

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

For

**TAURANGA CITY COUNCIL AND  
TRUSTPOWER LIMITED  
NZBN:9429038917912**

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Date audit commenced: 15 November 2021

Date audit report completed: 25 November 2021

Audit report due date: 27 November 2021

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## EXECUTIVE SUMMARY

This audit of the **Tauranga City Council (TCC)** DUMML 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 DUMML audits version 1.1.

The field audit found the database was accurate to within +/- 5%. There were 27 incorrect wattages identified and they have all been updated. One additional light was found, and this has been added to the database. No database errors or blank fields were identified.

A recommendation is made regarding the notification of livening dates to TCC to ensure the correct dates are recorded.

Trustpower has resolved all of the submission related issues from the previous audit.

The future risk rating of two indicates that the next audit be completed in 24 months. I agree with this recommendation.

The matters raised are detailed below:

## AUDIT SUMMARY

### NON-COMPLIANCES

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
All load recorded in database	2.5	11(2A) of Schedule 15.3	One additional items of load found in the field which were not recorded in the database.	Moderate	Low	2	Cleared
Future Risk Rating						30	

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	Description	Remedial Action
Livening dates	3.1	Liaise with Powerco to ensure livening date notifications are made to TCC so the database can be updated accurately.	Powerco contracted – they will review their process.

### 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

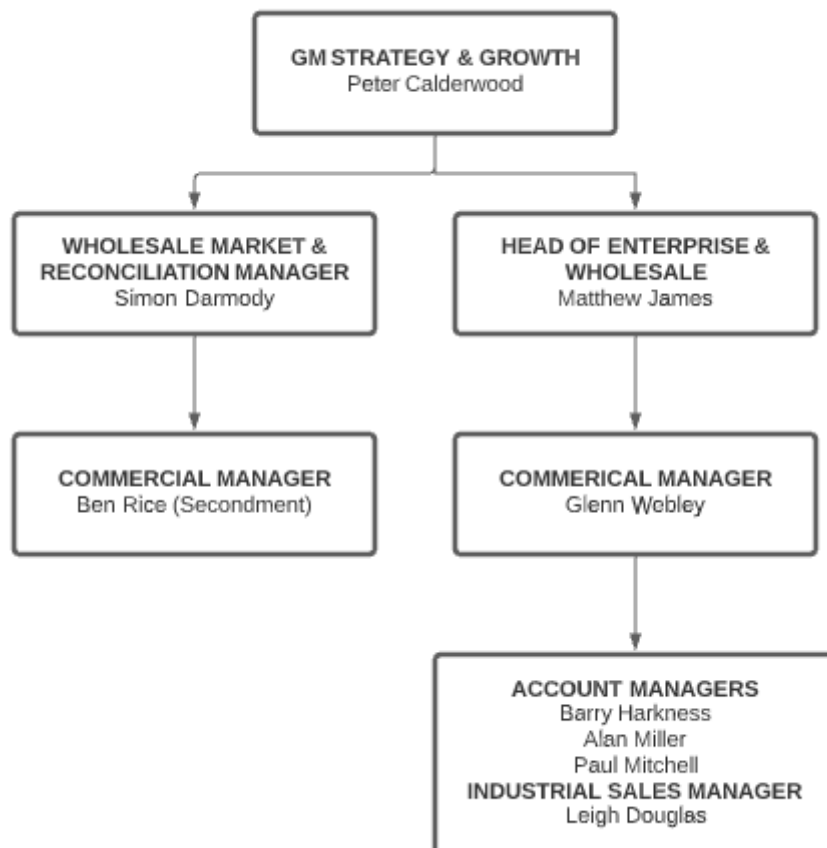
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

#### 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:

**Steve Woods**

**Veritek Limited**

**Electricity Authority Approved Auditor**

Other personnel assisting in this audit were:

Name	Title	Company
Robbie Diederer	Reconciliation Analyst	Trustpower
Michael Jones	Traffic Systems Engineer	TCC

### 1.4. Hardware and Software

The RAMM database used for the management of DUML is managed by TCC.

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)
0000001002UHFFF	Tuihana	GRE0111	STL	9	207
0000001100UH67E	Tuihana -LED CMS	GRE0111	CMS	118	4,602
0001264711UNDB5	Tauranga District Council Streetlights (TGA11)	TGA0111	STL	259	15,450
1000559933PC0F9	Tauranga District Council Streetlights (KMO)	KMO0331	STL	196	15,084
1000559934PCD33	Tauranga District Council Streetlights (TGA33)	TGA0331	STL	443	32,937
1000559935PC176	Tauranga District Council Streetlights (MTM)	MTM0331	STL	398	20,267

ICP Number	Description	NSP	Profile	Number of items of load	Database wattage (watts)
1000581494PC175	Tauranga District Council Streetlights (MTM)- LED- CMS	TGA0111	CMS	1,736	76,514
1000581495PCD30	Tauranga District Council Streetlights (TGA33)- LED - CMS	TGA0331	CMS	3,523	190,051
1000581497PCDB5	Tauranga District Council Streetlights (KMO)- LED- CMS	KMO0331	CMS	2,382	126,576
1000581498PC26B	Tauranga District Council Streetlights (MTM)-LED-CMS	MTM0331	CMS	3,758	232,293
1000583119PCD21	Tauranga District Council Streetlights (TMI)	TMI0331	STL	207	8,004
1000583125PC9C7	Tauranga District Council Streetlights (TMI) -LED-CMS	TMI0331	CMS	881	48,184
Total				13,910	770,167

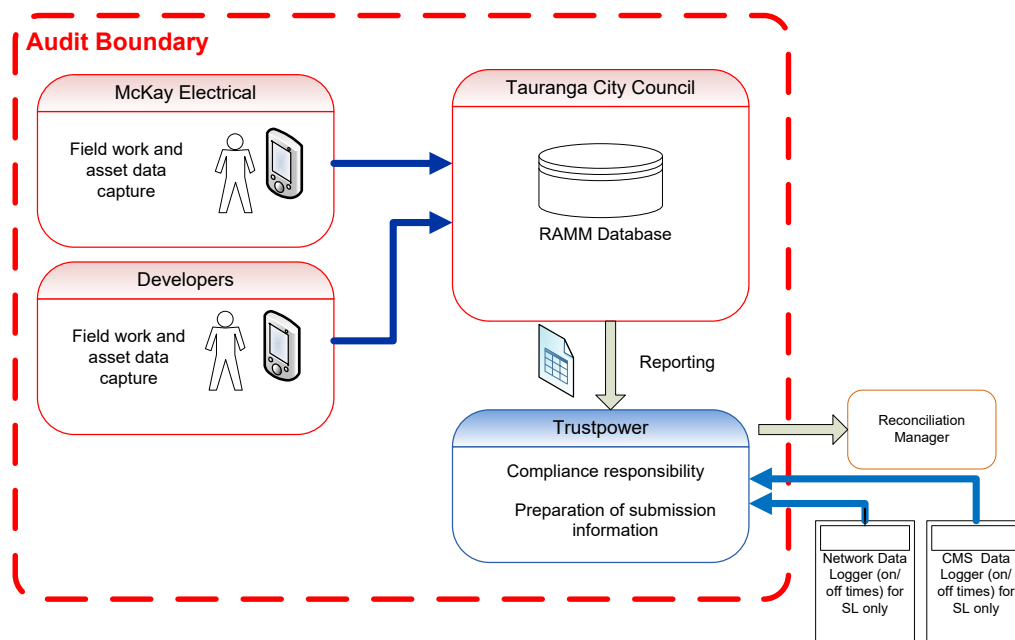
#### 1.7. Authorisation Received

All information was provided directly by Trustpower and TCC.

## 1.8. Scope of Audit

The database used for submission is managed by TCC. The field work and asset data capture is conducted by McKay Electrical and they update the TCC RAMM database using “Pocket RAMM”. Reporting is provided to Trustpower on a monthly basis.

The diagram below shows the current flow of information and the audit boundary for clarity.



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

The field audit was carried out of 419 items of load on November 15<sup>th</sup>, 2021.

## 1.9. Summary of previous audit

The previous audit was completed in December 2020 by Rebecca Elliot of Veritek. Four non-compliances were identified, and no recommendations were made. The table below shows the current status of the issues raised, which were cleared for the specific points raised.

Subject	Section	Clause	Non-compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	<p>Inaccurate submission due to the incorrect profile being applied for four ICPs and the incorrect burn hours being applied for five ICPs. This is estimated to have resulted in a total under submission of 4,649.86 kWh submission for the month of September 2020.</p> <p>Database accuracy is outside the allowable threshold and indicates a potential under submission of 214,500 kWh per annum due to new items of load are not being added to the database in a timely manner in all instances.</p> <ul style="list-style-type: none"> <li>One incorrect gear wattage applied of 18W instead of 14W.</li> </ul>	Cleared

Subject	Section	Clause	Non-compliance	Status
All load recorded in database	2.5	11(2A) of Schedule 15.3	45 x additional items of load found in the field which were not recorded in the database.	Cleared
Database accuracy	3.1	15.2 and 15.37B(b)	Database accuracy is outside the allowable threshold and indicates a potential under submission of 214,500 kWh per annum due to new items of load are not being added to the database in a timely manner in all instances.  One incorrect gear wattage applied of 18.	Cleared
Volume information accuracy	3.2	15.2 and 15.37B(c)	Inaccurate submission due to the incorrect profile being applied for four ICPs and the incorrect burn hours being applied for five ICPs. This is estimated to have resulted in a total under submission of 4,649.86 kWh submission for the month of September 2020.  Database accuracy is outside the allowable threshold and indicates a potential under submission of 214,500 kWh per annum due to new items of load are not being added to the database in a timely manner in all instances.  One incorrect gear wattage applied of 18W instead of 14W.	Cleared

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

##### Code reference

*Clause 16A.26 and 17.295F*

##### Code related audit information

*Retailers must ensure that 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

Trustpower have requested Veritek to undertake this DUMML 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 for six ICPs and the CMS profile for six ICPs. The submissions were checked and found to be correct for all ICPs. The issue from the previous audit where the incorrect hours were used for the CMS profile is now resolved.

#### CMS profile

The load for these items of load are switched by the TCC Central Management System (Street Vision) and the on and off times are used to create the shape file. These are collected from a data storage device used to record the on/off times from a sample fitting.

#### STL Profile

The on/off times for the STL profile are derived from a data logger recording Powerco's on/off ripple control signals.

The field audit found the database was accurate to within +/- 5%, which is deemed compliant.

Changes made to lights during the month are taken into account and applied from the date of the light change. Additions to the database are added effective from the date of the light installation.

#### Audit outcome

Compliant

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

#### **Audit commentary**

An ICP is recorded for all items 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 DUMML database must contain the location of each DUMML item.*

#### **Audit observation**

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

#### **Audit commentary**

The database contains fields for GPS coordinates, the nearest street address including the distance from the end of the road. This data is complete and accurate; there are no blanks, and the field audit confirmed the accuracy of location information.

#### **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 RAMM 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**

The database contains fields for lamp description, wattage and gear wattage. The entire database was checked, and all were populated. The accuracy of these are 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

A field audit of a statistical sample of 419 items of load recorded in the RAMM database was undertaken. The total population was divided into four strata detailed in **section 3.1**.

### Audit commentary

The field audit findings are detailed in the table below.

Discrepancy	Quantity	Comments
Incorrect wattage	27	These are all now updated
Light on Parau drive not in database	1	This has now been added

This section is concerned with items of load in the field but not in the database. There was one example, which is recorded as non-compliance.

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

### Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3  From: 01-Nov-20 To: 16-Nov-21	One additional items of load found in the field which were not recorded in the database.  Potential impact: High Actual impact: Low Audit history: Multiple times Controls: Moderate Breach risk rating: 2		
Audit risk rating	Rationale for audit risk rating		
<b>Low</b>	The controls are rated as moderate as there is room for improvement for the adding of new load.  The impact is rated as low because only one example was identified.		
Actions taken to resolve the issue		Completion date	Remedial action status
Customer has added the missing lamp to the database and rectified the incorrect wattages.		Immediately	Cleared
Preventative actions taken to ensure no further issues will occur		Completion date	

Database reviewed and validated.	24/11/21	
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## 2.6. Tracking of load changes (Clause 11(3) of Schedule 15.3)

### Code reference

*Clause 11(3) of Schedule 15.3*

### Code related audit information

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

### Audit observation

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

### Audit commentary

The RAMM database functionality achieves compliance with the code.

### Audit outcome

Compliant

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

### Code reference

*Clause 11(4) of Schedule 15.3*

### Code related audit information

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

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

### Audit observation

The database was checked for audit trails.

### Audit commentary

The RAMM database contains a complete audit trail of all additions and changes.

### 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	Tauranga City Council region
Strata	The database contains items of load in the Tauranga City area. The processes for the management of all TCC items of load are the same, but I decided to place the items of load into four strata, as follows: <ol style="list-style-type: none"><li>1. A to D,</li><li>2. E to L,</li><li>3. M to Q, and</li><li>4. R to Z</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 48 sub-units.
Total items of load	419 items of load were checked.

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

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

##### Audit commentary

##### Field audit findings

A field audit was conducted of a statistical sample of 419 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	100.5	Wattage from survey was found to be .05% higher than the wattage recorded in the database.
R <sub>L</sub>	102.1	With a 95% level of confidence, it can be concluded that the error could be between +2.1% and -0.2%
R <sub>H</sub>	99.8	
R <sub>H</sub>	112.6	

These results were categorised in accordance with the “Distributed Unmetered Load Statistical Sampling Audit Guideline”, effective from 01/02/19. The table below shows that Scenario A (detailed below) applies.

The conclusion from Scenario A is that the database is accurate to within +/- 5%.

In absolute terms the installed capacity is estimated to be 4 kW more than the database indicates.

There is a 95% level of confidence that the installed capacity is between 1 kW lower to 17 kW higher than the database.

In absolute terms, total annual consumption is estimated to be 17,100 kWh higher than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 5,000 lower and 71,600 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

As discussed in **section 2.4**, all lights have a lamp and gear wattage recorded. Lamp and gear wattages were compared to the expected values. All were found to be correct. The field audit identified 27 incorrect wattages (Refer page 11, These are all now updated), but the error is within +/- 5% and therefore the database is deemed to be accurate.

### ICP number accuracy

As detailed in **section 2.2**, an ICP is recorded for all items of load.

### Change management process findings

McKay Electrical has the maintenance contract for streetlights and data is entered directly into the RAMM database via pocket RAMM. McKay Electrical submits Service Orders immediately after the work has been completed and this is in turn checked by Tauranga City Council to validate the claims.

Historically, it has been found that new streetlights are not being added to the database in a timely manner. The process was discussed and it appears that there is still sometimes a delay from the time the items of load are livened and getting these added to the database. No specific examples were identified, but I recommend Trustpower liaises with Powerco to ensure livening dates are supplied to TCC.

Recommendation	Description	Audited party comment	Remedial action
Livening notification	Liaise with Powerco to ensure livening date notifications are made to TCC so the database can be updated accurately.	Powerco advised and will review their process	Identified

### Audit outcome

Compliant

## 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 for six ICPs and the CMS profile for six ICPs. The submissions were checked and found to be correct for all ICPs. The issue from the previous audit where the incorrect hours were used for the CMS profile is now resolved.

#### CMS profile

The load for these items of load are switched by the TCC Central Management System (Street Vision) and the on and off times are used to create the shape file. These are collected from a data storage device used to record the on/off times from a sample fitting.

#### STL Profile

The on/off times for the STL profile are derived from a data logger recording Powerco's on/off ripple control signals.

The field audit found the database was accurate to within +/- 5%, which is deemed compliant.

Changes made to lights during the month are taken into account and applied from the date of the light change. Additions to the database are added effective from the date of the light installation.

#### **Audit outcome**

Compliant



## CONCLUSION

The field audit found the database was accurate to within +/- 5%. There were 27 incorrect wattages identified and they have all been updated. One additional light was found, and this has been added to the database. No database errors or blank fields were identified.

A recommendation is made regarding the notification of livening dates to TCC to ensure the correct dates are recorded.

Trustpower has resolved all of the submission related issues from the previous audit.

The future risk rating of two indicates that the next audit be completed in 24 months. I agree with this recommendation.

## PARTICIPANT RESPONSE

Customer has rectified all discrepancies with the database and Powerco advised to review process for notifying TCC with livening dates.