

ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

NAPIER CITY COUNCIL AND
GENESIS ENERGY

Prepared by: Steve Woods

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Date audit report completed: 10 March 2023

Audit report due date: 10-Mar-23

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EXECUTIVE SUMMARY

This audit of the **Napier City Council Unmetered Streetlights (NCC)** DUML database and processes was conducted at the request of **Genesis Energy Limited (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.

A RAMM database is managed by NCC, and monthly reporting is provided to Genesis. The database is remotely hosted by thinkproject New Zealand Ltd. The database management is completed by NCC. Power Solutions Limited continue to produce the monthly report.

The database accuracy has declined during the audit period and is outside of the +/-5% allowable threshold resulting in an estimated over submission of 137,000 kWh per annum. This will be due to changes made in the field not being updated in the database.

The last audits noted four main issues. I have updated the status of these in the table below:

Issue	2022 Findings
The load for two ICPs is only on for half of the night (turned off at midnight), but submission occurs using the NSP profile, which is a full night profile, therefore the load is spread over the whole night when it should not be.	Still existing
ICP identifiers are linked to pole information not light information in RAMM, therefore PSL makes an adjustment in the monthly report to correct the ICP. Manual manipulation of the database output can lead to errors, and I strongly recommend the database is corrected and manual manipulation ceases as soon as possible.	Still existing
Submission is not occurring for 158 private lights recorded in the database, 44 of the 170 have NCC ICP identifiers.	Still existing - I have analysed these lights based on the last Unison audit and determined that 46 of these are likely to belong to NCC. These have been passed to Genesis to work with the council to get corrected.
Discrepancies found in previous field audits not corrected in the database.	Still existing - I have repeated the last audit's recommendation for Genesis to engage with the council to review the change management process to ensure all additions or removals are captured from the correct date.

This audit found five non-compliance and makes two recommendations. The future risk rating of 33 indicates that the next audit be completed in three months. I have considered this in conjunction with Genesis' comments, the current state of emergency in the Hawkes Bay and recommend that the next audit be in nine months' time.

The matters raised are detailed below:

AUDIT SUMMARY

NON-COMPLIANCES

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Deriving submission information	2.1	11(1) of Schedule 15.3	<p>NST profile used for ICPs 0000939921HBE61 and 0000939923HBEE4 which are turned off at midnight.</p> <p>In absolute terms, total annual consumption is estimated to be 137,000 kWh lower than the DUML database indicates resulting in over submission to the market.</p> <p>12 items of load with the incorrect ballast recorded resulting in an estimated very minor estimated under submission of 198 kWh.</p> <p>46 lights incorrectly recorded as "PRIVATE" and excluded from submission resulting in a potential estimated under submission of 20,403 kWh.</p>	Weak	High	9	Identified
ICP identifier and items of load	2.2	11(2)(a) and (aa) of Schedule 15.3	Nine items of load with no ICP and incorrectly recorded as "PRIVATE".	Weak	Low	3	Identified
All load recorded in database	2.5	11(2A) of Schedule 15.3	<p>Errors are still present from previous audits.</p> <p>Three additional lights were found in the field of 372 items of load sampled.</p>	Weak	Low	3	Identified

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Database accuracy	3.1	15.2 and 15.37B(b)	<p>In absolute terms, total annual consumption is estimated to be 137,000 kWh lower than the DUML database indicates resulting in over submission to the market.</p> <p>Incorrect ICP identifiers because they are against the pole not the light.</p> <p>46 lights incorrectly recorded as "PRIVATE" and excluded from submission resulting in a potential estimated under submission of 20,403 kWh.</p> <p>12 items of load with the incorrect ballast recorded resulting in an estimated very minor estimated under submission of 198 kWh.</p> <p>17 items of load with the incorrect ICP identifier recorded.</p>	Weak	High	9	Identified

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Volume information accuracy	3.2	15.2 and 15.37B(c)	<p>NST profile used for ICPs 0000939921HBE61 and 0000939923HBEE4 which are turned off at midnight.</p> <p>In absolute terms, total annual consumption is estimated to be 137,000 kWh lower than the DUML database indicates resulting in over submission to the market.</p> <p>12 items of load with the incorrect ballast recorded resulting in an estimated very minor estimated under submission of 198 kWh.</p> <p>46 lights incorrectly recorded as "PRIVATE" and excluded from submission resulting in a potential estimated under submission of 20,403 kWh.</p>	Weak	High	9	Identified
Future Risk Rating						33	

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

RECOMMENDATIONS

Subject	Section	Description
Deriving submission information	2.1	Apply for profile to address the incorrect allocation of volume associated with the "half night" lights.
Database accuracy	3.1	Review the change management process to ensure that all changes are recorded in RAMM for the correct date.

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

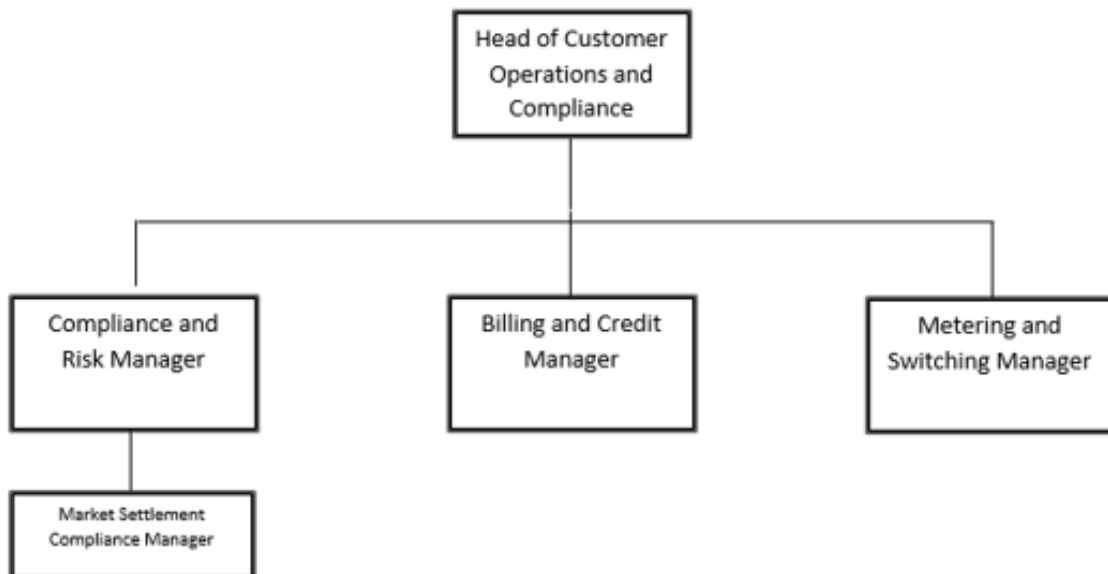
Section 11 of the Electricity Industry Act provides for the Electricity Authority to exempt any participant from compliance with all or any of the clauses.

Audit commentary

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

1.2. Structure of Organisation

Genesis provided the relevant organisational structure:



1.3. Persons involved in this audit

Auditor:

Name	Title
Steve Woods	Auditor
Rebecca Elliot	Supporting Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Nirav Teli	DUML Data & Stakeholder Lead	Genesis Energy
Jon Stevens	Projects Engineer	Power Solutions

1.4. Hardware and Software

The SQL database used for the management of DUML is remotely hosted by thinkproject New Zealand Ltd. The database is commonly known as “RAMM” which stands for “Roading Asset and Maintenance Management”.

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

Systems used by the trader to calculate submissions are assessed as part of their reconciliation participant audits.

1.5. Breaches or Breach Allegations

There are no breach allegations relevant to the scope of this audit.

1.6. ICP Data

ICP Number	Description	NSP	Profile	Number of items of load	Database wattage (watts)
0000939920HB224	Marine Parade Lighting	RDF0331	NST	19	1,840
0000939921HBE61	Carriageway Lighting	RDF0331	NST	162	14,317
0000939923HBEE4	Amenity Lighting	RDF0331	NST	82	4,763
0000939906HBEFE	Road Lighting	RDF0331	NST	7,588	419,205
0000939908HBD65	Amenity Lighting	RDF0331	NST	1,138	81,295
Total				8,989	521,420

As reported in the last audit report there are 159 lights where the ICP is reported as private. 44 of these have one of the NCC unmetered load ICPs recorded. This is discussed in **section 2.2**.

1.7. Authorisation Received

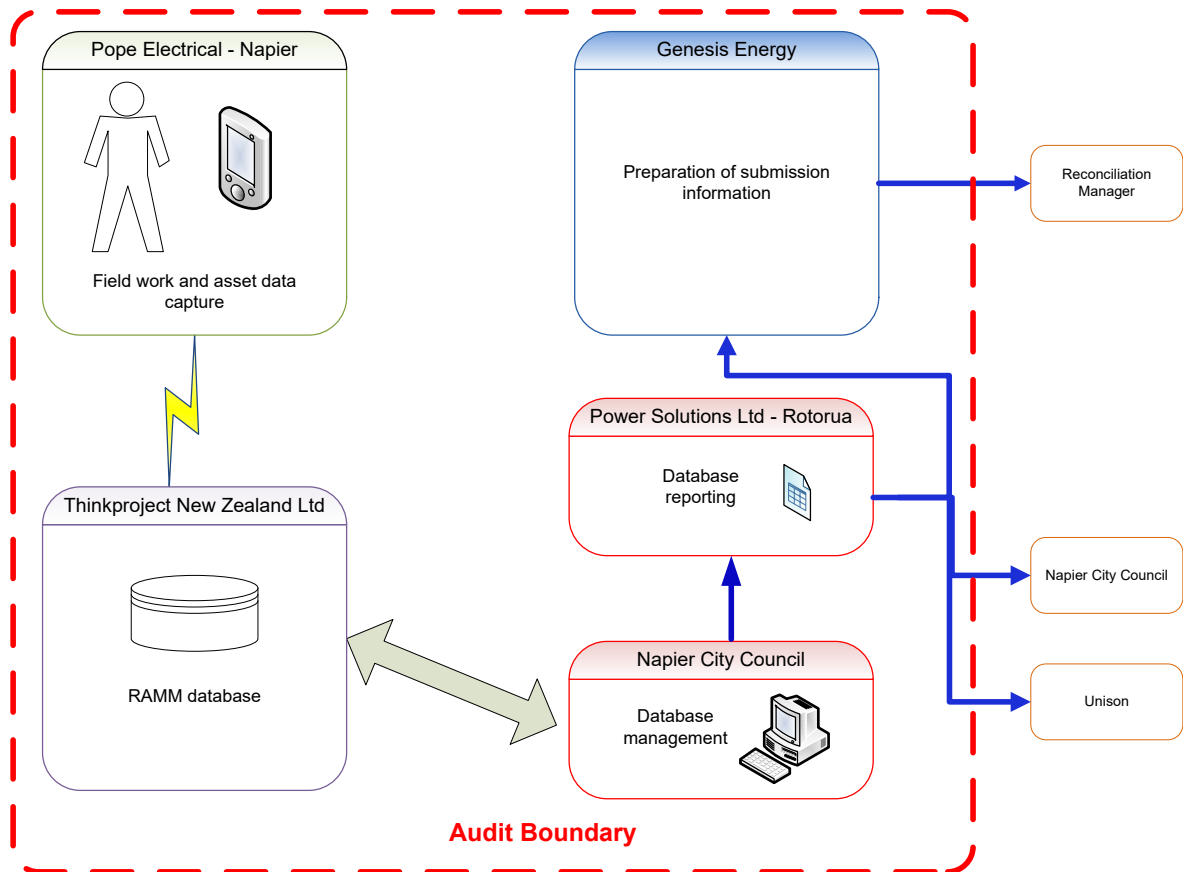
All information was provided directly by Genesis or Power Solutions.

1.8. Scope of Audit

This audit of the Napier City Council Unmetered Streetlights (NCC) DUML database and processes was conducted at the request of Genesis Energy Limited (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 database is remotely hosted by thinkproject New Zealand Ltd. The fieldwork and asset data capture is conducted by Pope Electrical. NCC manage the database. Power Solutions produce the monthly report, which is provided to NCC, Unison and Genesis. 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 audit was carried out in Napier on 14th December 2022. A field audit was conducted of 372 items of load.

1.9. Summary of previous audit

I reviewed that last audit report undertaken by Rebecca Elliot of Veritek Limited in May 2022. The current statuses of that audit's findings are shown in the tables below.

Table of Non-Compliance

Subject	Section	Clause	Non-Compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	<p>In absolute terms, total annual consumption is estimated to be 41,100 kWh lower than the DUML database indicates.</p> <p>Some database discrepancies identified in the previous three audits still to be corrected.</p> <p>Some right of way, amenity and car park lights are incorrectly recorded as connected to the NCC unmetered streetlight ICPs.</p> <p>NST profile used for ICPs 0000939921HBE61 and 0000939923HBEE4 which are turned off at midnight.</p> <p>Errors are still present from the last three audits resulting in submission inaccuracy.</p> <p>44 private lights recorded against NCC ICPs excluded from submission resulting in an estimated under submission of 26,630 kWh.</p>	<p>Still existing</p> <p>Still existing</p> <p>Cleared</p> <p>Still existing</p> <p>Still existing</p> <p>Still existing</p>
ICP identifier and items of load	2.2	11(2)(a) and (aa) of Schedule 15.3	ICP identifiers in the database are not correct.	Still existing
All load recorded in database	2.5	11(2A) of Schedule 15.3	<p>Errors are still present from the previous three field audit findings.</p> <p>Four additional lights found in the field of 418 items of load sampled.</p>	Still existing
Database accuracy	3.1	15.2 and 15.37B(b)	<p>In absolute terms, total annual consumption is estimated to be 41,100 kWh lower than the DUML database indicates.</p> <p>Incorrect ICP identifiers because they are against the pole not the light.</p> <p>Some right of way, amenity and car park lights are incorrectly recorded as connected to the NCC unmetered streetlight ICPs.</p> <p>17 items of load with the incorrect ballast recorded resulting in an estimated very minor estimated under submission of 224 kWh.</p> <p>44 private lights recorded against NCC ICPs excluded from submission resulting in an estimated under submission of 26,630 kWh.</p>	<p>Still existing</p> <p>Still existing</p> <p>Cleared</p> <p>Still existing</p> <p>Still existing</p>

Subject	Section	Clause	Non-Compliance	Status
Volume information accuracy	3.2	15.2 and 15.37B(c)	In absolute terms, total annual consumption is estimated to be 41,100 kWh lower than the DUML database indicates.	Still existing
			Some database discrepancies identified in the previous three audits still to be corrected.	Still existing
			Some right of way, amenity and car park lights are incorrectly recorded as connected to the NCC unmetered streetlight ICPs.	Cleared
			NST profile used for ICPs 0000939921HBE61 and 0000939923HBEE4 which are turned off at midnight.	Still existing
			Errors are still present from the last three audits resulting in submission inaccuracy.	Still existing
			44 private lights recorded against NCC ICPs excluded from submission resulting in an estimated under submission of 26,630 kWh.	Still existing

Table of Recommendations

Subject	Section	Non-Compliance	Status
Deriving submission information	2.1	Apply for profile to address the incorrect allocation of volume associated with the “half night” lights.	Not adopted
Database accuracy	3.1	Review the change management process to ensure that all changes are recorded in RAMM for the correct date.	Not adopted
		Genesis to work with NCC to determine the correct ICP for the 158 private lights to be reconciled against. For any found to be connected to a customer network, work with the EA to determine how these are to be reconciled.	Not adopted

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 Veritek to undertake this streetlight audit.

Audit commentary

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

Audit outcome

Compliant

2. DUML DATABASE REQUIREMENTS

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

Code reference

Clause 11(1) of Schedule 15.3

Code related audit information

The retailer must ensure the:

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

Audit observation

The process for calculation of consumption was examined and the application of profiles was checked. The database was checked for accuracy.

Audit commentary

Genesis reconciles this DUML load using the NST 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 data loggers installed on the Unison network. I checked the November 2022 submission and found as reported in the last audit that the content matched the database.

As reported in the two last audits, the methodology is compliant for the “full night” items of load but there are 244 items of load subject to “half night” switching. These lights are turned off at midnight, but the kWh is allocated over the entire night period. This does not achieve compliance with the rules of the profile and there is no approved profile that will meet this requirement. I repeat the last audit’s recommendation that a new profile be applied for to address this.

Recommendation	Description	Audited party comment	Remedial action
Deriving submission information	Apply for profile to address the incorrect allocation of volume associated with the “half night” lights.	Genesis Energy will discuss with Napier City Council if they are happy to have these streetlights metered and whether they are willing to assist with installation of a check meter so data can be validated before an application can be made for a new profile shape.	Identified

As was recorded in the last three audits changes made in the field are not always being updated in the database, including discrepancies from the last audit. The database accuracy level has declined and in absolute terms, total annual consumption is estimated to be 137,000 kWh lower than the DUML database indicates. This is outside the allowable +/- 5% variance threshold and is recorded as non-compliance below.

As detailed in **section 3.1**, a small number of lights have the incorrect ballast applied resulting in a very minor amount of under submission. This is recorded as non-compliance below.

As detailed in **section 2.2**, there are 159 items of load where the owner is recorded as private (this is an increase of one which was mistakenly excluded from the last report). 44 of these have an NCC ICP identifier assigned. All lights with a private owner are excluded from reconciliation. I have reviewed the last findings from the Unison Distributor audit report against the NCC private light list and found:

Volume of lights	Findings	Estimated kWh impact per annum
113	Confirmed as private or are part of a connection downstream of the Unison network	With EA or Unison to resolve
37	Suspected to have been originally requested by council and subsequently removed	19,104
9	NCC council lighting incorrectly recorded as private	1,298
TOTAL		20,403

These findings have been passed to Genesis to work with NCC to resolve these. The potential estimated under submission is recorded as non-compliance in **sections 2.1, 3.1 and 3.2**.

Database reporting is provided and includes changes made at a daily level and therefore meets compliance with this code requirement.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 30-May-22 To: 01-Dec-22	NST profile used for ICPs 0000939921HBE61 and 0000939923HBEE4 which are turned off at midnight. In absolute terms, total annual consumption is estimated to be 137,000 kWh lower than the DUML database indicates resulting in over submission to the market. 12 items of load with the incorrect ballast recorded resulting in an estimated very minor estimated under submission of 198 kWh. 46 lights incorrectly recorded as "PRIVATE" and excluded from submission resulting in a potential estimated under submission of 20,403 kWh. Potential impact: High Actual impact: High Audit history: Multiple times Controls: Weak Breach risk rating: 9
Audit risk rating	Rationale for audit risk rating
High	The controls are rated as weak as the field findings indicate that the database management processes have not improved during the audit period. The impact is assessed to high due to the potential impact on settlement accuracy.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis will investigate and discuss with NCC if they are happy to assist with installation of a check meter to have a profile shape created. Genesis has notified PSL of the discrepancies for the incorrect ballast with an intent these exceptions are rectified. Genesis has reviewed the auditors finding and have advised NCC of the discrepancy around the lights that are recorded as "Private" with the intent that NCC makes every effort to ensure the exceptions are rectified.	10/07/2023	Identified
Preventative actions taken to ensure no further issues will occur	Completion date	
Genesis is trying to get council's engagement so discrepancies can be resolved	10/07/2023	

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

Code reference

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

Code related audit information

The DUML database must contain:

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

Audit observation

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

Audit commentary

As reported in the last few audits, there are 159 items of load where the owner is recorded as private. 44 of these have an NCC ICP identifier assigned. All lights with a private owner are excluded from reconciliation. I have reviewed the last findings from the Unison Distributor audit report against the lights provided and found:

Volume of lights	Findings	Estimated kWh impact per annum
113	Confirmed as private or are part of a connection downstream of the Unison network	With EA or Unison to resolve
37	Suspected to have been originally requested by council and subsequently removed	19,104
9	NCC council lighting incorrectly recorded as private	1,298
TOTAL		20,403

These findings have been passed to Genesis to work with NCC to resolve these. The potential estimated under submission is recorded as non-compliance in **sections 2.1, 3.1 and 3.2.**

In regard to all items of load expected to be associated with an ICP, I found nine items of load which belong to NCC but where the ICP is recorded as "PRIVATE". This is recorded as non-compliance below.

The accuracy of the ICPs allocated is discussed in **section 3.1.**

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.2 With: Clause 11(2)(a) and (aa) of Schedule 15.3 From: 30-May-22 To: 01-Dec-22	Nine items of load with no ICP and incorrectly recorded as "PRIVATE". Potential impact: Low Actual impact: Low Audit history: Multiple times Controls: Weak Breach risk rating: 3		
Audit risk rating	Rationale for audit risk rating		
Low	The controls are rated as weak because the design of the database does not ensure ICP identifiers are correct. The audit risk rating is low as there were only nine items of load without an ICP associated.		
Actions taken to resolve the issue		Completion date	Remedial action status
Genesis has reviewed the auditors finding and have advised NCC of the discrepancy with the intent that NCC makes every effort to ensure the exceptions are rectified.		10/06/2023	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
Genesis is trying to get council's engagement so discrepancies can be resolved		10/06/2023	

2.3. Location of each item of load (Clause 11(2)(b) of Schedule 15.3)

Code reference

Clause 11(2)(b) of Schedule 15.3

Code related audit information

The DUMML database must contain the location of each DUMML item.

Audit observation

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

Audit commentary

The database contains the nearest street address, displacement value and pole numbers and Global Positioning System (GPS) coordinates for the majority of items of load, and users in the office and field can view these locations on a mapping system.

There are 191 items of load that do not have GPS co-ordinates, but all have a road name and displacement value which enable these to be located.

Audit outcome

Compliant

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

Code reference

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

Code related audit information

The DUMML database must contain:

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

Audit observation

The database was checked to confirm that it contained a field for lamp type and wattage capacity and included any ballast or gear wattage and that each item of load had a value recorded in these fields.

Audit commentary

The database contains two records for wattage, firstly the lamp wattage and secondly the gear wattage, which represents ballast losses. Analysis of the database found no blank records and no discrepancies.

The issue where the ballast in RAMM was not being used for submission has been corrected. The wattage report is calculated using the wattage and ballast from RAMM.

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 DUMML for which it is responsible is recorded in this database.

Audit observation

A field audit was undertaken of 372 items of load on 14th December 2022. The discrepancies found in the field are detailed below.

Audit commentary

Field discrepancies identified were:

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
FAULKNOR STREET	1	1	-	1	1x 24W LED found in the field but recorded in the database as 24.1W. There are 388 of this light type in the database.
GOLDSMITH TERRACE	3	3	-	1	1x 20W LED found in the field but recorded in the database as 70W HPS.
HUMBER STREET	6	6	-	2	2x 80W LED found in the field but recorded in the database as 250W HPS.
HUNTER DRIVE RIGHT ARM	3	6	+3	1	3x additional 58W LED not found in the field. These are the same lights identified in the last field audit- therefore the database hasn't been corrected. 1x 20W LED found in the field but recorded in the database as 70W HPS.
ISLINGTON PLACE EXT.	1	1	-	1	1x 24W LED found in the field but recorded in the database as 24.1W.
MARINE PARADE EAST FORESHORE RESERVE	21	15	-6	-	6x 125W MV/100W HPS not found in the field.
MASSEY CRESCENT	20	20	-	1	1x 24W LED found in the field but recorded in the database as 24.1W.
TAREHA STREET WESTSHORE	5	5	-	2	2x 24W LEDs found in the field but recorded in the database as 24.1W.
TURNER PLACE	5	5	-	5	5x 24W LEDs found in the field but recorded in the database as 24.1W.
WAVERLEY ROAD EAST	1	1	-	1	1x 24W LED found in the field but recorded in the database as 24.1W.
WILDING AVENUE	3	3	-	1	1x20W LED found in the field but recorded in the database as 80W.
Grand Total	372	369	9 (+3-6)	16	

Three additional lights were found in the field. As noted above, these are the same lights identified in the last field audit and is evidence that the database hasn't been corrected. This is recorded as non-compliance.

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

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3 From: 30-May-22 To: 01-Dec-22	Errors are still present from previous audits. Three additional lights were found in the field of 372 items of load sampled. Potential impact: Medium Actual impact: Low Audit history: Three times previously Controls: Weak Breach risk rating: 3		
Audit risk rating	Rationale for audit risk rating		
Low	The controls are recorded as weak as the processes in place do not ensure that the changes in the database are updated. The impact is assessed to be low based on number of additional lights found in the field in comparison to the overall number of lights checked.		
Actions taken to resolve the issue		Completion date	Remedial action status
Genesis is trying to get council's engagement so discrepancies can be resolved.		10/07/2023	Identified
Genesis has notified PSL of additional lights found in field. PSL is going to arrange for a contractor to go on site and update RAMM.		10/07/2023	
Preventative actions taken to ensure no further issues will occur		Completion date	
Genesis is trying to get council's engagement so discrepancies can be resolved.		10/07/2023	

2.6. Tracking of load changes (Clause 11(3) of Schedule 15.3)

Code reference

Clause 11(3) of Schedule 15.3

Code related audit information

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

Audit observation

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

Audit commentary

The RAMM database functionality achieves compliance with the code.

Audit outcome

Compliant

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

Code reference

Clause 11(4) of Schedule 15.3

Code related audit information

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

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

Audit observation

The database was checked for audit trails.

Audit commentary

The RAMM database has a complete audit trail of all additions and changes to the database information.

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	Napier City Council streetlights
Strata	The database contains items of load in the Napier City Council area. The processes for the management of items of load are the same, but I decided to place the items of load into four strata, as follows: <ul style="list-style-type: none"> • A-EI, • Em-La, • Le-Pa, and • Pe-Y.
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 59 sub-units.
Total items of load	372 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.

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

Audit commentary

Database accuracy based on the field audit

A field audit was conducted of a statistical sample of 372 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	93.8	Wattage from survey is lower than the database wattage by 6.2%
R _L	85.4	With a 95% level of confidence, it can be concluded that the error could be between- 0.6% and -14.6%
R _H	99.4	

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 B (detailed below) applies.

The conclusion from Scenario B is that the database has poor accuracy demonstrated with statistical significance. The true wattage (installed in the field) is between 0.6% and 14.6% lower 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 32 kW lower than the database indicates.

There is a 95% level of confidence that the installed capacity is between 3 kW and 76 kW lower than the database.

In absolute terms, total annual consumption is estimated to be 137,000 kWh lower than the DUMML database indicates.

There is a 95% level of confidence that the annual consumption is between 14,100 kWh p.a. and 362,200 kWh p.a. lower than the database indicates.

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

ICP Accuracy including private lights

ICP identifiers are still linked to pole information not light information, therefore PSL makes an adjustment in the monthly report to correct the ICP. This is recorded as non-compliance below.

As reported in the last few audits, there are 159 items of load where the owner is recorded as private. 44 of these have an NCC ICP identifier assigned. All lights with a private owner are excluded from reconciliation regardless of the ICP identifier recorded. I have reviewed the last findings from the Unison Distributor audit report against the lights provided and found:

Volume of lights	Findings	Estimated kWh impact per annum
113	Confirmed as private or are part of a connection downstream of the Unison network	With EA or Unison to resolve
37	Suspected to have been originally requested by council and subsequently removed	19,104
9	NCC council lighting incorrectly recorded as private	1,298
TOTAL		20,403

As detailed above, 113 of the lights are in rest homes, council flats or commercial premises and could be the responsibility of the owner of the customer network, depending on how they are connected. If they are connected to a customer network, then there is an issue with how these are recorded as they are not connected to Unison network so cannot be created as unmetered load and do not belong to the council. This will be raised as an issue in Unison next audit but is not the responsibility of Genesis in relation to NCC. The remaining 46 lights have been passed to Genesis to work with NCC to resolve these. The potential estimated under submission is recorded as non-compliance in **sections 2.1** and **3.2**.

In regard to all the items of load expected to be associated with an ICP, I found nine items of load which belong to NCC but where the ICP is recorded as "PRIVATE" and nine items of private load with a NCC ICP incorrectly recorded against them. This is recorded as non-compliance below and in **section 2.2**.

Wattage and ballast accuracy findings

The database contains two records for wattage, firstly the lamp wattage and secondly the gear wattage, which represents ballast losses. Analysis of the database found no blank records and as was found in the last audit, a small number of incorrect ballasts as detailed below:

Light Type	Ballast applied	Correct ballast	No. of lights	Wattage Difference
14W Fluorescent	2	3.8	3	5.4
36W Fluorescent	7	10	7	28
58W Fluorescent	7	14	1	7
70W Metal Halide	7	13	1	7
Total			12	46.4

This will be resulting in an estimated very minor under submission of 198 kWh per annum.

Change management process findings

The database is managed by NCC. Pope Electrical conduct the field work. PSL produce the monthly wattage report.

As was found in the last two audits, we were unable to meet with the council to discuss how the change management processes are being managed. The field audit results indicate that not all changes/new connections in the field are being updated in the database. I repeat the last audit's recommendation that the change management process is reviewed to ensure all changes are captured for the correct date.

Description	Recommendation	Audited party comment	Remedial action
Database Accuracy	Review the change management process to ensure that all changes are recorded in RAMM for the correct date.	Genesis is trying to get council's engagement so change management can be discussed and improved.	Identified

Audit outcome

Non-compliant

Non-compliance	Description		
<p>Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b)</p> <p>From: 13-May-21 To: 30-May-22</p>	<p>In absolute terms, total annual consumption is estimated to be 137,000 kWh lower than the DUML database indicates resulting in over submission to the market.</p> <p>Incorrect ICP identifiers because they are against the pole not the light.</p> <p>46 lights incorrectly recorded as "PRIVATE" and excluded from submission resulting in a potential estimated under submission of 20,403 kWh.</p> <p>12 items of load with the incorrect ballast recorded resulting in an estimated very minor estimated under submission of 198 kWh.</p> <p>18 items of load with the incorrect ICP identifier recorded.</p> <p>Potential impact: High Actual impact: High Audit history: Twice previously Controls: Weak Breach risk rating: 9</p>		
Audit risk rating	Rationale for audit risk rating		
High	<p>The controls are rated as weak as the field findings indicate that the database management processes do not track changes made in the field especially in relation to the addition of new lights to the database.</p> <p>The impact on settlement and participants is assessed to be high.</p>		
Actions taken to resolve the issue		Completion date	Remedial action status
<p>NCC has been notified of the discrepancies. Genesis relies on NCC to accurately maintain its database.</p> <p>Genesis has notified PSL about auditor's findings to have ICP identifiers listed against light with an intent that actions is taken to have this rectified.</p> <p>PSL have been notified about the incorrect ballast recorded.</p>		10/07/2023	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
Genesis is trying to get council's engagement so discrepancies can be resolved		10/07/2023	

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

Genesis reconciles this DUML load using the NST 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 data loggers installed on the Unison network. I checked the November 2022 submission and found as reported in the last audit that the content matched the database.

As reported in the two last audits, the methodology is compliant for the “full night” items of load but there are 244 items of load subject to “half night” switching. These lights are turned off at midnight, but the kWh is allocated over the entire night period. This does not achieve compliance with the rules of the profile and there is no approved profile that will meet this requirement. I repeat the last audit’s recommendation that a new profile be applied for to address this in **section 2.1**.

As was recorded in the last three audits, changes made in the field are not always being updated in the database, including discrepancies from the last audit. The database accuracy level has declined and in absolute terms, total annual consumption is estimated to be 137,000 kWh lower than the DUML database indicates. This is outside the allowable +/- 5% variance threshold and is recorded as non-compliance below.

As detailed in **section 3.1**, a small number of lights have the incorrect ballast applied resulting in a very minor amount of under submission. This is recorded as non-compliance below.

As detailed in **section 2.2**, there are 159 items of load where the owner is recorded as private. 44 of these have an NCC ICP identifier assigned. All lights with a private owner are excluded from reconciliation. I have reviewed the last findings from the Unison Distributor audit report against the NCC private light list and found:

Volume of lights	Findings	Estimated kWh impact per annum
113	Confirmed as private or are part of a connection downstream of the Unison network	With EA or Unison to resolve
37	Suspected to have been originally requested by council and subsequently removed	19,104
9	NCC council lighting incorrectly recorded as private	1,298

TOTAL	20,403
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These findings have been passed to Genesis to work with NCC to resolve these. The potential estimated under submission is recorded as non-compliance in **sections 2.1, 3.1 and 3.2.**

Database reporting is provided and includes changes made at a daily level and therefore meets compliance with this code requirement.

Audit outcome

Non-compliant

Non-compliance	Description	
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: 30-May-22 To: 01-Dec-22	NST profile used for ICPs 0000939921HBE61 and 0000939923HBEE4 which are turned off at midnight. In absolute terms, total annual consumption is estimated to be 137,000 kWh lower than the DUML database indicates resulting in over submission to the market. 12 items of load with the incorrect ballast recorded resulting in an estimated very minor estimated under submission of 198 kWh. 46 lights incorrectly recorded as "PRIVATE" and excluded from submission resulting in a potential estimated under submission of 20,403 kWh. Potential impact: High Actual impact: High Audit history: Multiple times Controls: Weak Breach risk rating: 9	
Audit risk rating	Rationale for audit risk rating	
High	The controls are rated as weak as the field findings indicate that the database management processes have not improved during the audit period. The impact is assessed to high due to the potential impact on settlement accuracy.	
Actions taken to resolve the issue	Completion date	Remedial action status
Genesis will discuss with NCC if they are happy to assist with installation of a check meter to have a profile shape created. Genesis has notified PSL of the discrepancies for the incorrect ballast with an intent these exceptions are rectified. Genesis has reviewed the auditors finding and have advised NCC of the discrepancy around the lights that are recorded as "Private" with the intent that NCC makes every effort to ensure the exceptions are rectified.	10/07/2023	Identified
Preventative actions taken to ensure no further issues will occur	Completion date	

Genesis is trying to get council's engagement so discrepancies can be resolved	10/07/2023	
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CONCLUSION

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

A RAMM database is managed by NCC, and monthly reporting is provided to Genesis. The database is remotely hosted by thinkproject New Zealand Ltd. The database management is completed by NCC. Power Solutions Limited continue to produce the monthly report.

The database accuracy has declined during the audit period and is outside of the +/-5% allowable threshold resulting in an estimated over submission of 137,000 kWh per annum. This will be due to changes made in the field not being updated in the database.

The last audits noted four main issues. I have updated the status of these in the table below:

Issue	2022 Findings
The load for two ICPs is only on for half of the night (turned off at midnight), but submission occurs using the NSP profile, which is a full night profile, therefore the load is spread over the whole night when it should not be.	Still existing
ICP identifiers are linked to pole information not light information in RAMM, therefore PSL makes an adjustment in the monthly report to correct the ICP. Manual manipulation of the database output can lead to errors, and I strongly recommend the database is corrected and manual manipulation ceases as soon as possible.	Still existing
Submission is not occurring for 158 private lights recorded in the database, 44 of the 170 have NCC ICP identifiers.	Still existing- I have analysed these lights based on the last Unison audit and determined that 46 of these are likely to belong to NCC. These have been passed to Genesis to work with the council to get these corrected.
Discrepancies found in previous field audits not corrected in the database.	Still existing- I have repeated the last audit's recommendation for Genesis to engage with the council to review the change management process to ensure all additions or removals are captured from the correct date.

This audit found five non-compliance and makes two recommendations. The future risk rating of 33 indicates that the next audit be completed in three months. I have considered this in conjunction with Genesis' comments, the current state of emergency in the Hawkes Bay and recommend that the next audit be in nine months time.

PARTICIPANT RESPONSE

Genesis continues to build on their relationship with PSL and will continue to try and engage with council.

With the current state of emergency declared in the region Genesis understands there are much bigger issues council will have to attend to and we would like to request if a longer audit period can be provided so we can engage with the council and make some progress on the issues identified.