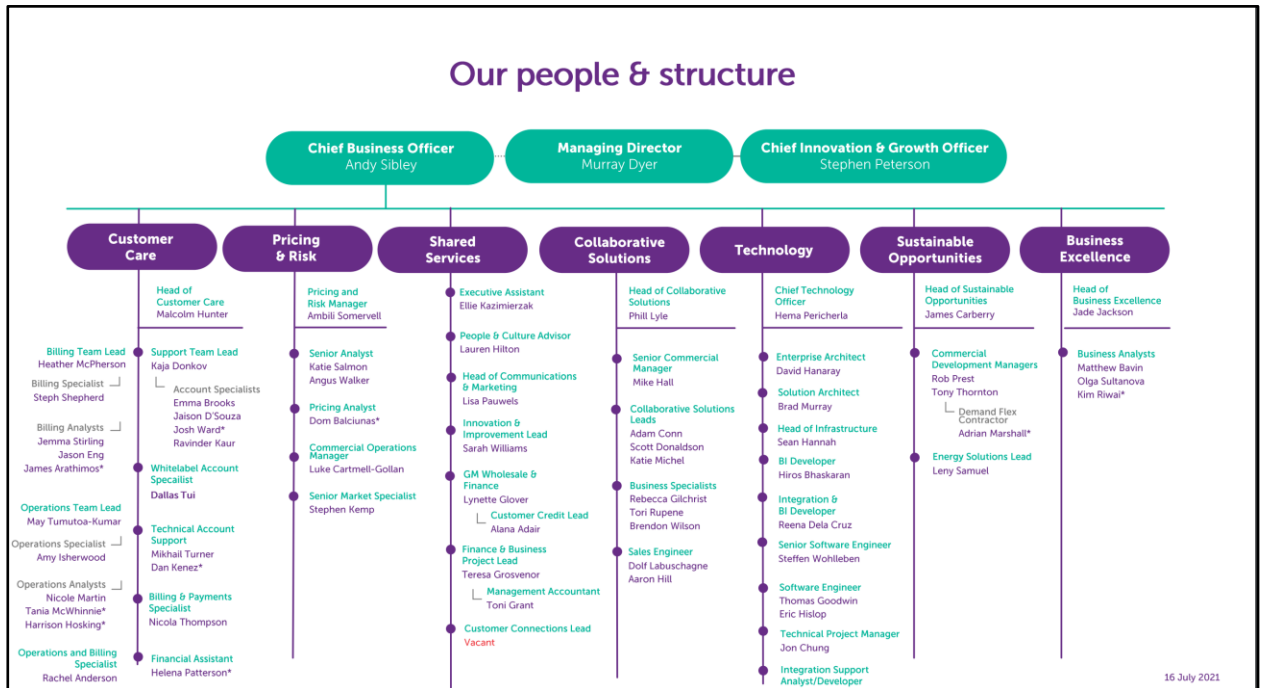
Section 11 of the Electricity Industry Act provides for the Electricity Authority to exempt any participant from compliance with all or any of the clauses.

### Audit commentary

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

## 1.2. Structure of Organisation

Contact provided the relevant organisational structure:



### 1.3. Persons involved in this audit

Auditors:

Name	Company	Role
Steve Woods	Veritek Limited	Lead Auditor
Claire Stanley	Veritek Limited	Supporting 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
Kieran Straw	Civil Projects Team Leader	Waimakariri DC

### 1.4. Hardware and Software

The SQL database used for the management of DUMML 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 DUMML 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 to calculate submissions were 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)
0000366371MPF7B	STREET LIGHT SBK 0331	SBK0331	DST	2,594	260,350.9
0000565850KEA7B	DISTRIBUTED STREETLIGHTING OLD KAIAPOI BOROUGH	KAI0111	DST	495	49,115
0000366372MP3BB	STREET LIGHTING KAI0111	KAI0111	DST	2,935	242,881.3
0000305303MPA1B	STREETLIGHTS ASY0111 WDC	ASY0111	DST	78	9,606



ICP Number	Description	NSP	Profile	Number of items of load	Database wattage (watts)
TOTAL				6,102	561,953.2

The following ICPs were decommissioned during the audit period:

ICP Number	Description	NSP	Decommissioned Date
0000282125MP3EF	STREETLIGHTS SBK0661SWN	SBK0661	20 September 2022
0000328410MP099	STREETLIGHTS SBK0661BHL (Riverlea Estate)	SBK0661BHL	20 September 2022
0000366449MP595	Pegasus Town	KAI0111	20 September 2022

### 1.7. Authorisation Received

All information was provided directly by Contact or Waimakariri District Council.

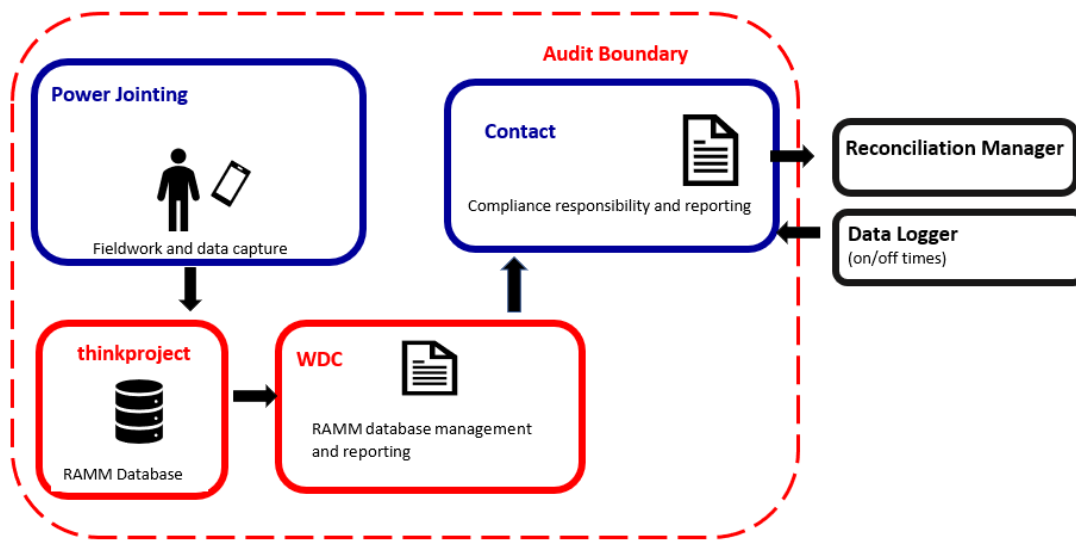
### 1.8. Scope of Audit

This audit of the Waimakariri District Council (WDC) DUML database and processes was conducted at the request of Contact Energy Ltd (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, which became effective on 1 June 2017.

The database is remotely hosted by thinkproject New Zealand Ltd and is managed by WDC, who is Contact's customer. Reporting is provided by WDC to Contact on a monthly basis. The fieldwork and asset data capture are conducted by Power Jointing Limited. 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 flow of information and the audit boundary for clarity.



The field audit was undertaken of a statistical sample of 383 items of load on 1 March 2023.

### 1.9. Summary of previous audit

The previous audit was completed in August 2022 by Steve Woods of Veritek Limited for Contact Energy. Five non-compliances were identified, and three recommendations were made. The statuses of the non-compliances and recommendations are described below.

### Table of Non-Compliance

Subject	Section	Clause	Non-compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	Incorrect submission for two ICPs resulting in an estimated over submission of 2076.82 kWh for the month resulting in an estimated over submission of 24,921.89 kWh per annum.	Cleared
			Database accuracy is outside of the allowable threshold resulting in an estimated over submission of 4,600 kWh per annum.	Cleared
			248 lights with no lamp description or total wattage recorded resulting in an estimated under submission of 81,559 kWh per annum.	Some still remaining
			416 items have the incorrect wattage applied indicating an estimated over submission of 8,429 kWh per annum.	Some still remaining
			Eight lamps recorded as 350W MH, but no such model exists. These are likely to be overstated and therefore over submission will be occurring.	Cleared
			The monthly wattage report provided does not track changes on a daily basis and is provided as a snapshot.	Cleared

Subject	Section	Clause	Non-compliance	Status
Description and capacity of load	2.4	11(2)(c) & (d) of Schedule 15.3	248 lights with no lamp description or total wattage recorded resulting in an estimated under submission of 81,559 kWh per annum.	Some still remaining
All load recorded in database	2.5	11(2A) of Schedule 15.3	Eight additional lights found in the field from the 325 items of load sampled.	Cleared
Database Accuracy	3.1	15.2 and 15.37B(b)	<p>Database accuracy is outside of the allowable threshold resulting in an estimated under submission of 4,600 kWh per annum.</p> <p>248 lights with no lamp description or total wattage recorded, this could result in an estimated under submission of 891,559 kWh p.a.</p> <p>416 items have the incorrect wattage applied indicating an estimated over submission of 8,429 kWh per annum.</p> <p>Eight lamps are recorded as model 350W MH in the database, this not a valid wattage for the lamp type.</p> <p>608 items of load with an incorrect ballast of one recorded.</p>	<p>Cleared</p> <p>Some still remaining</p> <p>Some still remaining</p> <p>Cleared</p> <p>Some still remaining</p>
Volume information accuracy	3.2	15.2 and 15.37B(c)	<p>Incorrect submission for two ICPs resulting in an estimated over submission of 2076.82 kWh for the month resulting in an estimated over submission of 24,921.89 kWh per annum.</p> <p>Database accuracy is outside of the allowable threshold resulting in an estimated under submission of 4,600 kWh per annum.</p> <p>248 lights with no lamp description or total wattage recorded resulting in an estimated under submission of 81,559 kWh per annum.</p> <p>416 items have the incorrect wattage applied indicating an estimated over submission of 8,429 kWh per annum.</p> <p>Eight lamps recorded as 350W MH, but no such model exists. These are likely to be overstated and therefore over submission will be occurring.</p> <p>The monthly wattage report provided does not track changes on a daily basis and is provided as a snapshot.</p>	<p>Cleared</p> <p>Cleared</p> <p>Some still remaining</p> <p>Some still remaining</p> <p>Cleared</p> <p>Cleared</p>

Subject	Section	Recommendation	Status
ICP identifier	2.2	Correct the ICP number recorded incorrectly 000056580KEA7B to 0000565850KEA7B for 479 items of load.	Completed

Location of each item of load	2.3	Populate the road names for the 40 items of load with no street address.	Completed
Description and capacity of load	2.4	Record lamp wattage and ballast values separately.	Completed

#### 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**

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

#### Audit commentary

Contact reconciles this DUML load using the DST profile. The methodology for deriving submission information is compliant. The on and off times were derived from data logger information.

I compared the submission information for the January 2023 submissions and confirmed that the calculation methodology was correct. I checked the submission calculation provided by Contact against the data extract and confirm the submission is accurate.

The field audit indicated that the database was within the allowable +/-5% variance threshold and is therefore deemed to be accurate. This is discussed in **section 3.1**.

Some database content inaccuracies have led to inaccurate volume information as detailed in **sections 2.4** and **3.1**. Specifically:

- nine items of load do not have lamp wattage or lamp model details recorded, this could result in an estimated under submission of 3,190 kWh per annum,
- 33 items of load have the incorrect wattage applied which could result in an estimated annual over submission of 508 kWh per annum,
- 19 items of load do not have the ballast applied which could result in an estimated annual under submission of 768 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 monthly report is provided as a snapshot and additional reporting is provided to Contact with any changes during the period and this tracks the changes at a daily level. Revisions are completed where corrections are required.

#### Audit outcome

Non-compliant

Non-compliance	Description	
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3  From: 28-Jul-22 To: 21-Feb-23	Nine items of load do not have lamp wattage or lamp model details recorded; this could result in an estimated under submission of 3,190 kWh per annum.  33 items of load have the incorrect wattage applied which could result in an estimated annual over submission of 508 kWh per annum.  19 items of load do not have the ballast applied which could result in an estimated annual under submission of 768 kWh per annum.  Potential impact: Medium Actual impact: Medium Audit history: Multiple times previously Controls: Moderate Breach risk rating: 2	
Audit risk rating	Rationale for audit risk rating	
<b>Low</b>	Controls are rated as moderate. The volume of errors occurring has shown an improvement, but there is still further work to be done.  The impact is assessed to be low based on the submission values detailed above.	
Actions taken to resolve the issue	Completion date	Remedial action status
All identified database record discrepancies will be reviewed and corrected where necessary.	30/6/2023	Identified
Preventative actions taken to ensure no further issues will occur	Completion date	
Waimakariri will review whether certain database fields can be made mandatory.	31/12/2023	

## 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 was recorded against each item of load.

### Audit commentary

All items of load have an ICP recorded.

Previously 476 items of load were recorded in the database as 000056580KEA7B, these have all been corrected to 0000565850KEA7B.

#### **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 RAMM database contains a field for the nearest street address and there are GPS coordinates. There are a total of four items of load with no GPS coordinates recorded. The street address was sufficient to locate those.

Previously there were 40 items of load with no street address, they all had GPS co-ordinates recorded so they could be located. The street address has now been populated.

#### **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 make 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**

WDC RAMM database contains the manufacturers lamp model, lamp make, gear wattage and combined wattage. That is a combined value of wattage and ballast for all items of load. The previous audit recommended that the lamp wattages and ballast values are recorded separately. This has been completed for most items of load, there are still 12 items of load where the gear wattage is blank, the combined wattage is correct. 12 items of load do not have the gear wattage recorded and the combined wattage is incorrect.

Nine items of load do not have lamp wattage or lamp model details recorded, previously 248 items of load did not have lamp model and lamp wattage recorded.

This could result in an estimated under submission of 3,190 kWh per annum. The calculation is based on the most common light type of 70W HPS. The accuracy of the recorded wattages is discussed in **section 3.1**.

### Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.4 With: Clause 11(2)(c) & (d) of Schedule 15.3  From: 28-Jul-22 To: 21-Feb-23	Nine lights with no lamp description or total wattage recorded resulting in an estimated under submission of 3,190 kWh per annum. Potential impact: Medium Actual impact: Low Audit history: Multiple times previously Controls: Moderate Breach risk rating: 2		
Audit risk rating	Rationale for audit risk rating		
<b>Low</b>	The controls are recorded as moderate because they mitigate risk most of the time but there is room for further improvement. The impact on settlement and participants is minor; therefore, the audit risk rating is low.		
Actions taken to resolve the issue		Completion date	Remedial action status
All identified database record discrepancies will be reviewed and corrected where necessary.		30/6/2023	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
Waimakariri will review whether certain database fields can be made mandatory.		31/12/2023	

## 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 383 items of load on 1 March 2023.

### Audit commentary

The field audit discrepancies are detailed in the table below:



Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
AKAROA ST	16	16		1	22.3W LED recorded in the database but 28W LED located in the field
CAREW ST	5	5		4	4 x 22.3W LED recorded in the database but 4 x 28W LED located in the field
CLEGG ST	5	5		3	3 x 26W LED recorded in the database but 3 x 20W LED located in the field
HAKARAU RD	10	8	+2, -4	5	5 x 65W LED recorded in the database but 5 x 72W LED located in the field 2 x additional 72W LED not recorded in the database but located in the field 4 x 0 W LED lamps recorded in the database, but not located in the field
PRINCESS PL				1	19W LED recorded in the database but 19.5W LED located in the field
SCHOOL RD WOODEND				1	0 wattage recorded in the database but 1 x 21W LED found in the field
TOM AYERS DR			4	1	4 additional 14W LED not recorded in the database but located in the field 1 x 100W HPS recorded in the database, but LED located on site, no wattage label.
WHITEFIELD ST				11	11 x 22.3 recorded in the database but 11 x 28W LED located in the field
<b>Grand Total</b>	<b>6102</b>	<b>6104</b>	<b>10 (+6, -4)</b>	<b>27</b>	

I found six additional lamps in the field than were recorded in the database and 27 lamps with incorrect wattages of the 383 items of load sampled. The items missing from the database are recorded as non-compliance.

#### Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3  From: 28-Jul-22 To: 21-Feb-23	Six additional lights were found in the field from the 383 items of load sampled.  Potential impact: Medium  Actual impact: Medium  Audit history: Multiple times  Controls: Moderate  Breach risk rating: 2		
Audit risk rating	Rationale for audit risk rating		
<b>Low</b>	Controls are rated as moderate. The volume of errors occurring has shown a slight improvement.  The impact is assessed to be low due to the number of additional lights found in the field.		
Actions taken to resolve the issue		Completion date	Remedial action status
All field service discrepancies identified will be reviewed in the field and corrected where necessary.  NB: The four lights identified on Tom Ayers Drive have not yet been divested to Council and are therefore outside the scope of this audit. We have had previous communications with the Authority regarding the status of lights that are installed by developers within Council boundaries but not yet divested to Council – Until the Council accepts ownership of the lights, we believe this should be the responsibility of the Developer and Network to ensure they are reconciled.		30/6/2023	Identified

## 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 RAMM database contains 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

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	Waimakariri District Council
Strata	The database contains items of load in the Waimakariri District Council area.  The processes for the management of items of load are the same, but I decided to place the items of load into three strata, as follows: <ol style="list-style-type: none"> <li>1. A – G street names,</li> <li>2. H – P street names, and</li> <li>3. Q – Z street names.</li> </ol>
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 38 sub-units.
Total items of load	383 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 to track changes and timeliness of database updates was evaluated.

##### Audit commentary

A field audit was conducted of a statistical sample of 383 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	101.1	Wattage from survey is lower than the database wattage by 1.1%
R <sub>L</sub>	100.2	With a 95% level of confidence, it can be concluded that the error could be between 0.2% and 3.7%
R <sub>H</sub>	103.7	

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 A (detailed below) applies, and the best available estimate indicates that the database is accurate within  $\pm 5.0\%$ .

In absolute terms the installed capacity is estimated to be 6 kW higher than the database indicates.

There is a 95% level of confidence that the installed capacity is between 1 kW and 20 kWh higher than the database.

In absolute terms, total annual consumption is estimated to be 24,600 kWh higher than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 4,000 and 86,700 kWh p.a. higher than the database indicates.

Scenario	Description
<b>A - Good accuracy, good precision</b>	<p>This scenario applies if:</p> <ul style="list-style-type: none"> <li>(a) <math>R_H</math> is less than 1.05; and</li> <li>(b) <math>R_L</math> is greater than 0.95</li> </ul> <p>The conclusion from this scenario is that:</p> <ul style="list-style-type: none"> <li>(a) the best available estimate indicates that the database is accurate within +/- 5 %; and</li> <li>(b) this is the best outcome.</li> </ul>
<b>B - Poor accuracy, demonstrated with statistical significance</b>	<p>This scenario applies if:</p> <ul style="list-style-type: none"> <li>(a) the point estimate of R is less than 0.95 or greater than 1.05</li> <li>(b) as a result, either <math>R_L</math> is less than 0.95 or <math>R_H</math> is greater than 1.05.</li> </ul> <p>There is evidence to support this finding. In statistical terms, the inaccuracy is statistically significant at the 95% level</p>
<b>C - Poor precision</b>	<p>This scenario applies if:</p> <ul style="list-style-type: none"> <li>(a) the point estimate of R is between 0.95 and 1.05</li> <li>(b) <math>R_L</math> is less than 0.95 and/or <math>R_H</math> is greater than 1.05</li> </ul> <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>

### Light description and capacity accuracy

Lamp and gear wattages for all other lamps were compared to the expected values. The last audit identified over 400 incorrect wattages, most of these have now been corrected, the following exceptions were identified:

Model	Database wattage	Correct wattage	Quantity	Total difference
125W MV	137	136	4	-4
160W MV	184	175	8	-72
18W Fluorescent	20	18	6	-12
LEDin 36LED 525mA	60	52	4	-32
RFL530 12LED 700mA 24W	25	24	1	-1

Model	Database wattage	Correct wattage	Quantity	Total difference
Ely C LED	34	33	6	-6
Betacom 7032 Optics 3K 325MA 27W	28	27	2	-2
70W High Pressure Sodium	71	83	1	12
50W High Pressure Sodium	63	61	1	-2
<b>Total</b>			<b>33</b>	<b>-119</b>

This could result in an estimated annual over submission of 508 kWh per annum (based on annual burn hours of 4,271 as is detailed in the DUML database auditing tool).

The following 19 lamps do not have ballast applied:

Model	Database ballast	Correct ballast	Quantity	Total difference
50W High Pressure Sodium	0	11	9	99
70W High Pressure Sodium	0	13	3	39
Cosmopolis 60W lamp	0	6	7	42
<b>Total</b>			<b>19</b>	<b>180</b>

This could result in an estimated annual under submission of 768 kWh per annum (based on annual burn hours of 4,271 as is detailed in the DUML database auditing tool).

As discussed in **section 2.4** nine items of load do not have lamp wattage recorded. If 70W HPS per lamp is applied this could result in an estimated annual under submission of 3,190 kWh per annum (based on annual burn hours of 4,271 as is detailed in the DUML database auditing tool). This is recorded as a non-compliance.

Previously it was reported that 608 items of load had an incorrect ballast of one recorded. Most of these have been corrected in the database, there are still ten lamps with one recorded as ballast. This field is not being used for submission, so this has no effect on submission accuracy but is recorded as non-compliance.

### **Change management process findings**

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

The fault and maintenance work continues to be undertaken by Power Jointing. Power Jointing use RAMM Map for fieldwork unless there is a connectivity issue and in that situation a worksheet will be completed in the field by the technician and updated by Power Jointing in the office.

When new subdivisions or upgrades are conducted, an “as-built” plan is provided, and the lights are added to RAMM. The install date is recorded in RAMM, and WDC are investigating recording the liveness date, to reflect when the lights are vested to WDC.

WDC have a small LED roll-out programme underway, approx. 200 – 300 LEDs will be rolled out per annum. Lights that fail are replaced like for like, this is mainly due to stock supply issues, as it is difficult to get LEDs.

Outage patrols are not conducted, any outages reported to WDC will be assigned to Power Jointing to fix. Pole inspections are on-going and lamp details are checked as part of this process and updated in RAMM if any discrepancies are identified.

#### **Festive lights**

There are some festive lights connected to the Wamakariri DC street light circuits. The lights are not recorded in RAMM but will be included in the monthly report to Contact when electrically connected.

#### **Private lights**

There are 11 private lights recorded in the database, these are currently not included in the monthly reporting provided to Contact. This is recorded as a non-compliance.

#### **Audit outcome**

Non-compliant

Non-compliance	Description		
Audit Ref: 3.1 With: 15.2 and 15.37B(b)  From: 28-Jul-22 To: 21-Feb-23	Nine lights with no lamp description or total wattage recorded, this could result in an estimated under submission of 3,190 kWh per annum. 119 items have the incorrect wattage applied indicating an estimated over submission of 508 kWh per annum. 19 items of load do not have the ballast recorded; this could result in an estimated under submission of 768 kWh per annum. Ten items of load with an incorrect ballast of one recorded. 11 private lights recorded in the database are not included in monthly reporting to Contact. Potential impact: High Actual impact: High Audit history: Multiple times previously Controls: Moderate Breach risk rating: 2		
Audit risk rating	Rationale for audit risk rating		
<b>Low</b>	Controls are rated as moderate. The volume of errors occurring has shown an improvement, but there is still further work to be done.  The impact is assessed to be low based on the submission values detailed above.		
Actions taken to resolve the issue		Completion date	Remedial action status
All identified database record discrepancies will be reviewed and corrected where necessary.		30/6/2023	Identified
Private lights will be included in future reporting/submission		30/4/2023	
Preventative actions taken to ensure no further issues will occur		Completion date	

### 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. The methodology for deriving submission information is compliant. The on and off times were derived from data logger information.

I compared the submission information for the January 2023 submissions and confirmed that the calculation methodology was correct. I checked the submission calculation provided by Contact against the data extract and confirm the submission is accurate.

The field audit indicated that the database was within the allowable +/-5% variance threshold and is therefore deemed to be accurate. This is discussed in **section 3.1**.

Some database content inaccuracies have led to inaccurate volume information as detailed in **sections 2.4 and 3.1**. Specifically:

- nine items of load do not have lamp wattage or lamp model details recorded, this could result in an estimated under submission of 3,190 kWh per annum,
- 33 items of load have the incorrect wattage applied which could result in an estimated annual over submission of 508 kWh per annum,
- 19 items of load do not have the ballast applied which could result in an estimated annual under submission of 768 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 monthly report is provided as a snapshot and additional reporting is provided to Contact with any changes during the period and this tracks the changes at a daily level. Revisions are completed where corrections are required.

#### Audit outcome

Non-compliant

Non-compliance	Description	
<p>Audit Ref: 3.2 With: 15.2 and 15.37B(c)</p> <p>From: 30-Nov-21 To: 27-Jul-22</p>	<p>Nine items of load do not have lamp wattage or lamp model details recorded; this could result in an estimated under submission of 3,190 kWh per annum.</p> <p>33 items of load have the incorrect wattage applied which could result in an estimated annual over submission of 508 kWh per annum.</p> <p>19 items of load do not have the ballast applied which could result in an estimated annual under submission of 768 kWh per annum.</p> <p>Potential impact: Medium Actual impact: Medium Audit history: Multiple times previously Controls: Moderate Breach risk rating: 4</p>	
Audit risk rating	Rationale for audit risk rating	
<p><b>Low</b></p>	<p>Controls are rated as moderate. The volume of errors occurring has shown an improvement, but there is still further work to be done.</p> <p>The impact is assessed to be low based on the submission values detailed above.</p>	
Actions taken to resolve the issue	Completion date	Remedial action status
<p>All identified database record discrepancies will be reviewed and corrected where necessary.</p>	<p>30/6/2023</p>	<p>Identified</p>
Preventative actions taken to ensure no further issues will occur	Completion date	

## CONCLUSION

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

WDC is located on the MainPower network. The database is remotely hosted by thinkproject New Zealand Limited. WDC provide a monthly report to Contact from this database.

Contact reconciles this DUML load using the DST profile. The methodology for deriving submission information is compliant. The on and off times were derived from data logger information.

I compared the submission information for the January 2023 submissions and confirmed that the calculation methodology was correct. I checked the submission calculation provided by Contact against the data extract and confirm the submission is accurate.

The field work and asset data capture is conducted by Power Jointing using RAMM Map.

The field audit was undertaken of a statistical sample of 383 items of load on 1 March 2023.

The field audit indicated that the database was within the allowable +/-5% variance threshold and is therefore deemed to be accurate. This is discussed in **section 3.1**.

WDC have resolved a large number of discrepancies that were identified in the previous audit. They have also completed the three recommendations from the previous audit. This audit found there has been an overall improvement to the data completeness and accuracy by WDC, however there is still a smaller number of discrepancies to be corrected.

This audit found five non-compliances and makes no recommendations. The future risk rating of 10 indicates that the next audit be completed in 12 months. I have considered this in conjunction with Contact's comments, I recommend that the next audit be in 12 months.

## PARTICIPANT RESPONSE

Waimakariri have completed a huge amount of work between audits which is reflected in the dramatic improvement of their score. They have committed to continue working through the remaining non-compliances and we have full faith that this will be reflected in the next audit.