

ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT



For

HOROWHENUA DISTRICT COUNCIL AND
CONTACT ENERGY LIMITED
NZBN: 9429038549977

Prepared by: Tara Gannon

Date audit commenced: 21 September 2022

Date audit report completed: 31 October 2022

Audit report due date: 18 March 2023

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EXECUTIVE SUMMARY

This audit of the **Horowhenua District Council (HDC)** DUML database and processes was conducted at the request of **Contact Energy Limited (Contact)** in accordance with clause 15.37B. The purpose of this audit is to verify that the volume information is being calculated accurately, and that profiles have been correctly applied. HDC is supplied under Contact's CTCS participant code, and **Simply Energy** manages registry, switching, and submission data for CTCS as Contact's agent.

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 load is determined by wattages held within HDC's RAMM database, and a monthly extract is provided to Contact. New connection, fault, maintenance, and upgrade work is completed by Fulton Hogan. All contractors completing work on HDC's streetlights have access to RAMM and update the database using Pocket RAMM from the field.

The HDC Parks and Property team are responsible for 116 lights located in HDC owned properties and parks. They do not always use Fulton Hogan to complete field work and are expected to notify the Roding Operations Team where light details change so that RAMM can be updated where Fulton Hogan is not involved. During the field audit I found that some changes to Parks and Property lights were not updated in the database, and I have recommended that the process to communicate and update changes to these lights is reviewed.

Contact reconciles the DUML load as NHH using the DST profile, with wattages derived from the most recent database extract provided by HDC and on and off times derived from data logger information.

A field audit was conducted of a statistical sample of 250 items of load and results were analysed using the "database auditing tool". I found that the database had poor accuracy, demonstrated with statistical significance. There is a 95% level of confidence that the annual consumption is estimated to be between 55,300 kWh lower and 1,700 kWh higher than the database indicates. The exceptions identified during the field audit were provided to HDC and updated in RAMM during the audit.

Analysis of the whole database found that lamp and gear wattages were consistent with expected values for the lamp models listed, and a very small number of lights had missing lamp model, wattage and/or ICP information. The missing information was populated in RAMM during the audit.

The future risk rating of 15 indicates that the next audit be completed in 12 months. I have taken this into consideration along with Contact's comments which indicate that all of the discrepancies identified have been resolved, and recommend that the next audit is completed in 15 months on 18 June 2024.

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>The database is not confirmed as accurate with a 95% level of confidence. There is a 95% level of confidence that the annual consumption is estimated to be between 55,300 kWh lower and 1,700 kWh higher than the database indicates.</p> <p>Two items of load (pole IDs CX0435 17W LED and DX0328 27W LED) had a blank lamp make, lamp model, lamp wattage and gear wattage in RAMM resulting in under submission of 187.9 kWh p.a.</p> <p>Four items of load do not have an ICP number recorded in RAMM totalling 88W or 375 kWh per annum. There is no impact on submission because the missing ICP numbers were populated before sending the database extracts to Contact.</p>	Moderate	Medium	4	Identified
ICP identifier and items of load	2.2	11(2)(a) and (aa) of Schedule 15.3	Four items of load connected to ICP 0016099004EL9CA had blank ICP numbers in RAMM and were updated to during the audit.	Strong	Low	1	Identified
Description and capacity of load	2.4	11(2)(c) and (d) of Schedule 15.3	Two items of load (pole IDs CX0435 and DX0328) had a blank lamp make, lamp model, lamp wattage and gear wattage. The missing details were added during the audit.	Strong	Low	1	Identified
All load recorded in database	2.5	11(2A) of Schedule 15.3	<p>One L22 (pole CX0153) outside 4 Mark Perreau PI, Foxton is missing from the database.</p> <p>One unknown LED (estimated 17W) is missing from the database at Derby St, Levin.</p>	Strong	Low	1	Identified
Database accuracy	3.1	15.2 and 15.37B(b)	<p>The database is not confirmed as accurate with a 95% level of confidence. There is a 95% level of confidence that the annual consumption is estimated to be between 55,300 kWh lower and 1,700 kWh higher than the database indicates.</p> <p>Two items of load (pole IDs CX0435 17W LED and DX0328 27W LED) had a blank lamp make, lamp model, lamp wattage and gear wattage in RAMM</p>	Moderate	Medium	4	Identified

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
			<p>resulting in under submission of 187.9 kWh p.a.</p> <p>Four items of load do not have an ICP number recorded in RAMM totalling 88W or 375 kWh per annum. There is no impact on submission because the missing ICP numbers were populated before sending the database extracts to Contact.</p>				
Volume information accuracy	3.2	15.2 and 15.37B(c)	<p>The database is not confirmed as accurate with a 95% level of confidence. There is a 95% level of confidence that the annual consumption is estimated to be between 55,300 kWh lower and 1,700 kWh higher than the database indicates.</p> <p>Two items of load (pole IDs CX0435 17W LED and DX0328 27W LED) had a blank lamp make, lamp model, lamp wattage and gear wattage in RAMM resulting in under submission of 187.9 kWh p.a.</p> <p>Four items of load do not have an ICP number recorded in RAMM totalling 88W or 375 kWh per annum. There is no impact on submission because the missing ICP numbers were populated before sending the database extracts to Contact.</p>	Moderate	Medium	4	Identified
Future Risk Rating						15	

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	Recommendation
Process to update Parks and Property lights in RAMM	3.1	Confirm the process to ensure that RAMM is updated promptly when lights managed by the Parks and Property team are installed or changed.

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. Persons involved in this audit

Auditor:

Tara Gannon

Veritek Limited

Electricity Authority Approved Auditor

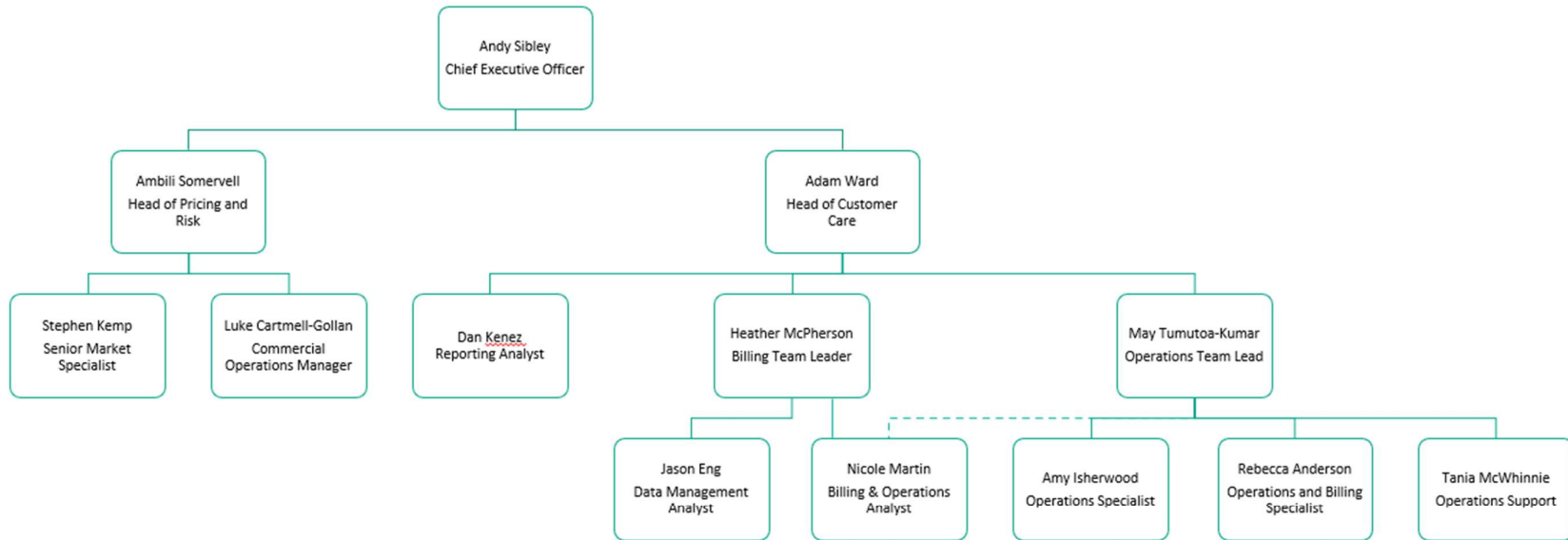
Other personnel assisting in this audit were:

Name	Title	Company
Brent Tucker	Roading Operations Team Leader	Horowhenua District Council
Dallas Tui	White Label Account Specialist	Simply Energy
Luke Cartmell-Gollan	Commercial Operations Manager	Simply Energy

1.3. Structure of Organisation

Simply Energy Compliance Organization Chart

1 Oct 2022



1.4. Hardware and Software

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.

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

Systems used by the trader, and their agents, 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	ICP status	NSP	Profile	Number of items of load	Database wattage (watts)
0016099004EL9CA	HDC - STREETLIGHTS	2,0	MHO0331	DST	2,569	83,657

1.7. Authorisation Received

All information was provided directly by Contact or HDC.

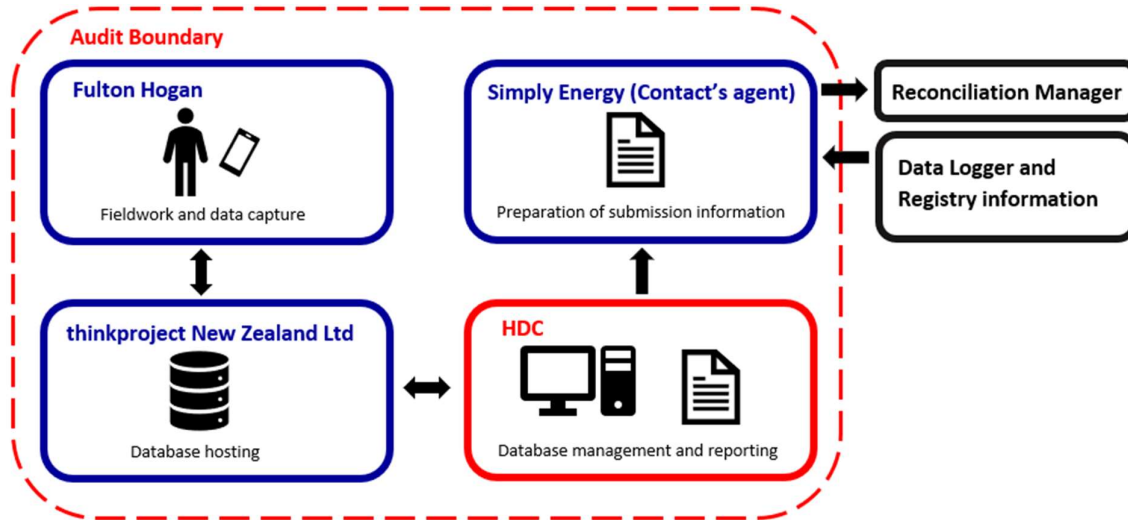
1.8. Scope of Audit

This audit of the HDC DUML database and processes was conducted at the request of Contact in accordance with clause 15.37B. The purpose of this audit is to verify that the volume information is being calculated accurately, and that profiles have been correctly applied. The audit was conducted in accordance with the audit guidelines for DUML audits version 1.1.

Streetlight load is determined by wattages held within HDC’s RAMM database, and a monthly extract is provided to Contact. New connection, fault, maintenance, and upgrade work is completed by Fulton Hogan. All contractors completing work on HDC’s streetlights have access to RAMM and update the database using Pocket RAMM from the field.

The HDC Parks and Property team are responsible for 116 lights located in HDC owned properties and parks. They do not always use Fulton Hogan to complete field work and are expected to notify the Roading Operations Team where light details change so that RAMM can be updated.

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 250 items of load on 4 October 2022.

1.9. Summary of previous audit

The previous audit of this database was undertaken by Steve Woods of Veritek Limited in September 2021. The summary table below shows the statuses of the non-compliances raised in the previous audit. Further comment is made in the relevant sections of this report.

Subject	Section	Clause	Non-compliance	Status
DUML audit	1.10	16A.26	Audit not completed within the required timeframe.	Cleared.
Deriving submission information	2.1	11(1) of Schedule 15.3	The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.	Cleared, but other non-compliance exists in this section. A process has been developed to provide change dates which are used to calculate the correct load for the month.
Volume information accuracy	3.2	15.2 and 15.37B(c)	The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.	Cleared, but other non-compliance exists in this section. A process has been developed to provide change dates which are used to calculate the correct load for the month.

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

Code reference

Clause 16A.26 and 17.295F

Code related audit information

Retailers must ensure that DUML database audits are completed:

1. by 1 June 2018 (for DUML that existed prior to 1 June 2017)
2. within three months of submission to the reconciliation manager (for new DUML)

3. *within the timeframe specified by the Authority for DUML that has been audited since 1 June 2017.*

Audit observation

Contact 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 within the required timeframe.

Audit outcome

Compliant

2. DUML DATABASE REQUIREMENTS

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

Code reference

Clause 11(1) of Schedule 15.3

Code related audit information

The retailer must ensure the:

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

Audit observation

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

Audit commentary

Contact reconciles this DUML load using the DST profile.

- Monthly wattage reports are provided by HDC. The database is not confirmed as accurate with a 95% level of confidence as recorded in **section 3.1**.
- On and off times are derived from data logger information.

I checked the submission data for August 2022 and found the load for 0016099004EL9CA had been correctly calculated based on the data logger and monthly extract information.

Examination of the database found:

Issue	Estimated volume information impact (annual kWh)
Two items of load (pole IDs CX0435 17W LED and DX0328 27W LED) had a blank lamp make, lamp model, lamp wattage and gear wattage in RAMM.	Under submission of 187.9 kWh p.a.
Four items of load (totalling 88W) do not have an ICP number recorded in RAMM.	No impact on submission. The missing ICP numbers were manually updated in the extract before it was sent to Contact and have now been updated in RAMM.

On 18 June 2019, the Electricity Authority issued a memo clarifying the memo of 2012 that stated that a monthly snapshot was sufficient to calculate submission from, and confirmed the code requirement to calculate the correct monthly load must:

- take into account when each item of load was physically installed or removed, and
- wash up volumes must take into account where historical corrections have been made to the DUML load and volumes.

The current monthly report is provided as a snapshot. When a wattage is changed in the database due to a physical change or a correction, only the record present at the time the report is run is recorded in the extract, not the historical information showing dates of changes. HDC provides the details of any wattage changes including the change date to Contact with the monthly extract. Contact uses this information to calculate the correct load across the month where changes have occurred. Contact and HDC confirmed that changes are rare now that the LED upgrade is complete. Contact completes revision submissions where corrections are required.

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: 21-Sep-22</p> <p>To: 04-Oct-22</p>	<p>The database is not confirmed as accurate with a 95% level of confidence. There is a 95% level of confidence that the annual consumption is estimated to be between 55,300 kWh lower and 1,700 kWh higher than the database indicates.</p> <p>Two items of load (pole IDs CX0435 17W LED and DX0328 27W LED) had a blank lamp make, lamp model, lamp wattage and gear wattage in RAMM resulting in under submission of 187.9 kWh p.a.</p> <p>Four items of load do not have an ICP number recorded in RAMM totalling 88W or 375 kWh per annum. There is no impact on submission because the missing ICP numbers were populated before sending the database extracts to Contact.</p> <p>Potential impact: Medium</p> <p>Actual impact: Low</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	
Medium	Controls are rated as moderate, as they are sufficient to mitigate the risk most of the time but there is room for improvement. The impact is assessed to be low, based on the low number of changes which occur in the database and the wattage differences identified.	
Actions taken to resolve the issue	Completion date	Remedial action status
Missing items added to RAMM during the audit	10.03.2023	Identified
Preventative actions taken to ensure no further issues will occur	Completion date	
HDC to look into making this field mandatory	10.03.2023	

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 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 was recorded against each item of load.

Audit commentary

The analysis found that all items of load had ICP 0016099004EL9CA validly recorded against them, except:

ICP group	Count of items	Total wattage	Comment
Private	87	6,877W	Private lights are not the responsibility of HDC. They are recorded in the database for completeness so that if a fault is logged for a private light the caller can be advised that the end user needs to arrange the repair. It is expected that private lights will be metered through the customer's installation, or the network should create standard or shared unmetered load as appropriate.
(blank)	4	88W	The missing ICP numbers were manually updated in the extract before it was sent to Contact and have now been updated in RAMM.

Audit outcome

Non-compliant

Non-compliance	Description		
<p>Audit Ref: 2.2</p> <p>With: Clause 11(2)(a) and (aa) of Schedule 15.3</p> <p>From: 21-Sep-22</p> <p>To: 21-Sep-22</p>	<p>Four items of load connected to ICP 0016099004EL9CA had blank ICP numbers in RAMM and were updated to during the audit.</p> <p>Potential impact: Low</p> <p>Actual impact: Low</p> <p>Audit history: None</p> <p>Controls: Strong</p> <p>Breach risk rating: 1</p>		
Audit risk rating	Rationale for audit risk rating		
Low	<p>The controls are strong because almost all items of load had valid ICP numbers recorded and RAMM was updated during the audit.</p> <p>There was no impact on submission. The missing ICP numbers were manually updated in the extract before it was sent to Contact and have now been updated in RAMM.</p>		
Actions taken to resolve the issue		Completion date	Remedial action status
Missing items added to RAMM during the audit		10.03.2023	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
HDC to look into making this field mandatory		10.03.2023	

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 fields for road names, house numbers, pole numbers and GPS coordinates.

2,540 (99.5%) of the 2,552 lamps connected to settled ICP 0016099004EL9CA have valid GPS coordinates recorded. The other 12 lamps have roads, pole location numbers and pole numbers recorded allowing them to be located.

All 87 private lights have valid GPS coordinates recorded.

Two of the lights with blank ICP numbers have valid GPS coordinates recorded, and the other two have roads, pole location numbers and pole numbers recorded allowing them 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 light type and wattage capacity,
- wattage capacities include any ballast or gear wattage, and
- each item of load has a light type, light wattage, and gear wattage recorded.

Audit commentary

The database contains fields for the lamp make and model, lamp wattage, and gear wattage.

Two items of load (pole IDs CX0435 and DX0328) had a blank lamp make, lamp model, lamp wattage and gear wattage, resulting in under submission of 44W or 187.9 kWh p.a. The installed light details were added to RAMM during the audit.

ICP Group	Location/RP	Pole Number	Light installed	Address
0016099004EL9CA	953	CX0435	17W LED	73 UNION ST, FOXTON
0016099004EL9CA	195	DX0328	27W LED	18 PARSONS AVE, LEVIN

No invalid zero lamp or gear wattages were identified, and the accuracy of the recorded wattages is discussed in **section 3.1**.

Audit outcome

Non-compliant

Non-compliance	Description	
Audit Ref: 2.4 With: Clause 11(2)(c) and (d) of Schedule 15.3 From: 21-Sep-22 To: 21-Sep-22	Two items of load (pole IDs CX0435 and DX0328) had a blank lamp make, lamp model, lamp wattage and gear wattage. The missing details were added during the audit. Potential impact: Low Actual impact: Low Audit history: None Controls: Strong Breach risk rating: 1	
Audit risk rating	Rationale for audit risk rating	
Low	The controls are strong because almost all items of load had lamp information recorded and RAMM was updated during the audit. The risk rating is assessed to be low because two items of load are affected, resulting in under submission of 44W or 187.9 kWh p.a.	
Actions taken to resolve the issue	Completion date	Remedial action status
Missing details were added during the audit	10.03.2023	Identified
Preventative actions taken to ensure no further issues will occur	Completion date	
HDC to look into making this field mandatory	10.03.2023	

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

Code reference

Clause 11(2A) of Schedule 15.3

Code related audit information

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

Audit observation

The field audit was completed of a statistical sample of 250 items of load on 4 October 2022. The sample was selected from four strata as follows:

1. road names A-E,
2. road names F-M,
3. road names N-R, and
4. road names S-Z.

Audit commentary

The field audit discrepancies in the table below were provided to HDC, who confirmed the findings and updated RAMM.

Street	Field count	Database count	Light count difference	Wattage recorded incorrectly	Comments
Road name A-E					
Derby St, Levin	5	4	+1	1	One unknown LED (estimated 17W) is missing from the database. Unknown LED (estimated 17W) at no. 10 is recorded in the database as 70w HPS (SON).
Donnelly Park Rd, Levin	9	9	-	9	The seven L27 lights are recorded in the database as 70w HPS (SON).
Road name F-M					
Mark Perreau Pl, Foxton	4	3	+1	-	One L22 (pole CX0153) outside no 4 is missing from the database.
Road name N-R					
Rimu St, Levin	9	9	-	1	One L42 (pole ID DX0213 opposite Nikau St) is recorded in the database as L22.
Tiro Rd, Levin	26	26	-	1	One L27 (pole ID EX0127 outside no 114) is recorded in the database as L22.
Road name S-Z					
Wilton St, Levin	7	7	-	2	Two L27s (pole ID GX0227 outside no 36A, and pole ID GX0228 outside no 30) are recorded in the database as L22.
Total	252	250	+2	14	

Two lights were located in the field which were not recorded in the database: one at Mark Perreau Pl Foxton and one at Derby St Levin. Database accuracy is discussed in **section 3.1**.

Audit outcome

Non-compliant

Non-compliance	Description
<p>Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3</p> <p>From: 04-Oct-22 To: 04-Oct-22</p>	<p>One L22 (pole CX0153) outside 4 Mark Perreau Pl, Foxton is missing from the database.</p> <p>One unknown LED (estimated 17W) is missing from the database at Derby St, Levin.</p> <p>Potential impact: Low Actual impact: Low Audit history: None Controls: Strong Breach risk rating: 1</p>

Audit risk rating	Rationale for audit risk rating		
Low	<p>Controls are rated as strong because the process is sufficient to ensure that most items of load are recorded in the database.</p> <p>The audit risk rating is assessed to be low because two lamps with an estimated total wattage of 39 W (or 167 kWh per annum) were missing. RAMM was corrected following the field audit.</p>		
Actions taken to resolve the issue		Completion date	Remedial action status
HDC confirmed missing details have been added to RAMM		10.03.2023	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	

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

Code reference

Clause 11(3) of Schedule 15.3

Code related audit information

The 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 change management process and the compliance of the database reporting provided to Contact is detailed in **sections 3.1** and **3.2**.

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 database has a complete audit trail.

Audit outcome

Compliant

3. ACCURACY OF DUML DATABASE

3.1. Database accuracy (Clause 15.2 and 15.37B(b))

Code reference

Clause 15.2 and 15.37B(b)

Code related audit information

Audit must verify that the information recorded in the retailer's DUML database is complete and accurate.

Audit observation

Contact's submissions are based on a monthly extract from the RAMM database. A RAMM database extract was provided in September 2022, 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	Horowhenua District Council streetlights
Strata	The database contains the HDC items of load DUML in the Horowhenua region. The processes for the management of all HDC items of load are the same, but I decided to place the items of load into four strata: <ol style="list-style-type: none"> 1. Road names A-E, 2. Road names F-M, 3. Road names N-R, and 4. Road names S-Z.
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 32 sub-units.
Total items of load	250 items of load were checked, making up 7.7% of the database load.

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

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

Audit commentary

Field audit findings

A field audit was conducted of a statistical sample of 250 items of load on 4 October 2022. 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	92.2	Wattage from survey is lower than the database wattage by 7.8%
R _L	84.4	With a 95% level of confidence, it can be concluded that the error could be between -15.6% and +0.2%
R _H	100.2	

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 variability of the sample results across the strata means that the true wattage (installed in the field) could be between 15.6% lower and 0.2% higher than the wattage recorded in the DUML database. Non-compliance is recorded because the potential error is greater than 5.0%.

- In absolute terms, the installed capacity is estimated to be 6 kW lower than the database indicates.
- There is a 95% level of confidence that the installed capacity is up to 6 kW lower than the database.
- In absolute terms, total annual consumption is estimated to be 27,600 kWh than the DUML database indicates.
- There is a 95% level of confidence that the annual consumption is estimated to be between 55,300 kWh lower and 1,700 kWh higher than the database indicates.

Scenario	Description
A - Good accuracy, good precision	<p>This scenario applies if:</p> <p>(a) R_H is less than 1.05; and</p> <p>(b) R_L 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 - Poor accuracy, demonstrated with statistical significance	<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 R_L is less than 0.95 or R_H 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>
C - Poor precision	<p>This scenario applies if:</p> <p>(a) the point estimate of R is between 0.95 and 1.05</p> <p>(b) R_L is less than 0.95 and/or R_H 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>

ICP number accuracy

As discussed in **section 2.2** all items of load had valid ICP numbers recorded against them, except:

ICP group	Count of items	Total wattage	Comment
Private	87	6,877W	Private lights are not the responsibility of HDC. They are recorded in the database for completeness so that if a fault is logged for a private light the caller can be advised that the end user needs to arrange the repair. It is expected that private lights will be metered through the customer's

ICP group	Count of items	Total wattage	Comment
			installation, or the network should create standard or shared unmetered load as appropriate.
(blank)	4	88W	The missing ICP numbers were manually updated in the extract before it was sent to Contact and have now been updated in RAMM.

Light description and capacity accuracy

As discussed in **section 2.4**, two items of load (pole IDs CX0435 and DX0328) had a blank lamp make, lamp model, lamp wattage and gear wattage, resulting in under submission of 44W or 187.9 kWh p.a. The installed light details were added during the audit.

Database lamp and gear wattages were checked for alignment with the published standardised wattage table produced by the Electricity Authority or LED light specifications for lights connected to 0016099004EL9CA or with a blank ICP number. No discrepancies were identified.

Some lamp model descriptions did not contain sufficient information to confirm the correct wattage e.g., “NXT Roadway” and I confirmed during the field audit that the recorded wattage for this model was correct.

Address accuracy

As discussed in **section 2.3**, all items of load have sufficient address information recorded. During the field audit I found one light with road name Baden St and three lights with road name Derby St were located at the Levin Kiwi Holiday Park, 38 Parker Ave, Levin. RAMM automatically assigns the road name based on the nearest road centreline for the location. Because these lights are located within the holiday park, they are closer to Baden St and Derby St and compliance is confirmed.

Change management process findings

New connection, fault, maintenance, and upgrade work is completed for streetlights by Fulton Hogan. All contractors completing work on HDC’s streetlights have access to RAMM and update the database using Pocket RAMM from the field. Change dates are automatically entered by RAMM.

Where new connections are initiated by HDC installation is completed by Fulton Hogan, who populate RAMM at the time of liveness from the field using Pocket RAMM.

Where new connections are initiated by developers for new subdivisions, lights are checked and added to the database once they are vested and HDC takes responsibility for them. Each new connection application to the Network includes an “as built” plan, and a site check is performed prior to approval. If details of the lights are made available to HDC prior to being vested, they will be recorded in RAMM as private lights and the ICP number will be populated once they are connected and vested.

The HDC Parks and Property team are responsible for 116 lights located in HDC owned properties and parks. They do not always use Fulton Hogan to complete field work and are expected to notify the Roding Operations Team where light details change so that RAMM can be updated where Fulton Hogan is not involved. During the field audit, I found that all seven L27 lights at Donnelly Park were recorded in the database as 70w HPS (SON) because the database had not been updated following an upgrade arranged by the Parks and Property team. I recommend that the process to ensure Parks and Property lights are updated in RAMM is checked and confirmed.

Description	Recommendation	Audited party comment	Remedial action
Process to update Parks and Property lights in RAMM	Confirm the process to ensure that RAMM is updated promptly when lights managed by the Parks and Property team are installed or changed.	Brent at HDC has advised the Parks TL that they need to enter this data once completed if work has not been completed by Fulton Hogan	Identified

The LED upgrade is complete, and changes to database information are now rare.

There is no set schedule for outage patrols. HDC relies on the public to advise of lights which need to be maintained.

Festive lights

The database contains Christmas lighting, which is connected in late November/early December and disconnected in mid-January. These items of load have “Festive Lighting” recorded as the ICP group and are excluded from submissions when they are disconnected. HDC notifies Contact of the date of connection and disconnection in the relevant monthly reports and adds them to the correct ICP group for this period. Contact includes these lights for submissions during the period in which they are switched on.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 21-Sep-22 To: 04-Oct-22	<p>The database is not confirmed as accurate with a 95% level of confidence. There is a 95% level of confidence that the annual consumption is estimated to be between 55,300 kWh lower and 1,700 kWh higher than the database indicates.</p> <p>Two items of load (pole IDs CX0435 17W LED and DX0328 27W LED) had a blank lamp make, lamp model, lamp wattage and gear wattage in RAMM resulting in under submission of 187.9 kWh p.a.</p> <p>Four items of load do not have an ICP number recorded in RAMM totalling 88W or 375 kWh per annum. There is no impact on submission because the missing ICP numbers were populated before sending the database extracts to Contact.</p> <p>Potential impact: Low Actual impact: Low Audit history: Multiple times Controls: Moderate Breach risk rating: 4</p>		
Audit risk rating	Rationale for audit risk rating		
Medium	<p>Controls are rated as moderate, as they are sufficient to mitigate the risk most of the time but there is room for improvement.</p> <p>The impact is assessed to be medium based on the kWh difference described above.</p>		
Actions taken to resolve the issue		Completion date	Remedial action status
HDC added missing details during audit		10.03.2023	Identified

Preventative actions taken to ensure no further issues will occur	Completion date	
HDC to look into making field mandatory	10.03.2023	

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 on hours against the submitted figure to confirm accuracy.

Audit commentary

Contact reconciles this DUML load using the DST profile, and the correct profile and submission flag are recorded on the registry.

- Monthly wattage reports are provided by HDC. The database is not confirmed as accurate with a 95% level of confidence as recorded in **section 3.1**.
- On and off times are derived from data logger information.

I checked the submission data for August 2022 and found the load for 0016099004EL9CA had been correctly calculated based on the data logger and monthly extract information.

Examination of the database found:

Issue	Estimated volume information impact (annual kWh)
Two items of load (pole IDs CX0435 17W LED and DX0328 27W LED) had a blank lamp make, lamp model, lamp wattage and gear wattage in RAMM.	Under submission of 187.9 kWh p.a.
Four items of load (totalling 88W) do not have an ICP number recorded in RAMM.	No impact on submission. The missing ICP numbers were manually updated in the extract before it was sent to Contact and have now been updated in RAMM.

On 18 June 2019, the Electricity Authority issued a memo clarifying the memo of 2012 that stated that a monthly snapshot was sufficient to calculate submission from, and confirmed the code requirement to calculate the correct monthly load must:

- take into account when each item of load was physically installed or removed, and

- wash up volumes must take into account where historical corrections have been made to the DUML load and volumes.

The current monthly report is provided as a snapshot. When a wattage is changed in the database due to a physical change or a correction, only the record present at the time the report is run is recorded in the extract, not the historical information showing dates of changes. HDC provides the details of any wattage changes including the change date to Contact with the monthly extract. Contact uses this information to calculate the correct load across the month where changes have occurred. Contact and HDC confirmed that changes are rare now that the LED upgrade is complete. Contact completes revision submissions where corrections are required.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: 21-Sep-22 To: 04-Oct-22	<p>The database is not confirmed as accurate with a 95% level of confidence. There is a 95% level of confidence that the annual consumption is estimated to be between 55,300 kWh lower and 1,700 kWh higher than the database indicates.</p> <p>Two items of load (pole IDs CX0435 17W LED and DX0328 27W LED) had a blank lamp make, lamp model, lamp wattage and gear wattage in RAMM resulting in under submission of 187.9 kWh p.a.</p> <p>Four items of load do not have an ICP number recorded in RAMM totalling 88W or 375 kWh per annum. There is no impact on submission because the missing ICP numbers were populated before sending the database extracts to Contact.</p> <p>Potential impact: Medium Actual impact: Low Audit history: Multiple times Controls: Moderate Breach risk rating: 4</p>		
Audit risk rating	Rationale for audit risk rating		
Medium	Controls are rated as moderate, as they are sufficient to mitigate the risk most of the time but there is room for improvement. The impact is assessed to be low, based on the low number of changes which occur in the database and the wattage differences identified.		
Actions taken to resolve the issue		Completion date	Remedial action status
HDC added missing details during audit		10.03.2023	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
HDC to look into making this field mandatory		10.03.2023	

CONCLUSION

Contact reconciles the DUML load as NHH using the DST profile, with wattages derived from the most recent database extract provided by HDC and on and off times derived from data logger information.

A field audit was conducted of a statistical sample of 250 items of load and results were analysed using the “database auditing tool”. I found that the database had poor accuracy, demonstrated with statistical significance. There is a 95% level of confidence that the annual consumption is estimated to be between 55,300 kWh lower and 1,700 kWh higher than the database indicates. The exceptions identified during the field audit were provided to HDC and updated in RAMM during the audit.

Analysis of the whole database found that lamp and gear wattages were consistent with expected values for the lamp models listed, and a very small number of lights had missing lamp model, wattage and/or ICP information. The missing information was populated in RAMM during the audit.

The future risk rating of 15 indicates that the next audit be completed in 12 months. I have taken this into consideration along with Contact’s comments which indicate that all of the discrepancies identified have been resolved, and recommend that the next audit is completed in 15 months on 18 June 2024.

PARTICIPANT RESPONSE

Horowhenua DC have been quick to add missing information such as blank lamp makes and models into their database and are looking at how these fields can be made mandatory to avoid this being a problem in future audits. They have also worked with Parks & Property to ensure any lights managed by this team are entered into RAMM if Fulton Hogan are not involved so we’re not anticipating this being an issue in the future. Horowhenua DC are aware of the importance of keeping their database up to date and correct and will continue to work to achieve the best accuracy as possible.