

ELECTRICITY INDUSTRY PARTICIPATION CODE  
DISTRIBUTED UNMETERED LOAD AUDIT REPORT



For

UPPER HUTT CITY COUNCIL  
AND  
GENESIS ENERGY LIMITED  
NZBN: 9429037706609

Prepared by: Tara Gannon

Date audit commenced: 13 August 2024

Date audit report completed: 18 September 2024

Audit report due date: 1 October 2024

---

## TABLE OF CONTENTS

Executive summary .....	3
Audit summary .....	4
Non-compliances .....	4
Recommendations .....	5
Issues .....	5
1. Administrative.....	6
1.1. Exemptions from Obligations to Comply with Code .....	6
1.2. Structure of Organisation.....	6
1.3. Persons involved in this audit.....	7
1.4. Hardware and Software .....	7
1.5. Breaches or Breach Allegations.....	7
1.6. ICP Data .....	8
1.7. Authorisation Received .....	8
1.8. Scope of Audit .....	8
1.9. Summary of previous audit .....	9
1.10. Distributed unmetered load audits (Clause 16A.26 and 17.295F).....	11
2. DUML database requirements.....	12
2.1. Deriving submission information (Clause 11(1) of schedule 15.3).....	12
2.2. ICP identifier and items of load (Clause 11(2)(a) and (aa) of schedule 15.3).....	13
2.3. Location of each item of load (Clause 11(2)(b) of schedule 15.3).....	14
2.4. Description and capacity of load (Clause 11(2)(c) and (d) of schedule 15.3).....	14
2.5. All load recorded in database (Clause 11(2A) of schedule 15.3).....	15
2.6. Tracking of load changes (Clause 11(3) of schedule 15.3) .....	19
2.7. Audit trail (Clause 11(4) of schedule 15.3).....	19
3. Accuracy of DUML database .....	21
3.1. Database accuracy (Clause 15.2 and 15.37B(b)) .....	21
3.2. Volume information accuracy (Clause 15.2 and 15.37B(c)) .....	26
Conclusion .....	28
Participant response .....	28

## EXECUTIVE SUMMARY

This audit of the **Upper Hutt City Council (UHCC)** DUML database and processes was conducted at the request of **Genesis Energy (Genesis)** 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 scope of the audit encompasses the collection, security, and accuracy of the data, including the preparation of submission information.

Streetlight information is recorded in a RAMM database managed by UHCC. New connection, fault and maintenance work is completed by Fulton Hogan, who update the database. During the audit period UHCC has resolved some database accuracy issues identified during the previous audit including missing and invalid zero wattages.

A snapshot extract from this database is provided to Genesis monthly and used to determine the wattage for their submission calculations. Genesis settles the DUML load as NHH using the GSL profile, and on hours are determined from data logger information.

A field audit was undertaken of a statistical sample of 385 items of load on 20 to 22 August 2024. The field audit found that the best available estimate is not precise enough to conclude that the database is accurate within  $\pm 5.0\%$ . In absolute terms, total annual consumption is estimated to be 15,600 kWh higher than the DUML database indicates.

The audit found four non-compliances and made two recommendations. The future risk rating of 14 indicates that the next audit be completed in 12 months and I agree with this recommendation. Accuracy improvement has occurred during the audit period and further improvement is expected.

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>The best available estimate is not precise enough to conclude that the database is accurate within <math>\pm 5.0\%</math> which could result in under submission of 15,600 kWh p.a.</p> <p>Five lamp models had some lamps with a wattage inconsistent with their description, and have been checked and had their wattages and/or descriptions updated during the audit. The lights with confirmed incorrect wattages resulted in potential over submission of 401.5 kWh per annum until they were corrected.</p> <p>The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.</p>	Moderate	Medium	4	Investigating
All load recorded in database	2.5	11(2A) of schedule 15.3	<p>Two additional lights found in the field.</p> <p>Nine new subdivision lights are not recorded in the database.</p>	Moderate	Low	2	Investigating
Database accuracy	3.1	15.2 and 15.37B(b)	<p>The best available estimate is not precise enough to conclude that the database is accurate within <math>\pm 5.0\%</math> which could result in under submission of 15,600 kWh p.a.</p> <p>Five lamp models had some lamps with a wattage inconsistent with their description, and have been checked and had their wattages and/or descriptions updated during the audit. The lights with confirmed incorrect wattages resulted in potential over submission of 401.5 kWh per annum until they were corrected.</p> <p>13 lights had incorrect road names but correct GPS coordinates.</p>	Moderate	Medium	4	Investigating
Volume information accuracy	3.2	15.2 and 15.37B(c)	<p>The best available estimate is not precise enough to conclude that the database is accurate within <math>\pm 5.0\%</math> which could result in under submission of 15,600 kWh p.a.</p>	Moderate	Medium	4	Investigating

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
			<p>Five lamp models had some lamps with a wattage inconsistent with their description, and have been checked and had their wattages and/or descriptions updated during the audit. The lights with confirmed incorrect wattages resulted in potential over submission of 401.5 kWh per annum until they were corrected.</p> <p>The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.</p>				
Future Risk Rating						14	

<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

Section	Subject	Description	Participant comment
2.5	Responsibility for private lights	<p>Advise developers that where private lights are to be connected, developers are required to arrange the connection with their own retailer and Wellington Electricity to ensure that an ICP number is created.</p> <p>Remind the developer responsible for Wallaceville Estate that they are required to arrange for ICPs to be created for private lights.</p>	To be arranged.

## 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

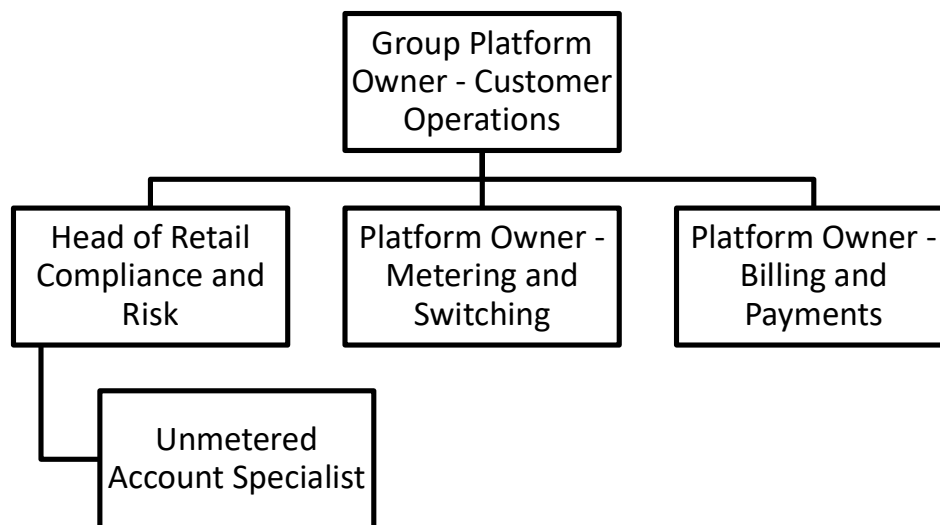
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

#### Audit commentary

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

### 1.2. Structure of Organisation

Genesis provided a copy of their organisational structure.



### 1.3. Persons involved in this audit

Auditor:

Name	Title	Company
Tara Gannon	Auditor	Provera

Other personnel assisting in this audit were:

Name	Title	Company
Nir Kumar	Senior Roding Engineer - Operations	Upper Hutt City Council
Charles Kingsford	Principal Traffic Engineer Team Leader Operations	Upper Hutt City Council
Patrick Hanaray	Roding Manager	Upper Hutt City Council
Alysha Majury	Unmetered Account Specialist	Genesis Energy
Johan van Staden	Risk & Compliance Specialist	Genesis Energy

### 1.4. Hardware and Software

#### **RAMM**

The SQL database used for the management of DUML is remotely hosted by thinkproject New Zealand Limited. The database is commonly known as “RAMM” which stands for “Road Assessment and Maintenance Management”. The specific data used for DUML is held in the Streetlight tables. thinkproject New Zealand Limited backs up the database and assists with disaster recovery as part of their hosting service.

#### **Genesis Energy Systems**

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)
0001255307UNA1A	MASTER ICP UHCC UHT0331	UHT0331	GSL	2,441	155,628
0001256870UN363	MASTER ICP UHCC STREETLIGHT HAY0111	HAY0111	GSL	386	13,618
0001256872UN3E6	MASTER STREETLIGHT ICP UHCC HAY0331	HAY0331	GSL	1,500	79,995
<b>Total</b>				<b>4,327</b>	<b>249,241</b>

## 1.7. Authorisation Received

All information was provided directly by Genesis and UHCC.

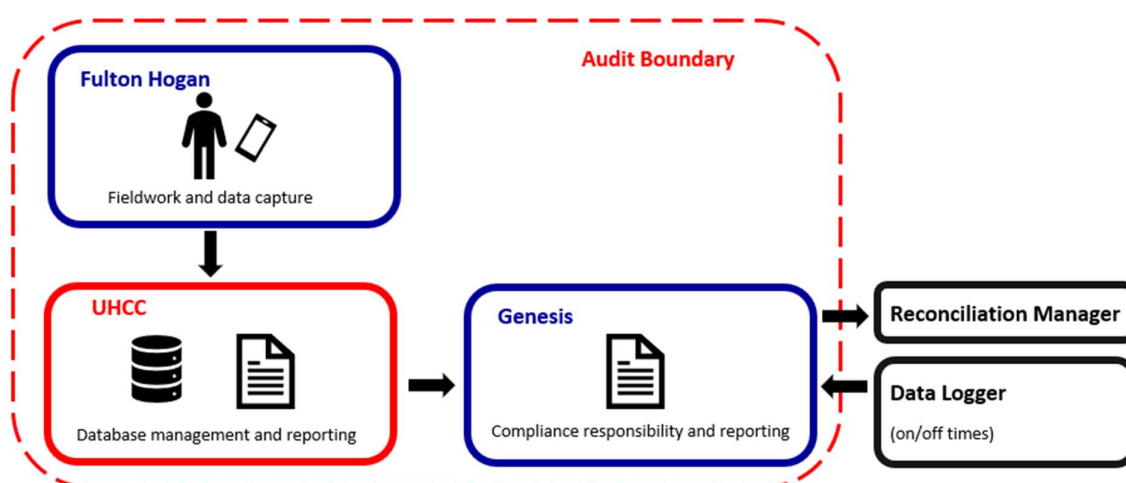
## 1.8. Scope of Audit

This audit of the UHCC DUML database and processes was conducted at the request of Genesis 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.

Streetlight information is recorded in a RAMM database managed by UHCC. New connection, fault and maintenance work is completed by Fulton Hogan, who update the database using Pocket RAMM.

A snapshot extract from this database is provided to Genesis monthly, and used to determine the wattage for their submission calculations. Genesis settles the DUML load as NHH using the GSL profile, and on hours are determined from data logger information.

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 a statistical sample of 385 items of load on 20 to 22 August 2024.



## 1.9. Summary of previous audit

The previous audit was completed in August 2023 by Tara Gannon of Provera. Five non-compliances and three recommendations were identified. The statuses of the non-compliances, recommendations, and issue are described below.

Subject	Section	Clause	Non-compliance	Status
Deriving submission information	2.1	11(1) of schedule 15.3	<ol style="list-style-type: none"> <li>1. The best available estimate is not precise enough to conclude that the database is accurate within <math>\pm 5.0\%</math> which could result in under submission of 11,000 kWh p.a.</li> <li>2. The April 2023 submission was estimated based on the March 2023 database extract because the April 2023 extract excluded gear wattages.</li> <li>3. Three items of load (luminaire_ids 12850, 12851 and 12852) with blank ICP numbers were confirmed not to be present in the field but have a gear wattage recorded which could result in over submission of 179.4 kWh p.a.</li> <li>4. 84 of the 4,242 items of load did not have a valid zero (for LED) or non-zero gear wattage. The incorrect data resulted in potential over submission of 666.3 kWh p.a. and all errors resulting in a wattage difference have been corrected.</li> <li>5. 20 lamps with inconsistent model and wattage information were checked and updated during the audit, and the incorrect data resulted in potential under submission of 4,313.7 kWh p.a.</li> <li>6. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.</li> </ol>	<ol style="list-style-type: none"> <li>1. Still existing.</li> <li>2. Still existing and r14 has been completed.</li> <li>3. Cleared.</li> <li>4. Cleared.</li> <li>5. Some discrepancies still exist.</li> <li>6. Still existing.</li> </ol>
Description and capacity of load	2.4	Clause 11(2)(c) and (d) of schedule 15.3	81 of the 4,242 items of load with a DUML ICP number had a blank or invalid zero gear wattage. 78 are recorded as LED lamps and expected to have a zero year wattage, and UHCC intends to correct the gear wattages to zero. The other three lights were checked, and their lamp models, lamp wattages and gear wattages were corrected during the audit.	Cleared.
All load recorded in database	2.5	11(2A) of schedule 15.3	Four additional lights found in the field.	Still existing.

Subject	Section	Clause	Non-compliance	Status
Database accuracy	3.1	15.2 and 15.37B(b)	<ol style="list-style-type: none"> <li>1. The best available estimate is not precise enough to conclude that the database is accurate within <math>\pm 5.0\%</math> which could result in under submission of 11,000 kWh p.a.</li> <li>2. Three items of load (luminaire_ids 12850, 12851 and 12852) with blank ICP numbers were confirmed not to be present in the field but have a gear wattage recorded which could result in over submission of 179.4 kWh p.a.</li> <li>3. 84 of the 4,242 items of load did not have a valid zero (for LED) or non-zero gear wattage. The incorrect data resulted in potential over submission of 666.3 kWh p.a. and all errors resulting in a wattage difference have been corrected.</li> <li>4. 20 lamps with inconsistent model and wattage information were checked and updated during the audit, and the incorrect data resulted in potential under submission of 1,010 W or 4,313.7 kWh p.a.</li> </ol>	<ol style="list-style-type: none"> <li>1. Still existing.</li> <li>2. Cleared.</li> <li>3. Cleared.</li> <li>4. Some discrepancies still exist.</li> </ol>
Volume information accuracy	3.2	15.2 and 15.37B(c)	<ol style="list-style-type: none"> <li>1. The best available estimate is not precise enough to conclude that the database is accurate within <math>\pm 5.0\%</math> which could result in under submission of 11,000 kWh p.a.</li> <li>2. The April 2023 submission was estimated based on the March 2023 database extract because the April 2023 extract excluded gear wattages.</li> <li>3. Three items of load (luminaire_ids 12850, 12851 and 12852) with blank ICP numbers were confirmed not to be present in the field but have a gear wattage recorded which could result in over submission of 179.4 kWh p.a.</li> <li>4. 84 of the 4,242 items of load did not have a valid zero (for LED) or non-zero gear wattage. The incorrect data resulted in potential over submission of 666.3 kWh p.a. and all errors resulting in a wattage difference have been corrected.</li> <li>5. 20 lamps with inconsistent model and wattage information were checked and updated during the audit, and the incorrect data resulted in potential under submission of 4,313.7 kWh p.a.</li> <li>6. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.</li> </ol>	<ol style="list-style-type: none"> <li>1. Still existing.</li> <li>2. Still existing and r14 has been completed.</li> <li>3. Cleared.</li> <li>4. Cleared.</li> <li>5. Some discrepancies still exist.</li> <li>6. Still existing.</li> </ol>

Subject	Section	Recommendation	Status
Responsibility for private lights	2.2	Advise developers that where private lights are to be connected, developers are required to arrange the connection with their own retailer and Wellington Electricity to ensure that an ICP number is created.  Remind the developer responsible for Wallaceville Estate that they are required to arrange for ICPs to be created for private lights.	The recommendation is repeated.
Check and update lamp information	3.1	Populate zero lamp wattages for the 78 LED lights which have a blank gear wattage recorded.  Check and update the lamp information for the remaining 14 lights are listed as 22WLED - CREE - XSP1-IP66 with 27W.  Check and update the lamp information for luminaire ID 9101 on Kiln St.	These recommendations have been investigated and the database has been updated.
Confirm the ownership and operation of carpark lights to ensure this load is accounted for	3.1	Confirm the ownership and operation of the carpark lights at Trentham Memorial Park and Maidstone Park to ensure this load is accounted for.	All lights connected to unmetered streetlight circuits are now recorded in RAMM and the remaining lights are connected to metered ICPs.

## 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

Genesis have requested Provera to undertake this streetlight audit.

### Audit commentary

This audit report confirms that the requirement to conduct an audit has been met for this database within the required timeframe.

### Audit outcome

Compliant

## 2. DUML DATABASE REQUIREMENTS

### 2.1. Deriving submission information (Clause 11(1) of schedule 15.3)

#### Code reference

Clause 11(1) of schedule 15.3

#### Code related audit information

The retailer must ensure the:

- DUML database is up to date,
- methodology for deriving submission information complies with schedule 15.5.

#### Audit observation

The process for calculation of consumption was examined.

#### Audit commentary

##### Submission process and accuracy

Genesis reconciles the DUML load as NHH using the GSL profile.

- Wattages are derived from a snapshot extract from the database provided by UHCC monthly.
- On and off times are derived from data logger information.

UHCC uses a SQL script to produce the monthly extracts for Genesis, because the downloads from RAMM's AMDS do not contain all the required fields. As recorded in previous audits, a monthly snapshot is not sufficient to calculate submission from. The code requires that submissions must account for when each item of load was physically installed or removed, and wash up volumes must account for historical corrections.

I reviewed the submission information for July 2024 and confirmed that it the calculation methodology was correct, with wattages based on database extract totals and on hours based on data logger information.

##### Database accuracy

Examination of the database found:

Issue	Estimated volume information impact (annual kWh)
The best available estimate is not precise enough to conclude that the database is accurate within $\pm 5.0\%$ . UHCC intends to investigate and update the discrepancies found during the field audit.	Under submission of 15,600 kWh p.a.
Five lamp models had some lamps with a wattage inconsistent with their description, and two lamp models had luminaire models inconsistent with the lamp model. UHCC intends to investigate and update these discrepancies.	The lights with confirmed incorrect wattages resulted in potential over submission of 401.5 kWh per annum until they were corrected.

#### Audit outcome

Non-compliant

Non-compliance	Description	
<p>Audit Ref: 2.1</p> <p>With: Clause 11(1) of schedule 15.3</p> <p>From: 05-Aug-24</p> <p>To: 22-Aug-24</p>	<p>The best available estimate is not precise enough to conclude that the database is accurate within <math>\pm 5.0\%</math> which could result in under submission of 15,600 kWh p.a.</p> <p>Five lamp models had some lamps with a wattage inconsistent with their description, and have been checked and had their wattages and/or descriptions updated during the audit. The lights with confirmed incorrect wattages resulted in potential over submission of 401.5 kWh per annum until they were corrected.</p> <p>The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.</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	
<b>Medium</b>	<p>The controls are moderate because the best available estimate is not precise enough to conclude that the database is accurate within <math>\pm 5.0\%</math>.</p> <p>The audit risk rating is medium based on kWh variances. UHCC intends to investigate and resolve all the discrepancies.</p>	
Actions taken to resolve the issue	Completion date	Remedial action status
UHCC is in the process of investigating discrepancies identified during the audit.	15/10/2024	Investigating
Preventative actions taken to ensure no further issues will occur	Completion date	
Fulton Hogan carry out field audits to identify mismatches in the field, during the night and resolve these through updating the database.		

## 2.2. ICP identifier and items of load (Clause 11(2)(a) and (aa) of schedule 15.3)

### Code reference

Clause 11(2)(a) and (aa) of schedule 15.3

### Code related audit information

The DUMML database must contain:

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

### Audit observation

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

### Audit commentary

All items of load recorded in the database have an ICP number recorded.

**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 road name, location number, road side and GPS coordinates. All items of load have GPS coordinates and a road name recorded, and are locatable.

The accuracy of addresses is discussed in **section 3.1**.

**Audit outcome**

Compliant

**2.4. Description and capacity of load (Clause 11(2)(c) and (d) of schedule 15.3)**

**Code reference**

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

**Code related audit information**

*The DUML database must contain:*

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

**Audit observation**

The database was checked to confirm that it contained a field for lamp type and wattage capacity and included any ballast or gear wattage.

**Audit commentary**

The database contains fields for luminaire\_make, luminaire\_model, lamp\_make, lamp\_model, lamp wattage and gear wattage.

All items of load have a lamp make, lamp model, lamp wattage and gear wattage recorded. All items of load with zero gear wattages recorded were indicated to be LED lights, and no items of load had a zero lamp wattage.

The accuracy of recorded wattages is discussed in **section 3.1**.

**Audit outcome**

Compliant

## 2.5. All load recorded in database (Clause 11(2A) of schedule 15.3)

### Code reference

Clause 11(2A) of schedule 15.3

### Code related audit information

The retailer must ensure that each item of DUML for which it is responsible is recorded in this database.

### Audit observation

The field audit was undertaken of a statistical sample of 385 items of load on 20 to 22 August 2024. The sample was selected from three strata, as follows:

- HAY0111 and HAY0331 ICPs,
- UHT0331 ICP road names A – L,
- UHT0331 ICP road names L – Z.

### Audit commentary

The field audit discrepancies are detailed in the table below.

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
ANISEED GROVE	15	15	-	1	One L25 (luminaire ID 10508) is recorded in the database as a 27W LED.
BONNIE GLEN CRESCENT	26	26	-	2	Two L24s (luminaire IDs 6837 and 10075) are recorded in the database as 27W LEDs.
CYNISCA CRESCENT	15	15	-	5	Five lights on Cynisca Cres are recorded as 18W LED with 27W, and should have had a wattage of 18W. The exceptions were checked onsite and corrected during the audit.
ELMSLIE ROAD	13	13	-	1	One L27 (luminaire ID 6896) is recorded in the database as a 24W LED. The exception was checked onsite and corrected during the audit.
GRANVILLE STREET	7	7	-	2	One L27 (luminaire ID 3970) was recorded in the database as a 24W LED, and one L149 (luminaire ID 12044) was recorded in the database as a 73W LED. The exceptions were checked onsite and corrected during the audit.
LANE STREET	21	21	-	2	One L27 (luminaire ID 12824) was recorded in the database as a 24W LED, and one L73 (luminaire ID

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
					11899) was recorded in the database as 103W LED.
MALCOLM GILLIES GROVE	8	8	-	5	Five L24s (luminaire IDs 11268-11271) are recorded in the database as L27s. The exceptions were checked onsite and corrected during the audit.
MAYMORN ROAD	15	15	-	2	Two L27s (luminaire IDs 12324 and 12325) are recorded in the database as 73W LED. The exceptions were checked onsite and corrected during the audit.
MCCARTHY GROVE	6	6	-	2	Two L27s (luminaire IDs 541 and 7211) are recorded in the database as 24W LED.
MONTGOMERY CRESCENT	21	21	-	5	Three L73s (luminaire IDs 1037, 1038 and 1039) are labelled as 73W lights with 27W recorded in the database.  Two L73s (luminaire IDs 11487 and 11485) are recorded as 27W LEDs in the database.  The exceptions were checked onsite and corrected during the audit.
NGATA GROVE	10	10	-	1	One L27 (luminaire ID 8475) is recorded in the database as 25W LED. The exception was checked onsite and corrected during the audit.
SPEARGRASS GROVE (35-55)(42-58)	8	10	+2	-	Two L27s opposite 36 and 40 Speargrass Grove are not recorded in the database.
SUNBRAE DRIVE	14	14	-	1	One L27 (luminaire 6709) was recorded in the database as a 24W LED. The exception was checked onsite and corrected during the audit.
TACOMA DRIVE	7	7	-	1	One L23 (luminaire ID 10866) is recorded in the database as a 27W LED.
WEKA GROVE	7	7	-	2	One L27 (luminaire ID 1056) was recorded as 24W LED in the



Address	Database Count	Field Count	Count differences	Wattage differences	Comments
					database and was checked and corrected during the audit.  One L23 (luminaire ID 8141) was recorded as a 27W LED in the database.
WYNDHAM ROAD	26	26	-	2	One L24 (luminaire ID 5976) is recorded as a 27W LED , and one L27 (luminaire ID 20219) is recorded as a 24W LED.
<b>Total</b>	<b>385</b>	<b>387</b>	<b>+2</b>	<b>34</b>	

This clause relates to lights in the field not recorded in the database. Two additional items of load were found in the field, which are recorded as non-compliance below. UHCC intends to investigate and update these discrepancies.

Overall accuracy of the database is detailed in **section 3.1**, along with some road name inaccuracies identified during the field audit.

#### Private lights

Where new private lights are connected, developers are required to arrange the connection with their own retailer and Wellington Electricity to ensure that an ICP number is created. The previous two audits found that some private lights associated with private roads in the Wallaceville Estate had been connected as part of the overall subdivision lighting connection without separate ICPs being created for the private lights, or the lights being added to the DUML database.

Wellington Electricity's audit confirmed that no new ICPs had been requested for these lights, which were expected to be added to the DUML load effective from 6 September 2023 to ensure they were accounted for. I confirmed that no lights were recorded in the database as these locations:

Road	Total watts	Latitude	Longitude	Comment	Status	Impacted Addresses
BUDDLE ROAD	29	-41.135	175.0559	New development	Private Row	1-26 Dahl Drive
DESERT GOLD LANE	15	-41.1392	175.0525	New development	Private Row	1-5 Desert Gold Lane
LE MAR LANE	15	-41.1395	175.052	New development	Private Row	1-7 La Mer Lane
GLOAMING LANE	15	-41.1398	175.0515	New development	Private Row	1-8 Gloaming Lane
KINDERGARTEN LANE	15	-41.1399	175.0509	New development	Private Row	1-7 Kindergarten Lane
MAWAL HAKONA DRIVE EXT	15	-41.1401	175.0505	New development	Private Row	129,131, 133, 135, 137, 139, 141 and 143 Mawai Hakona Drive

Road	Total watts	Latitude	Longitude	Comment	Status	Impacted Addresses
MAWAL HAKONA DRIVE EXT	15	-41.1401	175.0504	New development	Private Row	129,131, 133, 135, 137, 139, 141 and 143 Mawai Hakona Drive
MAWAL HAKONA DRIVE EXT	15	-41.1401	175.0506	New development	Private Row	129,131, 133, 135, 137, 139, 141 and 143 Mawai Hakona Drive
MAWAL HAKONA DRIVE EXT	15	-41.1402	175.0503	New development	Private Row	129,131, 133, 135, 137, 139, 141 and 143 Mawai Hakona Drive

Private lights will continue to contribute towards network UFE until action is taken by the responsible participants.

Recommendation	Description	Audited party comment	Remedial action
Responsibility for private lights	<p>Advise developers that where private lights are to be connected, developers are required to arrange the connection with their own retailer and Wellington Electricity to ensure that an ICP number is created.</p> <p>Remind the developer responsible for Wallaceville Estate that they are required to arrange for ICPs to be created for private lights.</p>	To be arranged.	Identified

### Audit outcome

Non-compliant

Non-compliance	Description
<p>Audit Ref: 2.5</p> <p>With: Clause 11(2A) of schedule 15.3</p> <p>From: 20-Aug-24</p> <p>To: 22-Aug-24</p>	<p>Two additional lights found in the field.</p> <p>Nine new subdivision lights are not recorded in the database.</p> <p>Potential impact: Low</p> <p>Actual impact: Low</p> <p>Audit history: Three times</p> <p>Controls: Moderate</p> <p>Breach risk rating: 2</p>
Audit risk rating	Rationale for audit risk rating
<b>Low</b>	The controls are rated as moderate as the processes in place will ensure that the data is recorded correctly most of the time.

	The impact is low due to the small number of additional lights found in the field in relation to the overall count of the items of load.	
<b>Actions taken to resolve the issue</b>	<b>Completion date</b>	<b>Remedial action status</b>
UHCC is in the process of investigating discrepancies identified during the audit.	15/10/2024	Investigating
<b>Preventative actions taken to ensure no further issues will occur</b>	<b>Completion date</b>	
Fulton Hogan carry out field audits to identify mismatches in the field, during the night and resolve these through updating the database.		

## 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 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 functionality achieves compliance with the code.

**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 Genesis submissions are based on a monthly extract from the database. A database extract was provided for 5 August 2024, and I assessed the accuracy of this by using the DUML Statistical Sampling Guideline. The table below shows the survey plan.

Plan Item	Comments
Area of interest	UHCC region
Strata	The database contains items of load in Upper Hutt area. The processes for the management of all UHCC items of load are the same, and I decided to create three strata: <ul style="list-style-type: none"> <li>• HAY0111 and HAY0331 ICPs,</li> <li>• UHT0331 ICP road names A – L,</li> <li>• UHT0331 ICP road names L – Z.</li> </ul>
Area units	I created a pivot table of the roads, and I used a random number generator in a spreadsheet to select a total of 55 sub-units.
Total items of load	385 items of load were checked making up 5% of the database total.

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

##### Audit commentary

##### Field audit findings

A field audit was conducted of a statistical sample of 385 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	101.5	Wattage from survey is higher than the database wattage by 1.5%.
R <sub>L</sub>	98.3	With a 95% level of confidence, it can be concluded that the error could be between -1.7% and +5.4%.
R <sub>H</sub>	105.4	

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 applies and the best available estimate is not precise enough to conclude that the database is accurate within ±5.0%.

- In absolute terms the installed capacity is estimated to be 4 kW higher than the database indicates.
- There is a 95% level of confidence that the installed capacity is between 4 kW lower to 13 kW higher than the database.
- In absolute terms, total annual consumption is estimated to be 15,600 kWh higher than the DUMML database indicates.
- There is a 95% level of confidence that the annual consumption is between 18,500 kWh p.a. lower and 57,600 kWh p.a. higher than the database indicates.

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

### Wattage and gear accuracy findings

All items of load have a lamp make, lamp model, lamp wattage and gear wattage recorded. All items of load with zero gear wattages recorded were indicated to be LED lights, and no items of load had a zero lamp wattage.

Wattages were checked against the published standardised wattage table produced by the Electricity Authority, and the manufacturer's specifications where they were not included in the standardised wattage table.

Five lamp models had some lamps with a wattage inconsistent with their description:

Lamp model	Total count	Count with unexpected wattage	Volume difference	Comment
133WLED	47	2 x 103W 5 x 128W	-	The 103W lights have luminaire IDs 13034 and 13064. 13034 has light notes indicating 128W.

Lamp model	Total count	Count with unexpected wattage	Volume difference	Comment
				The 128W lights have luminaire IDs 13030 - 13062 and 13093-13094. UHCC has now confirmed the light wattages should be consistent with the models and has updated RAMM.
18WLED	150	18 x 27W	162W or 691.9 kWh p.a. over submission	The 27W LEDs have luminaire IDs 13056 - 13060 and 13066 -13078. UHCC has now confirmed that they are 18W LEDs and updated RAMM.
22WLED	64	14 x 27W	70W or 299.0 kWh p.a. over submission	The previous audit recommended these were checked and updated. UHCC has now confirmed that they are 22W LEDs and updated RAMM.
27WLED	1,720	2 x 24W	-	The 24W LEDs have luminaire IDs 12978 and 13095. UHCC has now confirmed that they are 24W LEDs and updated RAMM.
73WLED	250	3 x 27W	138W or 589.4 kWh under submission	The 27W LEDs have luminaire IDs 13037-13039. UHCC has now confirmed that they are 73W LEDs and updated RAMM.

Two lamp models had luminaire models inconsistent with the lamp model, which will be checked during site visits and updated:

Lamp model	Luminaire model	Lamp wattage	Gear wattage	Count	Comment
25WLED	XSP1IP66-SINGLE MODULE-52W	25	0	1	Luminaire ID 9101. It is expected that all lights on Kiln St are 52W LEDs.
27WLED	18	27	0	1	The lights have luminaire IDs 9780, 9837 and 12035.

Three lamp models had an unusual lamp wattage for their lamp type. UHCC confirmed that they were all custom bollard lights imported by the developer and the lamp and gear wattages are correct.

Lamp model	Total count	Lamp wattage	Gear wattage	Comment
40WMBF (Mercury vapour lamp)	8	40	11	The lights have luminaire IDs 9218-9221, 9242-9243, 9248 and 9254.
40WMCF (Mercury vapour fluorescent)	30	40	11	The lights have luminaire IDs 9222-9241, 9244-9247, 9244-9253 and 9255.
45WSON (Sodium)	5	45	9	The lights have luminaire IDs 9062-9066.

### Address accuracy

During the field audit I found some instances where the road name recorded was not consistent with the street the lights were located on, but the GPS location was correct:

Road	Comment
DANTE ROAD	Four L27 at the eastern end of Dante Road are recorded against George Daniels Road in the database.
THOMPSON SERVICE LANE	Four lights recorded on the Thompson Service Lane are located at Russell Street. Russell St, location was incorrect but they were correct and present.
CARLOW GROVE	Two lights at 3 and 9 Carlow Grove are recorded against a side road.
MCCARTHY GROVE	One light 15 McCarthy is recorded against St John's Wood Road.
ANISEED GROVE (14-34)	Two lights are recorded under Aneseed Grove.

### Change management process findings

New connection, fault and maintenance work is completed by Fulton Hogan, who update the database using Pocket RAMM.

The new connection process was reviewed:

- a plan is prepared by the developer and approved by UHCC,
- the installation is completed, and the developer or their electrician provides information on the installations including records of inspection and certificates of compliance,
- UHCC uses this information to make an application to Genesis for connection for new unmetered load, including the ICP the load is connected to, and the UHCC asset management team is copied in,
- Genesis applies to Wellington Electricity for new unmetered load to be added, and requests livening, and
- the asset management team updates RAMM based on the information in the application; UHCC is not always advised when the lights are connected, but it is generally expected that the load will be livened within one week of application.

### Outage patrols

Outage patrols occur at least monthly at night for arterial routes. The faults process is relied upon to identify issues with other lights.

### Private lights

Where new private lights are connected, developers are required to arrange the connection with their own retailer and Wellington Electricity to ensure that an ICP number is created.

The previous audit found that some private lights associated with private roads in the Wallaceville Estate had been connected as part of the overall subdivision lighting connection without separate ICPs being created for the private lights, or the lights being added to the DUMML database. I checked ICPs with Wallaceville Estate street addresses on the registry and found there was still no unmetered load recorded against ICP addresses in Kindergarten Lane, Gloaming Lane, Le Mer Lane or Desert Gold Lane, and no lights were recorded in the DUMML database against these addresses. A recommendation is raised in **section 2.5**.



### LED upgrade

Most lights have been upgraded to LED. The remaining upgrades will be completed as funding becomes available, or where lights require replacement through the maintenance process.

UHCC has implemented the Telensa central management system and there are plans to use static dimming in the future, depending on the success of implementation of Telensa dimming for other nearby councils. Lights on most arterial routes have been added to Telensa and residential streets are gradually being added. No lights are currently dimmed.

Genesis will be working with UHCC to ensure that there is an appropriate profile used.

### Festive lights

UHCC provides the dates the festive lights are connected to Genesis, and includes the lights in the extract when they are connected. I confirmed that festive lights were excluded from the extracts when they are not connected.

### Parks Lighting

I rechecked Trentham Memorial Park and Maidstone Park where some lights appeared to be missing from the database during the previous audit. All lights connected to unmetered streetlight circuits are now recorded in RAMM and the remaining lights are connected to metered ICPs.

### Audit outcome

Non-compliant

Non-compliance	Description	
<p>Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b)</p> <p>From: 05-Aug-24 To: 22-Aug-24</p>	<p>The best available estimate is not precise enough to conclude that the database is accurate within <math>\pm 5.0\%</math> which could result in under submission of 15,600 kWh p.a.</p> <p>Five lamp models had some lamps with a wattage inconsistent with their description, and have been checked and had their wattages and/or descriptions updated during the audit. The lights with confirmed incorrect wattages resulted in potential over submission of 401.5 kWh per annum until they were corrected.</p> <p>13 lights had incorrect road names but correct GPS coordinates.</p> <p>Potential impact: High Actual impact: Medium Audit history: Multiple times Controls: Moderate Breach risk rating: 4</p>	
Audit risk rating	Rationale for audit risk rating	
<p><b>Medium</b></p>	<p>The controls are moderate because the best available estimate is not precise enough to conclude that the database is accurate within <math>\pm 5.0\%</math>.</p> <p>The audit risk rating is medium based on kWh variances. UHCC intends to investigate and resolve all the discrepancies.</p>	
Actions taken to resolve the issue	Completion date	Remedial action status
<p>UHCC is in the process of investigating discrepancies identified during the audit.</p>	<p>15/10/2024</p>	<p>Investigating</p>

Preventative actions taken to ensure no further issues will occur	Completion date	
Fulton Hogan carry out field audits to identify mismatches in the field, during the night and resolve these through updating the database.		

### 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

##### Submission process and accuracy

Genesis reconciles the DUML load as NHH using the GSL profile. The correct submission types and profiles are recorded on the registry.

- Wattages are derived from a snapshot extract from the database provided by UHCC monthly.
- On and off times are derived from data logger information.

UHCC uses a SQL script to produce the monthly extracts for Genesis, because the downloads from RAMM's AMDS do not contain all the required fields. As recorded in previous audits, a monthly snapshot is not sufficient to calculate submission from. The code requires that submissions must account for when each item of load was physically installed or removed, and wash up volumes must account for historical corrections.

I reviewed the submission information for July 2024 and confirmed that it the calculation methodology was correct, with wattages based on database extract totals and on hours based on data logger information.

##### Database accuracy

Examination of the database found:

Issue	Estimated volume information impact (annual kWh)
The best available estimate is not precise enough to conclude that the database is accurate within $\pm 5.0\%$ . UHCC intends to investigate and update the discrepancies found during the field audit.	Under submission of 15,600 kWh p.a.

Issue	Estimated volume information impact (annual kWh)
Five lamp models had some lamps with a wattage inconsistent with their description, and two lamp models had luminaire models inconsistent with the lamp model. UHCC intends to investigate and update these discrepancies.	The lights with confirmed incorrect wattages resulted in potential over submission of 401.5 kWh per annum until they were corrected.

**Audit outcome**

Non-compliant

Non-compliance	Description	
<p>Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c)</p> <p>From: 05-Aug-24 To: 22-Aug-24</p>	<p>The best available estimate is not precise enough to conclude that the database is accurate within <math>\pm 5.0\%</math> which could result in under submission of 15,600 kWh p.a.</p> <p>Five lamp models had some lamps with a wattage inconsistent with their description, and have been checked and had their wattages and/or descriptions updated during the audit. The lights with confirmed incorrect wattages resulted in potential over submission of 401.5 kWh per annum until they were corrected.</p> <p>The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.</p> <p>Potential impact: Medium Actual impact: Medium Audit history: Multiple times Controls: Moderate Breach risk rating: 4</p>	
Audit risk rating	Rationale for audit risk rating	
<b>Medium</b>	<p>The controls are moderate because the best available estimate is not precise enough to conclude that the database is accurate within <math>\pm 5.0\%</math>.</p> <p>The audit risk rating is medium based on kWh variances. UHCC intends to investigate and resolve all the discrepancies.</p>	
Actions taken to resolve the issue	Completion date	Remedial action status
UHCC is in the process of investigating discrepancies identified during the audit.	15/10/2024	Investigating
Preventative actions taken to ensure no further issues will occur	Completion date	
Fulton Hogan carry out field audits to identify mismatches in the field, during the night and resolve these through updating the database.		

## CONCLUSION

A field audit was undertaken of a statistical sample of 385 items of load on 20 to 22 August 2024. The field audit found that the best available estimate is not precise enough to conclude that the database is accurate within  $\pm 5.0\%$ . In absolute terms, total annual consumption is estimated to be 15,600 kWh higher than the DUMML database indicates.

The audit found four non-compliances and made two recommendations. The future risk rating of 14 indicates that the next audit be completed in 12 months and I agree with this recommendation. Accuracy improvement has occurred during the audit period and further improvement is expected.

The matters raised are detailed in the tables below.

## PARTICIPANT RESPONSE

Genesis Energy and the Upper Hutt City Council would like to thank the auditor for their thorough review of the database and their work in the field.

The Council is working to remedy and inconsistencies identified during this audit in the field and the database as soon as possible with several locations already having been investigated and resolved.

Recommendations made in this audit have been responded to and will be adopted by the Council and Genesis to improve compliance, where possible.

Genesis and the Council agree that the next audit should be completed in 12 months, allowing time for the Council to remedy all inconsistencies and improve controls in the field and with new connections, particularly of private lights, to minimise the risk of future inconsistencies such as these.