

ELECTRICITY INDUSTRY PARTICIPATION CODE  
DISTRIBUTED UNMETERED LOAD AUDIT REPORT



For

HASTINGS DISTRICT COUNCIL AND  
MANAWA ENERGY

NZBN: 9429038917912

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Audit report due date: 01-Jun-24

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## EXECUTIVE SUMMARY

This audit of the by **Hastings District Council (HDC)**, DUML database and processes was conducted at the request of **Manawa Energy Limited (Manawa)**, 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.

Hastings DC switched to Manawa Energy on 1 March 2024.

The database is remotely hosted by thinkproject New Zealand Ltd. For streetlights, the database population, field work and asset data capture are conducted by Pope Electrical. Database management is undertaken by Beca. Parks and Amenity lights are also recorded in the database. Changes made in the field are expected to be advised to the Transport team. I have repeated the recommendation from the last audit that this process is reviewed to ensure that changes are captured as expected.

As noted in the last two audits, Hastings DC has implemented a CMS system. This will interface with RAMM. 60% of the lights on and off times are controlled by the CMS. The on and off times are pre-programmed based on sunset and sunrise times. This is likely to vary slightly from the Unison controlled ripple relays. HDC were unclear if there is any static dimming in use and I recommend that this is investigated to confirm.

HDC do intend to use dimming in the future and are still working on the data issues that need to be resolved before the CMS system can be used to derive streetlight volumes. Once this is resolved, Manawa will work with HDC to progress a profile before dimming is deployed. The inaccurate on and off times are recorded as non-compliance.

As was found in the last audit, there are differences in the light volumes recorded and therefore the submission values between the database extract and the monthly wattage report being provided to Manawa. As HDC has only recently switched into Manawa, I was unable to determine if the differences relate to Waka Kotahi lights being recorded against the incorrect ICP or not. This has been passed to Manawa to investigate with HDC and I have repeated the recommendation from the last audit to maintain visibility. This could be resulting in incorrect submissions.

The database accuracy analysis fell just outside of the allowable +/-5% threshold. This appears to have improved from the last audit, but I note that the random selection did not include many Parks and Amenity lights when compared to the last sample. These lights were found to have a high level of error in the last audit. Database accuracy is described as follows:

Result	Percentage	Comments
The point estimate of R	101.1	Wattage from survey is higher than the database wattage by 1.1%
R <sub>L</sub>	98.0	With a 95% level of confidence, it can be concluded that the error could be between -2% and +5.7%
R <sub>H</sub>	105.7	

In absolute terms, total annual consumption is estimated to be 19,700 kWh higher than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 39,100 kWh lower to 111,900 kWh p.a. higher than the database indicates.

The audit found four non-compliances and five recommendations are made. The future risk rating of 14 indicates that the next audit be completed in 12 months. I have considered Manawa's comments and as:

- the submission value differences between the database extract and the monthly wattage report being provided still exist,
- being unable to confirm if process improvements recommended in the last audit have been adopted, and
- the database changing traders just prior to this audit being due,

I recommend that the next audit be in no more than 12 months time.

The matters raised are detailed in the tables 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>Very minor over submission of 2.99kWh for ICP 0000045104HB052 for the month of March 2024.</p> <p>Potential under submission of 7,614 kWh for the month of March 2024.</p> <p>Database assessed as having poor precision therefore the potential error is greater than 5.0% resulting in an estimated under submission of 19,700 kWh per annum.</p> <p>Ten items of load with the incorrect ballast applied resulting in a very minor estimated over submission of 174.3 kWh per annum.</p> <p>Inaccurate on and off times as the logger times will vary slightly from the CMS on and off times.</p>	Moderate	Medium	4	Investigating
All load recorded in the database	2.5	11(2A) of Schedule 15.3	Six additional lights identified in the field audit.	Moderate	Low	2	Investigating

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Database accuracy	3.1	15.2 and 15.37B(b)	<p>Database assessed to have poor precision therefore the potential error is greater than 5% resulting in an estimated under submission of 19,700 kWh per annum.</p> <p>Ten items of load with the incorrect ballast applied resulting in a very minor estimated over submission of 174.3 kWh per annum.</p>	Moderate	Medium	4	Investigating
Volume information accuracy	3.2	15.2 and 15.37B(c)	<p>Very minor over submission of 2.99kWh for ICP 0000045104HB052 for the month of March 2024.</p> <p>Potential under submission of 7,614 kWh for the month of March 2024.</p> <p>Database assessed as having poor precision therefore the potential error is greater than 5.0% resulting in an estimated under submission of 19,700 kWh per annum.</p> <p>Ten items of load with the incorrect ballast applied resulting in a very minor estimated over submission of 174.3 kWh per annum.</p> <p>Inaccurate on and off times as the logger times will vary slightly from the CMS on and off times.</p>	Moderate	Medium	4	Investigating
<b>Future Risk Rating</b>						<b>14</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	Description
Deriving submission information	2.1	Review database extract provided with the equivalent monthly report to identify why there are discrepancies.
		Check CMS to confirm if any lights are statically dimmed and adjust light wattages in RAMM accordingly.
Database accuracy	3.1	Review LED light descriptions to ensure that the wattage can be confirmed as correctly applied.
		Review new streetlight connection process to ensure that these are captured correctly.
		Review change management process for Parks and Amenity lighting to ensure changes made in the field are updated in the database.

## 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

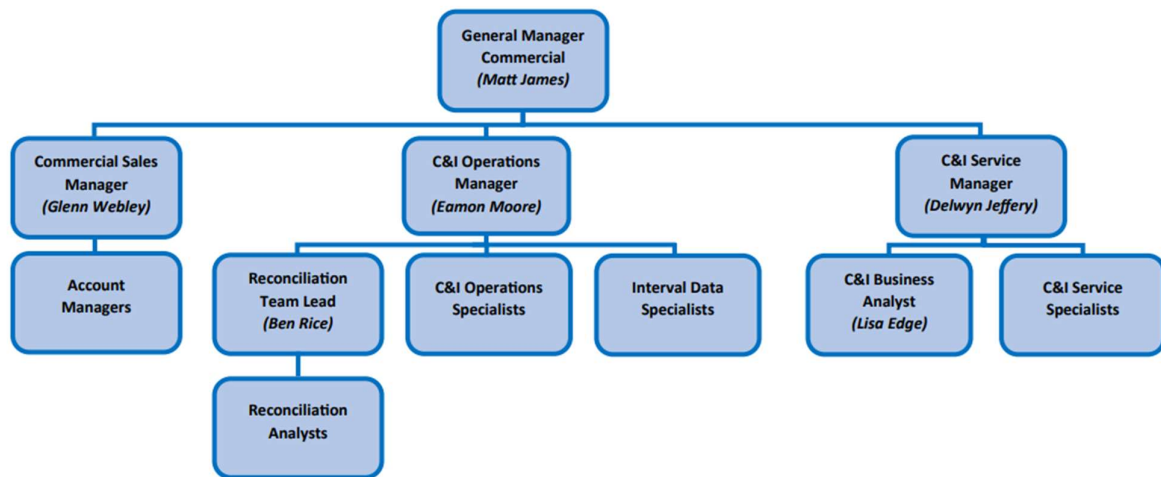
Section 11 of the Electricity Industry Act provides for the Electricity Authority to exempt any participant from compliance with all or any of the clauses.

#### Audit commentary

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

### 1.2. Structure of Organisation

Manawa provided the relevant organisational structure:





### 1.3. Persons involved in this audit

Auditors:

Name	Title	Company
Rebecca Elliot	Auditor	Veritek Ltd

Other personnel assisting in this audit were:

Name	Title	Company
Lisa Edge	Business Analyst – Commercial and Industrial	Manawa Energy
Eamon Moore	C & I Operations Manager	Manawa Energy
Jag Pannu	Transportation Manager	Hastings DC
Tyler Young	Transportation Officer - Cadet	Hastings DC

### 1.4. Hardware and Software

The RAMM database used for the management of DUML is remotely hosted by thinkproject New Zealand Ltd.

HDC have deployed a CMS system called Bright City CMS from Telematics Wireless. This is used to turn the streetlights on and off. The Parks and Amenity lighting is not in the CMS. It is expected that the CMS system will be used to dim the streetlights in the future. This system is supported locally by Techlight.

HDC confirmed that the RAMM database and the Bright City CMS system are backed up in accordance with standard industry procedures. Access to the systems 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)
0000939902HBFF4	STREETLIGHTING MASTER ICP - FHL0331	FHL0331	STL	2,848	162,155
0000939904HBE7B	STREETLIGHTS - RURAL MASTER ICP - FHL0331	FHL0331	STL	111	11,225
0000045106HB0D7	STREETLIGHTING MASTER ICP - RDF0331	RDF0331	STL	17	1,800
0000045104HB052	STREETLIGHTING MASTER ICP - WTU0331	WTU0331	STL	4,619	295,178
0000045107HBC92	STREETLIGHTS - RURAL MASTER ICP - RDF0331	RDF0331	STL	79	4,499
0000045105HBC17	STREETLIGHTS - RURAL MASTER ICP - WTU0331	WTU0331	STL	54	2,415
<b>TOTAL</b>				<b>7,728</b>	<b>477,271</b>

## 1.7. Authorisation Received

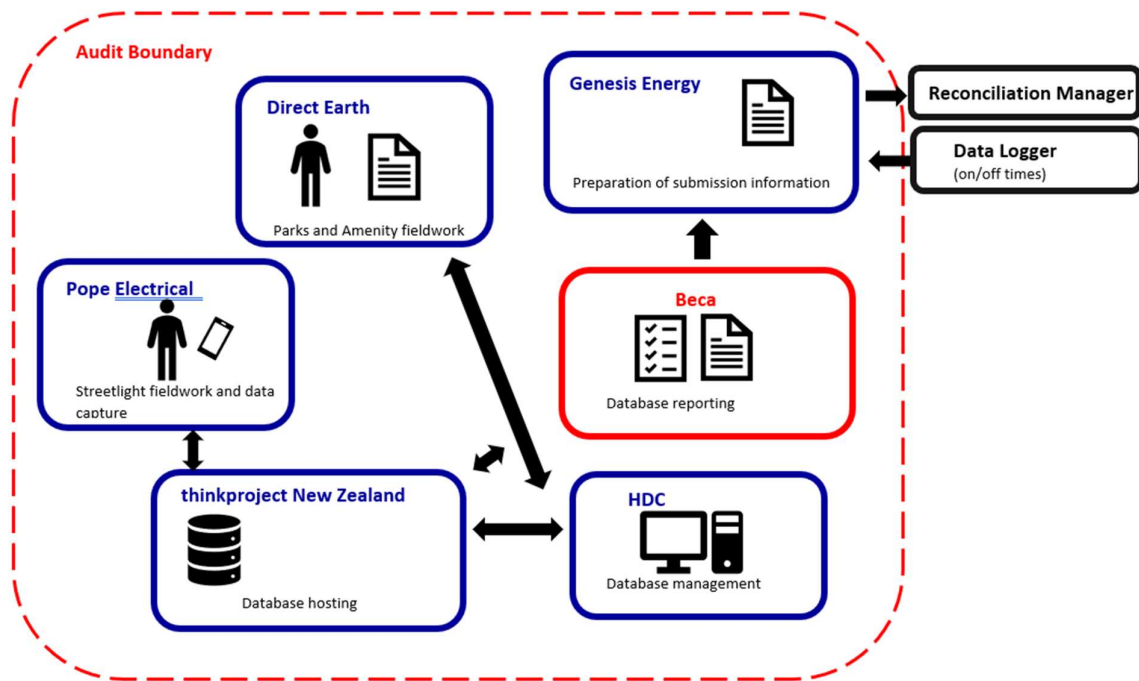
All information was provided directly by Manawa and HDC.

## 1.8. Scope of Audit

This audit of the HDC DUML database and processes was conducted at the request of Manawa, in accordance with clause 15.37B. The purpose of this audit is to verify that the volume information is being calculated accurately, and that profiles have been correctly applied.

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

The database is remotely hosted by thinkproject New Zealand Ltd. The database population and field work are conducted by Pope Electrical for streetlights. The monthly wattage report is produced by Beca Limited on behalf of HDC. Parks and Amenity lights are also recorded in the database. Changes made in the field are expected to be advised to the Transport Department. The scope of the audit encompasses the collection, security and accuracy of the data, including the preparation of submission information based on the database reporting. The diagram below shows the audit boundary for clarity.



The field audit was undertaken of 381 items of load on 14 May 2024.

### 1.9. Summary of previous audit

I reviewed the last audit report undertaken by Rebecca Elliot of Veritek Limited in July 2023. The table below records the current status of the relevant clauses:

#### Table of Non-Compliance

Subject	Section	Clause	Non-compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	Database assessed as having poor precision therefore the potential error is greater than 5.0% resulting in an estimated under submission of 85,600 kWh per annum.	Still existing
			36 items of load with no wattage recorded resulting in an under submission of 2,998 kWh per annum based on the most common lamp wattage of 19.5W.	Cleared
			12 items of load with the incorrect ballast applied resulting in a very minor under submission of 64.9kWh per annum.	Not repeated
			57 items of load with no ICP associated resulting in an estimated under submission of 6,750 kWh additional lights identified in the field count. Inaccurate on and off times as the logger times will vary slightly from the CMS on and off times.	Cleared

Subject	Section	Clause	Non-compliance	Status
ICP identifier	2.2	11(2)(a) and (aa) of Schedule 15.3	57 items of load with no ICP associated resulting in an estimated under submission of 6,750 kWh additional lights identified in the field count.	Cleared
Description and capacity of load	2.4	11(2)(c) and (d) of Schedule 15.3	36 items of load with no wattage recorded resulting in an estimated under submission of 2,998 kWh per annum based on the most common lamp wattage of 19.5W.	Cleared
All load recorded in the database	2.5	11(2A) of Schedule 15.3	Four additional lights identified in the field count.	Still existing
Database accuracy	3.1	15.2 and 15.37B(b)	<p>Database assessed as having poor precision therefore the potential error is greater than 5.0% resulting in an estimated under submission of 85,600 kWh per annum.</p> <p>36 items of load with no wattage recorded resulting in an under submission of 2,998 kWh per annum based on the most common lamp wattage of 19.5W.</p> <p>12 items of load with the incorrect ballast applied resulting in a very minor under submission of 64.9kWh per annum.</p> <p>57 items of load with no ICP associated resulting in an estimated under submission of 6,750 kWh additional lights identified in the field count.</p>	<p>Still existing</p> <p>Cleared</p> <p>Not repeated</p> <p>Cleared</p>
Volume information accuracy	3.2	15.2 and 15.37B(c)	<p>Database assessed as having poor precision therefore the potential error is greater than 5.0% resulting in an estimated under submission of 85,600 kWh per annum.</p> <p>36 items of load with no wattage recorded resulting in an under submission of 2,998 kWh per annum based on the most common lamp wattage of 19.5W.</p> <p>12 items of load with the incorrect ballast applied resulting in a very minor under submission of 64.9kWh per annum.</p> <p>57 items of load with no ICP associated resulting in an estimated under submission of 6,750 kWh additional lights identified in the field count.</p> <p>Inaccurate on and off times as the logger times will vary slightly from the CMS on and off times.</p>	<p>Still existing</p> <p>Cleared</p> <p>Not repeated</p> <p>Cleared</p> <p>Still existing</p>

## 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**

Manawa 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

Manawa reconciles this DUML load using the STL profile. 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 a data logger.

I checked the submission calculation provided by Manawa for March 2024 and found the calculation was correct for all but one of the ICPs from the information provided by HDC. The calculation for ICP 0000045104HB052 was 2.99kWh’s lower than the calculated volume submitted by Manawa. This has been passed to Manawa to investigate and is recorded as non-compliance below.

I checked the volumes against the database extract provided and found light count and volume difference between the monthly report provided to Manawa for four of the six ICPs:

ICP	Manawa light fittings	HDC database extract light fittings	Net light count difference	Calculated kWh volume difference for March 2024
0000939902HBFF4	2,721	2,848	127	2,792
0000939904HBE7B	89	111	22	835
0000045104HB052	4,535	4,619	84	3,789
0000045107HBC92	74	79	5	197
Total			111	7,614

This is similar to the findings from the last audit but as HDC has only recently switched into Manawa I was unable to determine if the differences still relate to Waka Kotahi lights being recorded against the incorrect ICP or not. This has been passed to Manawa to investigate with HDC and I have repeated the recommendation from the last audit to maintain visibility. This could be resulting in incorrect submissions and is recorded as non-compliance below.

Recommendation	Description	Audited party comment	Remedial action
Deriving submission information	Review database extract provided with the equivalent monthly report to identify why there are discrepancies.	<p>A comparison has been conducted by BECA who manages the database on behalf of the HDC, it was identified that the extracted information for the audit contained state highway lights that are removed from the data set each month, this explains why the dataset Manawa provided Veritek had different Lamp and wattage counts to that provided by HDC.</p> <p>Manawa will reach out to its contact at NZTA to confirm that the lamps that are being filtered out of the data each month, are actually included in another database with NZTA, once confirmation is provided HDC will be able to instruct BECA to remove them altogether</p>	Investigating

As noted in the last two audits, Hastings DC has implemented a CMS system. This will interface with RAMM. 60% of the lights on and off times are controlled by the CMS. The on and off times are pre-programmed based on sunset and sunrise times. This is likely to vary slightly from the Unison controlled ripple relays. HDC were unclear if there is any static dimming in use and I recommend that this is investigated to confirm.

Recommendation	Description	Audited party comment	Remedial action
Deriving submission information	Check CMS to confirm if any lights are statically dimmed and adjust light wattages in RAMM accordingly.	As this is a new customer relationship Manawa will work with HDC to understand their progress with their CMS and dimmable lighting. A meeting has been organised for post audit to carry on these discussions, working with their DB maintenance Contractor BECA	Investigating

HDC do intend to use dimming in the future and are still working on the data issues that need to be resolved before the CMS system can be used to derive streetlight volumes. Once this is resolved, Manawa will work with HDC to progress a profile before dimming is deployed. The inaccurate on and off times are recorded as non-compliance.

As detailed in **section 3.1**, in absolute terms, total annual consumption is estimated to be 19,700 kWh higher than the DUMML database indicates. This is outside the allowable +/- 5% variance threshold and is recorded as non-compliance below.

Analysis of the database found ten items of load with the incorrect ballast applied resulting in a very minor estimated over submission of 174.3 kWh per annum.

Submission calculations take into account changes made at a daily level.

## Audit outcome

Non-compliant

Non-compliance	Description		
<p>Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3</p> <p>From: 03-Jul-23 To: 08-Apr-24</p>	<p>Very minor over submission of 2.99kWh for ICP 0000045104HB052 for the month of March 2024.</p> <p>Potential under submission of 7,614 kWh for the month of March 2024.</p> <p>Database assessed as having poor precision therefore the potential error is greater than 5.0% resulting in an estimated under submission of 19,700 kWh per annum.</p> <p>Ten items of load with the incorrect ballast applied resulting in a very minor estimated over submission of 174.3 kWh per annum.</p> <p>Inaccurate on and off times as the logger times will vary slightly from the CMS on and off times.</p> <p>Potential impact: Medium</p> <p>Actual impact: Medium</p> <p>Audit history: Multiple times</p> <p>Controls: Moderate</p> <p>Breach risk rating: 4</p>		
Audit risk rating	Rationale for audit risk rating		
<p><b>Medium</b></p>	<p>The controls are rated as moderate overall but there is room for improvement.</p> <p>The impact is assessed to be medium, based on the kWh differences described above.</p>		
Actions taken to resolve the issue		Completion date	Remedial action status
<p>As above, a comparison has been conducted by BECA who manages the database on behalf of the HDC, it was identified that the extracted information for the audit contained state highway lights that are removed from the data set each month, this explains why the dataset Manawa provided Veritek had different Lamp and wattage counts to that provided by HDC.</p>		<p>31/05/2024</p>	<p>Investigating</p>
Preventative actions taken to ensure no further issues will occur		Completion date	
<p>Manawa will reach out to its contact at NZTA to confirm that the lamps that are being filtered out of the data each month, are actually included in another database with NZTA, once confirmation is provided HDC will be able to instruct BECA to remove them altogether.</p> <p>A meeting has been organised for post audit to discuss HDCs CMS and plans for dimming; this will be done in conjunction with their DB maintenance contractor BECA. This should help us to improve the accuracy of submission by understanding more accurate on/off times.</p>		<p>01/10/2024</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 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 in RAMM have an ICP number recorded. The accuracy of the ICP applied is discussed in **section 3.1**.

### 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 fields for the street address and also GPS coordinates. There are four records that do not have GPS coordinates. All have a displacement value recorded so they are locatable.

### Audit outcome

Compliant

## 2.4. Description and capacity of load (Clause 11(2)(c) and (d) of Schedule 15.3)

### Code reference

*Clause 11(2)(c) and (d) of Schedule 15.3*

### Code related audit information

*The DUML database must contain:*

- *a description of load type for each item of load and any assumptions regarding the capacity,*
- *the capacity of each item in watts.*

### Audit observation

The database was checked to confirm that it contained a field for lamp type, wattage capacity, and included any ballast or gear wattage. Wattages were checked for alignment with the published standardised wattage table produced by the Electricity Authority.

### Audit commentary

Fields exist in RAMM for lamp make and model. I analysed the database and found all items of load had lamp description and wattages recorded.

The accuracy of the light wattage and ballasts is discussed further 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 381 lights using the statistical sampling methodology.

### Audit commentary

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

Discrepancy	Quantity
Incorrect wattage	5
Missing in the field	0
In the field not in the database	6

The field audit found six additional lights. This is recorded as non-compliance below.

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

### Audit outcome

Non-compliant

Non-compliance	Description	
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3 From: 03-Jul-23 To: 08-Apr-24	Six additional lights identified in the field audit. Potential impact: Low Actual impact: Low Audit history: Four times previously Controls: Moderate Breach risk rating: 2	
Audit risk rating	Rationale for audit risk rating	
<b>Low</b>	The controls are rated as moderate as the processes in place to update the database are generally robust. The impact is assessed to be low based on the small number of additional lights found in relation to the sample checked.	
Actions taken to resolve the issue	Completion date	Remedial action status
Manawa is working with HDC to confirm that the confirmation process conducted by their contractor Pope electrical, when updating the DB, is being followed correctly, particularly around the addition of new lamps.	01/08/2024	Investigating
Preventative actions taken to ensure no further issues will occur	Completion date	
As well as confirming the process is being followed by the contractor, Manawa will work with HDC to assess whether this process is still fit for purpose.	[proposed or actual date]	

## 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 ability of the database to track changes was assessed and the process for tracking of changes in the database was examined.

### Audit commentary

The 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

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	Hastings District Council streetlights
Strata	The database contains items of load in the Hastings 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 five strata, as follows: <ul style="list-style-type: none"> <li>roads A-Fre,</li> <li>roads Fri-Ke,</li> <li>roads Ki-Ol,</li> <li>roads Om-Sp, and</li> <li>roads St-Y.</li> </ul>
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 60 sub-units.
Total items of load	381 items of load were checked.

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

##### Audit commentary

##### Database accuracy based on the field audit

A field audit was conducted of a statistical sample of 381 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 higher than the database wattage by 1.1%
R <sub>L</sub>	98.0	With a 95% level of confidence, it can be concluded that the error could be between -2% and +5.7%
R <sub>H</sub>	105.7	

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

The conclusion from Scenario C is that the variability of the sample results across the strata means that the true wattage (installed in the field) could be between 2% lower and 5.7% higher than the wattage recorded in the DUMML database. Non-compliance is recorded because the potential error is greater than 5.0%.

In absolute terms the installed capacity is estimated to be 5 kW higher than the database indicates.

There is a 95% level of confidence that the installed capacity is between 9 kW lower and 26 kW higher than the database.

In absolute terms, total annual consumption is estimated to be 19,700 kWh higher than the DUMML database indicates.

There is a 95% level of confidence that the annual consumption is between 39,100 kWh lower to 111,900 kWh p.a. higher than the database indicates.

Scenario	Description
<b>A - Good accuracy, good precision</b>	This scenario applies if: (a) $R_H$ is less than 1.05; and (b) $R_L$ is greater than 0.95  The conclusion from this scenario is that: (a) the best available estimate indicates that the database is accurate within +/- 5 %; and (b) this is the best outcome.
<b>B - Poor accuracy, demonstrated with statistical significance</b>	This scenario applies if: (a) the point estimate of R is less than 0.95 or greater than 1.05 (b) as a result, either $R_L$ is less than 0.95 or $R_H$ is greater than 1.05.  There is evidence to support this finding. In statistical terms, the inaccuracy is statistically significant at the 95% level
<b>C - Poor precision</b>	This scenario applies if: (a) the point estimate of R is between 0.95 and 1.05 (b) $R_L$ is less than 0.95 and/or $R_H$ is greater than 1.05  The conclusion from this scenario is that the best available estimate is not precise enough to conclude that the database is accurate within +/- 5 %

#### Lamp description and capacity accuracy

The database was analysed and found, as reported in the last audit:

- 2,099 items of load where the light description details were insufficient to confirm the correct wattage had been applied - I have repeated the last audit's recommendation that the light descriptions are reviewed to ensure that the wattage can be confirmed as correct, and
- a small handful of incorrect ballasts applied:

Light type	Database ballast	Expected ballast	Quantity	Total difference	Annualised kWh impact
23W Fluro Compact	0	2.6W	2	5.2	+22.2
23W Fluro Compact	9	2.6	8	-48.8	-196.5
Overall impact					-174.3

The impact on reconciliation is very minor and is recorded as non-compliance below and in **sections 2.1** and **3.2**.

Recommendation	Description	Audited party comment	Remedial action
<b>Database accuracy</b>	Review LED light descriptions to ensure that the wattage can be confirmed as correctly applied.	Manawa to work with HDC to make sure that the LED light descriptions are updated in the DB, so that wattages can be easily identified	Investigating

#### ICP allocation

All ICPs had an ICP allocated but as detailed in **section 2.1**, there are variances between the number of items of load recorded in the database and that being provided in the monthly report. I have recommended in **section 2.1**, that this be investigated.

#### Change Management

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

#### Streetlights

All fault and maintenance work is conducted by Pope Electrical through “RAMM Contractor” and once each job is completed the database is updated via field PDAs. There is an invoice checking process conducted by HDC which helps to ensure database accuracy. Lamp outages are predominately notified to HDC by residents from which work requests are made to Pope Electrical.

Hastings DC has implemented a CMS system. This includes fault reporting so that future lighting faults will be reported by the CMS system.

When lighting in new subdivisions is connected, “as built” plans are supplied to HDC, these are then sent to Beca to load them to RAMM. It was unclear if Pope Electrical are still being sent to check the lights in the field prior to populating the database. The field audit identified five lights in a new street that were missing from the database. I recommend that this process is reviewed to ensure all new lights are recorded correctly.

Recommendation	Description	Audited party comment	Remedial action
<b>Database accuracy</b>	Review new streetlight connection process to ensure that these are captured correctly.	As well as confirming the process is being followed by the contractor, Manawa will work with HDC to assess whether this process is still fit for purpose, so that any changes are being captured accurately and quickly.	Investigating

Parks and Amenity lighting

The last audit recorded that the updating of these changes into RAMM is not well mapped. As the retailer has changed during the audit period, I have repeated the last audit's recommendation that this process is reviewed as it is unclear if this has been adopted.

Recommendation	Description	Audited party comment	Remedial action
Database accuracy	Review change management process for Parks and Amenity lighting to ensure changes made in the field are updated in the database.	Manawa to work with HDC on this in our post audit follow up meeting	Investigating

**Audit outcome**

Non-compliant



Non-compliance	Description		
Audit Ref: 3.1 With: Calsie 15.2 and 15.37B(b)  From: 03-Jul-23 To: 08-Apr-24	Database assessed to have poor precision therefore the potential error is greater than 5% resulting in an estimated under submission of 19,700 kWh per annum.  Ten items of load with the incorrect ballast applied resulting in a very minor estimated over submission of 174.3 kWh per annum.  Potential impact: Medium  Actual impact: Medium  Audit history: Multiple times  Controls: Moderate  Breach risk rating: 4		
Audit risk rating	Rationale for audit risk rating		
<b>Medium</b>	The controls are rated as moderate overall but there is room for improvement.  The impact is assessed to be medium, based on the kWh differences described above.		
Actions taken to resolve the issue		Completion date	Remedial action status
As above, a comparison has been conducted by BECA who manages the database on behalf of the HDC, it was identified that the extracted information for the audit contained state highway lights that are removed from the data set each month, this explains why the dataset Manawa provided Veritek had different Lamp and wattage counts to that provided by HDC.		31/05/2024	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	
Manawa will reach out to its contact at NZTA to confirm that the lamps that are being filtered out of the data each month, are actually included in another database with NZTA, once confirmation is provided HDC will be able to instruct BECA to remove them altogether.  Manawa will also work with HDC to get them to update their incorrect ballast information identified in this audit		01/10/2024	

### 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

Manawa reconciles this DUML load using the STL profile. 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 a data logger.

I checked the submission calculation provided by Manawa for March 2024 and found the calculation was correct for all but one of the ICPs from the information provided by HDC. The calculation for ICP 0000045104HB052 was 2.99kWh’s lower than the calculated volume submitted by Manawa. This has been passed to Manawa to investigate and is recorded as non-compliance below.

I checked the volumes against the database extract provided and found light count and volume difference between the monthly report provided to Manawa for four of the six ICPs:

ICP	Manawa light fittings	HDC database extract light fittings	Net light count difference	Calculated kWh volume difference for March 2024
0000939902HBFF4	2,721	2,848	127	2,792
0000939904HBE7B	89	111	22	835
0000045104HB052	4,535	4,619	84	3,789
0000045107HBC92	74	79	5	197
Total			111	7,614

This is similar to the findings from the last audit but as HDC has only recently switched into Manawa I was unable to determine if the differences still relate to Waka Kotahi lights being recorded against the incorrect ICP or not. This has been passed to Manawa to investigate with HDC and I have repeated the recommendation in **section 2.1**, from the last audit to do this. This could be resulting in incorrect submissions and is recorded as non-compliance below.

As noted in the last two audits, Hastings DC has implemented a CMS system. This will interface with RAMM. 60% of the lights on and off times are controlled by the CMS. The on and off times are pre-programmed based on sunset and sunrise times. This is likely to vary slightly from the Unison controlled ripple relays. HDC were unclear if there is any static dimming in use and I recommend in **section 2.1**, that this is investigated to confirm.

HDC do intend to use dimming in the future and are still working on the data issues that need to be resolved before the CMS system can be used to derive streetlight volumes. Once this is resolved, Manawa will work with HDC to progress a profile before dimming is deployed. The inaccurate on and off times are recorded as non-compliance.

As detailed in **section 3.1**, in absolute terms, total annual consumption is estimated to be 19,700 kWh higher than the DUML database indicates. This is outside the allowable +/- 5% variance threshold and is recorded as non-compliance below.

Analysis of the database found ten items of load with the incorrect ballast applied resulting in a very minor estimated over submission of 174.3 kWh per annum.

Submission calculations take into account changes made at a daily level.

**Audit outcome**

Non-compliant

Non-compliance	Description		
<p>Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c)</p> <p>From: 03-Jul-23 To: 08-Apr-24</p>	<p>Very minor over submission of 2.99kWh for ICP 0000045104HB052 for the month of March 2024.</p> <p>Potential under submission of 7,614 kWh for the month of March 2024.</p> <p>Database assessed as having poor precision therefore the potential error is greater than 5.0% resulting in an estimated under submission of 19,700 kWh per annum.</p> <p>Ten items of load with the incorrect ballast applied resulting in a very minor estimated over submission of 174.3 kWh per annum.</p> <p>Inaccurate on and off times as the logger times will vary slightly from the CMS on and off times.</p> <p>Potential impact: Medium</p> <p>Actual impact: Medium</p> <p>Audit history: Multiple times</p> <p>Controls: Moderate</p> <p>Breach risk rating: 4</p>		
Audit risk rating	Rationale for audit risk rating		
<p><b>Medium</b></p>	<p>The controls are rated as moderate overall but there is room for improvement.</p> <p>The impact is assessed to be medium, based on the kWh differences described above.</p>		
Actions taken to resolve the issue		Completion date	Remedial action status
<p>As above, a comparison has been conducted by BECA who manages the database on behalf of the HDC, it was identified that the extracted information for the audit contained state highway lights that are removed from the data set each month, this explains why the dataset Manawa provided Veritek had different Lamp and wattage counts to that provided by HDC.</p>		<p>31/05/2024</p>	<p>Investigating</p>
Preventative actions taken to ensure no further issues will occur		Completion date	
<p>Manawa will reach out to its contact at NZTA to confirm that the lamps that are being filtered out of the data each month, are actually included in another database with NZTA, once confirmation is provided HDC will be able to instruct BECA to remove them altogether.</p> <p>A meeting has been organised for post audit to discuss HDCs CMS and plans for dimming; this will be done in conjunction with their DB maintenance contractor BECA. This should help us to improve the accuracy of submission by understanding more accurate on/off times.</p>		<p>01/10/2024</p>	

## CONCLUSION

Hastings DC switched to Manawa Energy on 1 March 2024.

The database is remotely hosted by thinkproject New Zealand Ltd. For streetlights, the database population, field work and asset data capture are conducted by Pope Electrical. Database management is undertaken by Beca. Parks and Amenity lights are also recorded in the database. Changes made in the field are expected to be advised to the Transport team. I have repeated the recommendation from the last audit that this process is reviewed to ensure that changes are captured as expected.

As noted in the last two audits, Hastings DC has implemented a CMS system. This will interface with RAMM. 60% of the lights on and off times are controlled by the CMS. The on and off times are pre-programmed based on sunset and sunrise times. This is likely to vary slightly from the Unison controlled ripple relays. HDC were unclear if there is any static dimming in use and I recommend that this is investigated to confirm.

HDC do intend to use dimming in the future and are still working on the data issues that need to be resolved before the CMS system can be used to derive streetlight volumes. Once this is resolved, Manawa will work with HDC to progress a profile before dimming is deployed. The inaccurate on and off times are recorded as non-compliance.

As was found in the last audit, there are differences in the light volumes recorded and therefore the submission values between the database extract and the monthly wattage report being provided to Manawa. As HDC has only recently switched into Manawa, I was unable to determine if the differences relate to Waka Kotahi lights being recorded against the incorrect ICP or not. This has been passed to Manawa to investigate with HDC and I have repeated the recommendation from the last audit to maintain visibility. This could be resulting in incorrect submissions.

The database accuracy analysis fell just outside of the allowable +/-5% threshold. This appears to have improved from the last audit, but I note that the random selection did not include many Parks and Amenity lights when compared to the last sample. These lights were found to have a high level of error in the last audit. Database accuracy is described as follows:

Result	Percentage	Comments
The point estimate of R	101.1	Wattage from survey is higher than the database wattage by 1.1%
R <sub>L</sub>	98.0	With a 95% level of confidence, it can be concluded that the error could be between -2% and +5.7%
R <sub>H</sub>	105.7	

In absolute terms, total annual consumption is estimated to be 19,700 kWh higher than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 39,100 kWh lower to 111,900 kWh p.a. higher than the database indicates.

The audit found four non-compliances and five recommendations are made. The future risk rating of 14 indicates that the next audit be completed in 12 months. I have considered Manawa's comments and as:

- the submission value differences between the database extract and the monthly wattage report being provided still exist,
- being unable to confirm if process improvements recommended in the last audit have been adopted, and
- the database changing traders just prior to this audit being due,
- I recommend that the next audit be in no more than 12 months time.

## PARTICIPANT RESPONSE

Manawa has taken follow up action with HDC and its contractor BECA to identify the lamp volume and wattage discrepancies. BECA has provided a comparison of their own DB and have confirmed that incorrect data was provided to Veritek by HDC that contained State highway lamps that had previously been recorded in RAMM as they were in the same location but are actually owned by NZTA, these lamps were, correctly, not being included in the data provided to Manawa which explains the differences between the data Manawa provided Veritek and the data provided by HDC.

As Manawa has a working relationship with the NZTA we will confirm that the state highway lamps are being reconciled in another DB managed by NZTA before instructing HDC to remove these via their contractor. As HDC is a new customer relationship Manawa has organised for a post audit meeting to be held so that the process issues, CMS, and dimmable streetlighting can be discussed in greater detail.

We have had a good level of engagement from HDC around the issues identified by the audit already and we are confident that the process issues can be corrected relatively easily. We support an 18 month audit time frame for this DUML DB.