ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

NELSON CITY COUNCIL AND GENESIS ENERGY LIMITED

Prepared by: Rebecca Elliot

Date audit commenced: 19 January 2021

Date audit report completed: 26 February 2021

Audit report due date: 26 February 2021

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EXECUTIVE SUMMARY

This audit of the **Nelson City Council (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 RAMM database used for submission is managed by NCC. New connection, fault, and maintenance work is completed by Powertech Nelson New Zealand Limited (Powertech). Powertech record changes to the database on paper, which are then entered into a spreadsheet and updated in RAMM by Powertech's Electrical Contracts Manager.

173 lamps are recorded with the owner NZTA in the Nelson CC database. When the NCC database was with Trustpower, these lights were being excluded from submission. To correct this Nelson Electricity created an ICP for the 112 lamps on the Nelson Electricity network. These are recorded in the Nelson NZTA database and are reconciled against ICP 0000202024CT59F which is traded by Trustpower. Since the NCC database has switched to Genesis in February 2020, all of the lights in the database are being submitted as the NCC ICP has been recorded against all the items of load. Therefore, the 112 lights are being submitted twice by two different traders. This will be resulting in an estimated over submission of 85,997 kWh per annum. I recommend that Genesis liaise with Trustpower to resolve this.

Database accuracy is described as follows:

Result	Percentage	Comments
The point estimate of R	97.9	Wattage from survey is lower than the database wattage by 2.1%
R_L	92.2	With a 95% level of confidence, it can be concluded that the error could be between -7.8% and 1.0%
R_H	101.0	

The variability of the sample results across the strata means that the true wattage (installed in the field) could be between 7.8% lower and 1.0% 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 between 23 kW lower to 3 kW higher than the database.
- In absolute terms, total annual consumption is estimated to be 26,700 kWh lower than the DUML database indicates.
- There is a 95% level of confidence that the annual consumption is between 98,200 kWh p.a. lower to 12,700 kWh p.a. higher than the database indicates.

The audit found five non-compliances and makes two recommendations. The future risk rating of 22 indicates that the next audit be completed in three months. I have considered this in conjunction with Genesis' responses and recommend that the next audit period 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	Estimated over submission of 4,699 kWh for ICP 0000200190CTC63 for the month of December 2020 due to no monthly report being received. The database accuracy is assessed to be 97.9% of the database for the sample checked indicating a potential over submission of approximately 26,700 kWh per annum. Nine items of load have zero wattage with an estimated annual under submission of 2,690 kWh. 52 items of load with the incorrect ballast applied resulting in an estimated annual under submission of 3,357 kWh. 112 lights are being submitted twice resulting in an estimated over submission of 85,997 kWh per annum. Submission is based on a snapshot and does not consider historic adjustments.	Moderate	High	6	Identified
ICP identifier and items of load	2.2	Clause 11(2)(a) and (aa) of Schedule 15.3	One item of load does not have an ICP recorded.	Moderate	Low	2	Identified
Description and capacity of load	2.4	11(2)(c) and (d) of Schedule 15.3	Nine items of load have zero wattage with an estimated annual under submission of 2,690 kWh.	Moderate	Low	2	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)	The database accuracy is assessed to be 97.9% of the database for the sample checked indicating a potential over submission of approximately 26,700 kWh per annum. Nine items of load have zero wattage with an estimated annual under submission of 2,690 kWh. 52 items of load with the incorrect ballast applied resulting in an estimated annual under submission of 3,357 kWh. 112 lights are being submitted twice resulting in an estimated over submission of 85,997 kWh per annum.	Moderate	High	6	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)	Estimated over submission of 4,699 kWh for ICP 0000200190CTC63 for the month of December 2020 due to no monthly report being received. The database accuracy is assessed to be 97.9% of the database for the sample checked indicating a potential over submission of approximately 26,700 kWh per annum. Nine items of load have zero wattage with an estimated annual under submission of 2,690 kWh. 52 items of load with the incorrect ballast applied resulting in an estimated annual under submission of 3,357 kWh. 112 lights are being submitted twice resulting in an estimated over submission of 85,997 kWh per annum. Submission is based on a snapshot and does not consider historic adjustments.	Moderate	High	6	Identified
Future Risk Rating						**22**	

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
ICP identifier	3.1	Populate the ICP field in RAMM with the relevant ICP for all unmetered and metered items of load.
Liaise with Trustpower, Nelson Electricity and NZTA to identify the correct ICP for the NZTA lights.	3.1	173 lamps identified as owner NZTA in NCC database. 112 lamps are associated to ICP 0000202024CT59F. Confirm ICP for remaining 61 lamps in NCC database.

ISSUES

Subject	Section	Description	Issue
		Nil	

1. ADMINISTRATIVE

1.1. Exemptions from Obligations to Comply with Code

Code reference

Section 11 of Electricity Industry Act 2010.

Code related audit information

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

Audit observation

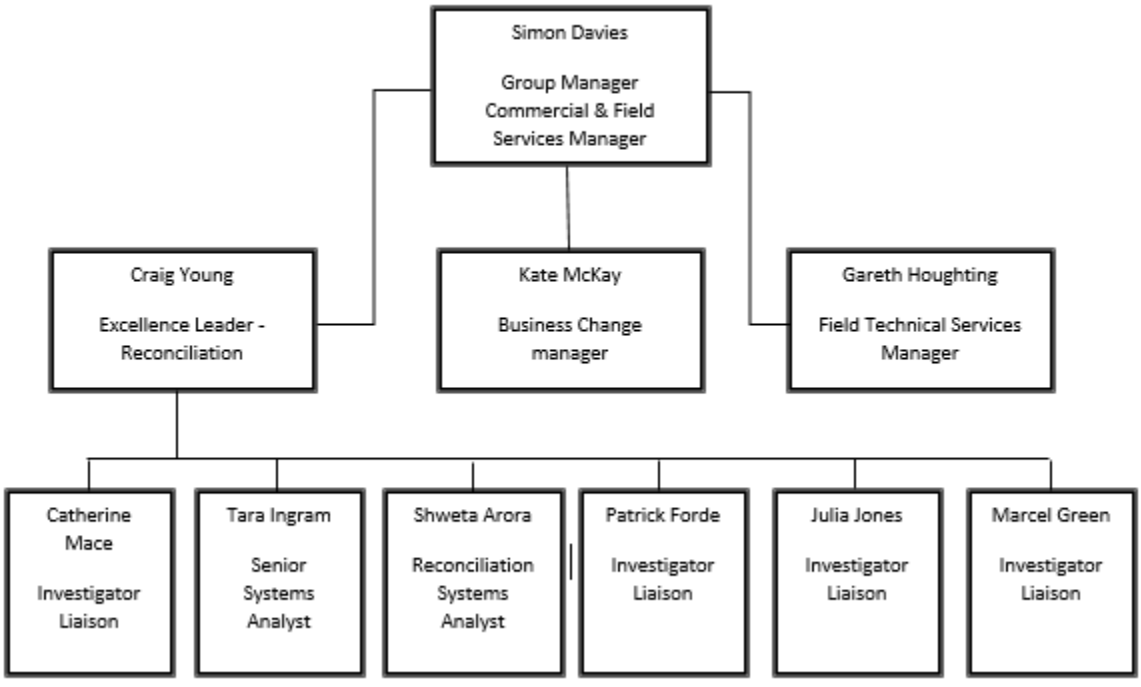
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

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	Company	Role
Rebecca Elliot	Veritek Limited	Lead Auditor
Claire Stanley	Veritek Limited	Supporting Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Craig Young	Excellence Leader - Reconciliation	Genesis Energy
Julia Jones	Technical Specialist - Reconciliations Team	Genesis Energy
Roy Price	Electrical Contracts Manager	Powertech Nelson New Zealand Limited
Gillian Dancey	Contract Supervisor - Roading	Nelson City Council

1.4. Hardware and Software

The SQL database used for the management of DUML is remotely hosted by RAMM Software Ltd. The database is commonly known as "RAMM" which stands for "Roading Asset and Maintenance Management".

Database back-up is in accordance with standard industry procedures. Access to the database is secure by way of password protection.

Systems used by the trader to calculate submissions were 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)
0000090001NTBEF	NCC STREETLIGHTING STOKE	STK0331	STL	3,025	156,600
0000200190CTC63	NELSON STREETLIGHTS	STK0331	STL	2,393	137,165
			Total	**5,418**	**293,765**

I note in **section 3.1** that there are 508 items of metered load recorded with the unmetered ICP.

These have been excluded from the totals above.

1.7. Authorisation Received

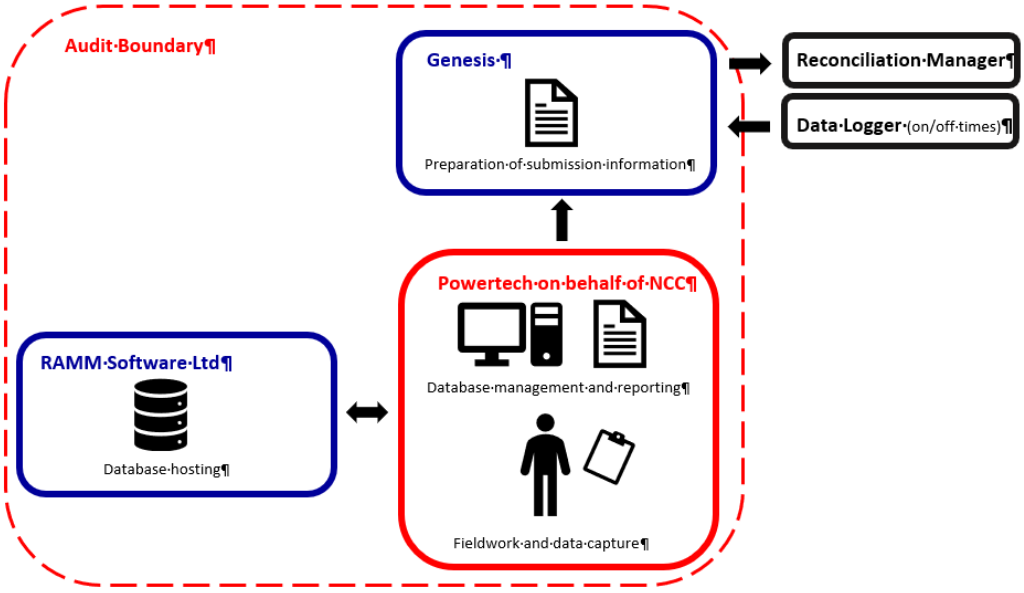
All information was provided directly by Genesis, NCC, and Powertech.

1.8. Scope of Audit

The RAMM database used for submission is managed by NCC. New connection, fault, and maintenance work is completed by Powertech Nelson New Zealand Limited (Powertech). Powertech record changes to the database on paper, which are then entered into a spreadsheet and updated in RAMM by Powertech's Electrical Contracts Manager.

Powertech provide Genesis a monthly report of changes to the database, and a full report from the database every three months.

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

The field audit was undertaken of 281 items of load.

1.9. Summary of previous audit

The previous audit was completed in March 2020 by Rebecca Elliot of Veritek Limited for Genesis Energy Ltd. Five non-compliances were identified, and two recommendations were made. The statuses of the non-compliances and recommendations are described below.

Table of Non-compliances

Subject	Section	Clause	Non-compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	Under submission of 9,408 kWh for ICP 0000200190CTC63 due to lack of database information being provided to Genesis. The database accuracy is assessed to be 95.3% of the database for the sample checked indicating a potential over submission of approximately 61,400 kWh per annum. 3 items of load have zero wattage with an estimated annual under submission of 1,064 kWh. 31 items of load with the incorrect ballast applied resulting in an estimated minor annual under submission of 393 kWh. Submission is based on a snapshot and does not consider historic adjustments.	Cleared Still existing Still existing Still existing Still existing
ICP identifier and items of load	2.4	11(2)(c) and (d) of Schedule 15.3	Three items of load have unknown or blank lamp model, and zero wattage.	Still existing
Description and capacity of load	2.5	11(2A) of Schedule 15.3	Nine additional items of load found in the field.	Cleared
Database accuracy	3.1	15.2 and 15.37B(b)	The database accuracy is assessed to be 95.3% of the database for the sample checked indicating a potential over submission of approximately 61,400 kWh per annum. 3 items of load have zero wattage with an estimated annual under submission of 1,064 kWh. 31 items of load with the incorrect ballast applied resulting in an estimated minor annual under submission of 393 kWh.	Still existing Still existing Still existing

Subject	Section	Clause	Non-compliance	Status
Volume information accuracy	3.2	15.2 and 15.37B(c)	Under submission of 9,408 kWh for ICP 0000200190CTC63 due to lack of database information being provided to Genesis.	Cleared
			The database accuracy is assessed to be 95.3% of the database for the sample checked indicating a potential over submission of approximately 61,400 kWh per annum.	Still existing
			3 items of load have zero wattage with an estimated annual under submission of 1,064 kWh.	Still existing
			31 items of load with the incorrect ballast applied resulting in an estimated minor annual under submission of 393 kWh.	Still existing
			Submission is based on a snapshot and does not consider historic adjustments.	Still existing

Table of Recommendations

Subject	Section	Recommendation	
ICP identifier	2.2	Populate the ICP field in RAMM with the relevant ICP for all unmetered items of load.	Still existing recorded under section 3.1 in this audit
Database Accuracy	3.1	Genesis liaises with NCC to review the management of the NZTA, and private lights recorded in the NCC database.	Still existing

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 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

Genesis reconciles this DUML load using the CST profile. Genesis usually receives a monthly report from the contractor and the kW value is derived from this. The on and off times were derived from data logger information.

I checked the submission data for December 2020 and found a variance for ICP 0000200190CTC63:

ICPs	Fittings number from Dec 2020 submission	Fittings number from database extract	Differences	kWh value submitted	Calculated kWh value from database	kWh Differences
0000200190CTC63	2,488	2,393	95	43,161	38,462	4,699

Genesis did not receive a report for December 2020 so had to use the November 2020 data. It appears that lights have been removed from the database between November and December 2020 hence the difference in volumes submitted. Genesis is working with the council to get a monthly report that will track changes at a daily level, and they will then revise the volumes from December 2020 forward. The incorrect volumes submitted for December 2020 is recorded as non-compliance below.

Some database inaccuracies have led to inaccurate volume information as detailed in **sections 2.4** and **3.1**. Specifically:

- the database accuracy is assessed to be 97.9% of the database for the sample checked indicating a potential over submission of approximately 26,700 kWh per annum,
- nine items of load with missing lamp wattage resulting in an estimated under submission of 2,690 kWh per annum,
- 52 items of load with the incorrect ballast applied resulting in an estimated annual under submission of 3,357 kWh, and
- 112 lights are being submitted twice by two different traders which will be resulting in an estimated over submission of 85,997 kWh per annum.

On 18 June 2019, the Electricity Authority issued a memo confirming that 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. As detailed above, Genesis are working with the council to get a monthly report that tracks changes at a daily level but currently only a snap shot is being used and this practice is non-compliant.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 01-Mar-20 To: 19-Jan-21	Estimated over submission of 4,699 kWh for ICP 0000200190CTC63 for the month of December 2020 due to no monthly report being received. The database accuracy is assessed to be 97.9% of the database for the sample checked indicating a potential over submission of approximately 26,700 kWh per annum. Nine items of load have zero wattage with an estimated annual under submission of 2,690 kWh. 52 items of load with the incorrect ballast applied resulting in an estimated annual under submission of 3,357 kWh. 112 lights are being submitted twice resulting in an estimated over submission of 85,997 kWh per annum. Submission is based on a snapshot and does not consider historic adjustments. Potential impact: High Actual impact: High Audit history: Twice previously Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated overall as moderate as Genesis have robust controls in place in relation to submission, but the assessment of the database indicates that the controls in place to provide an accurate database are weak for the NZTA and private lights. The impact is assessed to be high due to the level of submission inaccuracy.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis Energy are in the process of confirming the alleged over estimation for the 112 NZTA assets, however also believe this to be the case and has inherited the issue from the previous trader. Genesis will be requesting the NZTA assets ICP be corrected. Genesis has been working with the council to define the monthly reporting requirements and provide exception reporting back to the council if any.	01/06/2021	Identified

Preventative actions taken to ensure no further issues will occur	Completion date	
Genesis has requested the council to discuss better report to the trader to ensure all assets are provided along with changes. Genesis will continue to review these monthly reports	01/06/2021	

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 for each item of load.

Audit commentary

One item of load does not have an ICP recorded. The accuracy of the ICPs 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: 01-Mar-20 To: 19-Jan-21	One item of load does not have an ICP recorded. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2		
Audit risk rating	**Rationale for audit risk rating**		
Low	The controls are recorded as moderate because they mitigate risk most of the time but there is room for improvement. The impact on settlement and participants is minor; therefore, the audit risk rating is low.		
Actions taken to resolve the issue		**Completion date**	**Remedial action status**
Genesis requested the asset details be updated.		01/06/2021	Identified
Preventative actions taken to ensure no further issues will occur		**Completion date**	
Genesis has requested the council to discuss better report to the trader to ensure all assets are provided along with changes. Genesis will continue to review these monthly reports		01/06/2021	

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 nearest house address is recorded for all items of load and all but 72 had GPS coordinates. The street address was sufficient to locate those.

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 has all details complete with the exception of the nine items of load recorded which have the wattage recorded as zero or blank. Six of these have no lamp make, model description or lamp wattage. Four of these have Gear Wattage recorded in the database.

The records are shown in the table below.

Location	House Address	Make	Model	Lamp Wattage	Gear Wattage
304	JENNER ROAD	Philips	Unknown	0	10
575	MOTUEKA STREET (OMAHU WAY - 1ST IN ROW)	Philips	Unknown	0	
551	MOTUEKA STREET (F3 OMAHU WAY)	Philips	Unknown	0	
789	BRIDGE STREET	Unknown	Unknown	Unknown	
	BROADFIELD PLACE	Unknown	Unknown	Unknown	0
	MAJESTIC WAY	Unknown	Unknown	Unknown	
	NEWPORT WAY	Unknown	Unknown	Unknown	13
942	TOSSWILL ROAD	Unknown	Unknown	Unknown	13
645	VANGUARD STREET	Unknown	Unknown	Unknown	11

The accuracy of the lamp wattages and ballasts 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: 01-Mar-20 To: 19-Jan-21	Nine items of load have zero wattage with an estimated annual under submission of 2,690 kWh. Potential impact: Low Actual impact: Low Audit history: Multiple times Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are moderate because they mitigate risk to an acceptable level. The impact is assessed to be low, based on the unknown wattage details above.

Actions taken to resolve the issue	Completion date	Remedial action status
Request asset details to be updated	01/06/2021	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Continue to work with NCC and Contactor for data provisions enabling exception reporting.	01/06/2021	

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 281 items of load. The total population was divided into four strata:

- A – G,
- H – O,
- P – S, and
- T – Z.

Audit commentary

The field audit discrepancies are detailed in the table below.

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
BOYSENBERRY GROVE	4	4		1	1 x incorrect wattage recorded as 38W LED in database but 24W LED found in the field
KEBAL PLACE	2	2		2	2 x incorrect wattage recorded as 70W HPS in the database but 2 x 24W LED found in the field
LILYVALE CRESCENT	8	8		1	1 x incorrect wattage recorded as 52W LED but 76W LED found in the field
NEWPORT WAY	1	1		1	1 x incorrect wattage recorded as 0 in database but 1 x 70W HPS found in the field.
PALM AVENUE	7	6	-1		2 X 24w LED recorded in the database with the same coordinates. Only 1 x 24W LED found in the field.
RUTH TAYLOR AVENUE	4	4		3	3 x incorrect wattage recorded as 70W HPS in the database but 3 x 24W LED found in the field.
WALTERS BLUFF	10	10		1	1x incorrect wattage recorded as 24W LED in the database but 27W LED found in the field
Total discrepancies found			**-1**	**9**	

I found no additional lights in the field.

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

Audit outcome

Compliant

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.

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

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 contains a complete audit trail. Reporting is provided to Genesis from the RAMM database.

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	NCC region
Strata	The database contains items of load in Nelson area. The processes for the management of all NCC items of load are the same. The total population was divided into four strata: • A - G • H - O • P – S • T – 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 62 sub-units.
Total items of load	281 items of load were checked.

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

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

Audit commentary

A field audit was conducted of a statistical sample of 281 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	97.9	Wattage from survey is lower than the database wattage by 2.1%
R_L	92.2	With a 95% level of confidence, it can be concluded that the error could be between -7.8% and 1.0%
R_H	101.0	

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

The conclusion from Scenario C is that the variability of the sample results across the strata means that the true wattage (installed in the field) could be between 7.8% lower and 1.0% 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 between 23 kW lower to 3 kW higher than the database.

In absolute terms, total annual consumption is estimated to be 26,700 kWh lower than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 98,200 kWh p.a. lower to 12,700 kWh p.a. higher than the database indicates.

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

Lamp description and capacity accuracy

As discussed in **section 2.4**, the database has all details complete with the exception of nine unmetered items of load that have the wattage recorded as zero or unknown. Six of these have no lamp make or model description, three have no model description. Four of these have Gear Wattage recorded in the database. The records are shown in the table below. If it is assumed that these lights are 70W HPS then under submission of 2,690 kWh p.a. is estimated.

Location	House Address	Make	Model	Lamp Wattage	Gear Wattage
304	JENNER ROAD	Philips	Unknown	0	10
575	MOTUEKA STREET (OMAHU WAY - 1ST IN ROW) (Private)	Philips	Unknown	0	
551	MOTUEKA STREET (F3 OMAHU WAY) (Private)	Philips	Unknown	0	
789	BRIDGE STREET	Unknown	Unknown	Unknown	
	BROADFIELD PLACE (Private)	Unknown	Unknown	Unknown	0
	MAJESTIC WAY (Private)	Unknown	Unknown	Unknown	
	NEWPORT WAY (Private)	Unknown	Unknown	Unknown	13
942	TOSSWILL ROAD	Unknown	Unknown	Unknown	13
645	VANGUARD STREET	Unknown	Unknown	Unknown	11

Wattages for all items of load were checked against the published standardised wattage tables produced by the Electricity Authority, and the manufacturer's specifications. In relation to the LED lights, I found there were no wattages that could not be supported by at least one specification sheet. I found 52 lights with incorrect gear wattage applied resulting in an estimated annual under submission of 3,357 kWh.

Location accuracy

The field audit did not identify any location discrepancies.

ICP number and owner accuracy

The database has the ICP field populated for all items of load regardless of whether they are metered or not. 508 items of metered load have the unmetered ICP recorded against them. The metered items of load have zero wattage recorded so there is no impact on reconciliation.

I repeat the recommendation from the last audit, that the ICP field is populated with the relevant ICP in the database to ensure that only the unmetered items have the unmetered load ICPs recorded against them.

Recommendation	Description	Audited party comment	Remedial action
ICP identifier	Populate the ICP field in RAMM with the relevant ICP for all unmetered and metered items of load.	Genesis continues to work with the council to improve the database asset information	Investigating

173 lamps are recorded with the owner NZTA in the Nelson CC database. When the database was with Trustpower, these lights were being excluded from submission. To correct this Nelson Electricity created an ICP for the 112 lamps on the Nelson Electricity network. These are recorded in the Nelson NZTA database and are reconciled against ICP 0000202024CT59F which is traded by Trustpower. Since the NCC database has switched to Genesis all of the lights in the database are being submitted as the NCC ICP has been recorded against all items of load. Therefore, the 112 lights are being submitted twice by two different traders. This will be resulting in an estimated over submission of 85,997 kWh per annum. This is recorded as non-compliance.

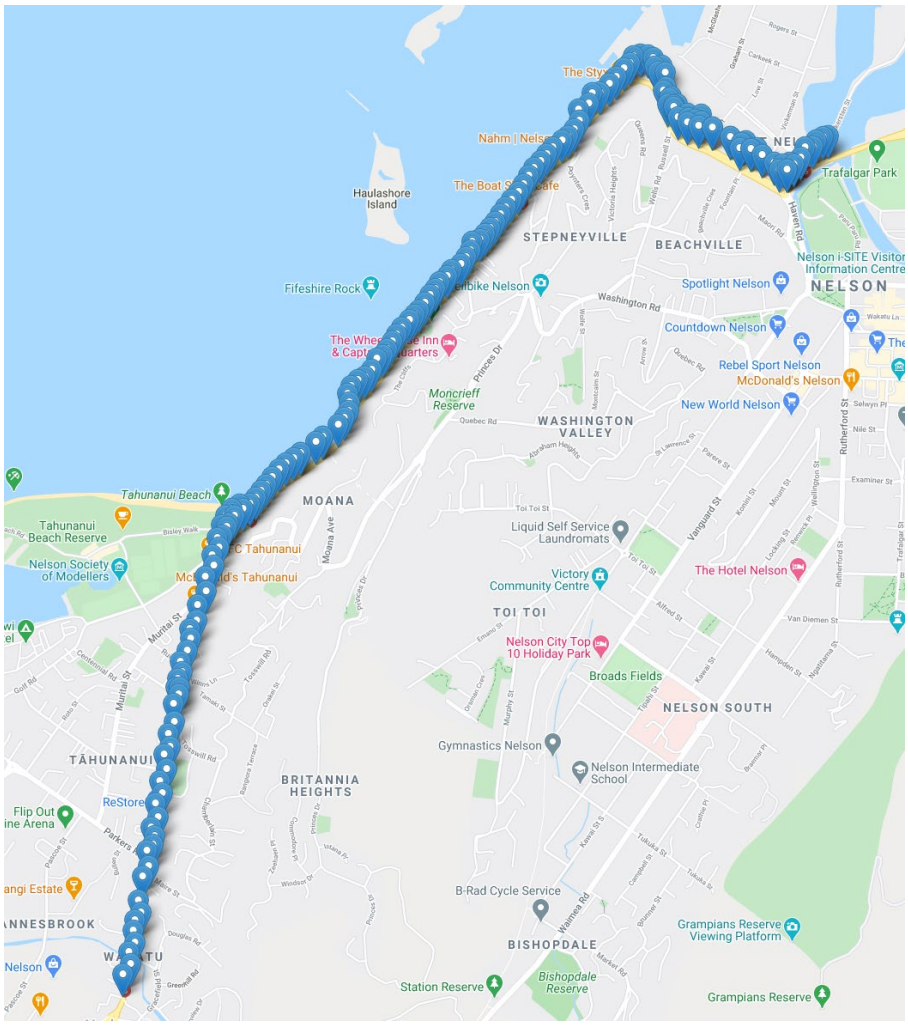
The lamps that belong to ICP 0000202024CT59F should either have the correct ICP allocated or be removed from the Nelson CC database.

There are an additional 61 lights on the Network Tasman network recorded in the NCC database that are owned by NZTA. These should be investigated to confirm the correct ICP for them to be reconciled to. If all of the NZTA lights are to be reconciled by NZTA and not NCC then an ICP will need to be created to account for the NZTA lights on Network Tasman. I recommend that Genesis liaise with Trustpower to resolve this.

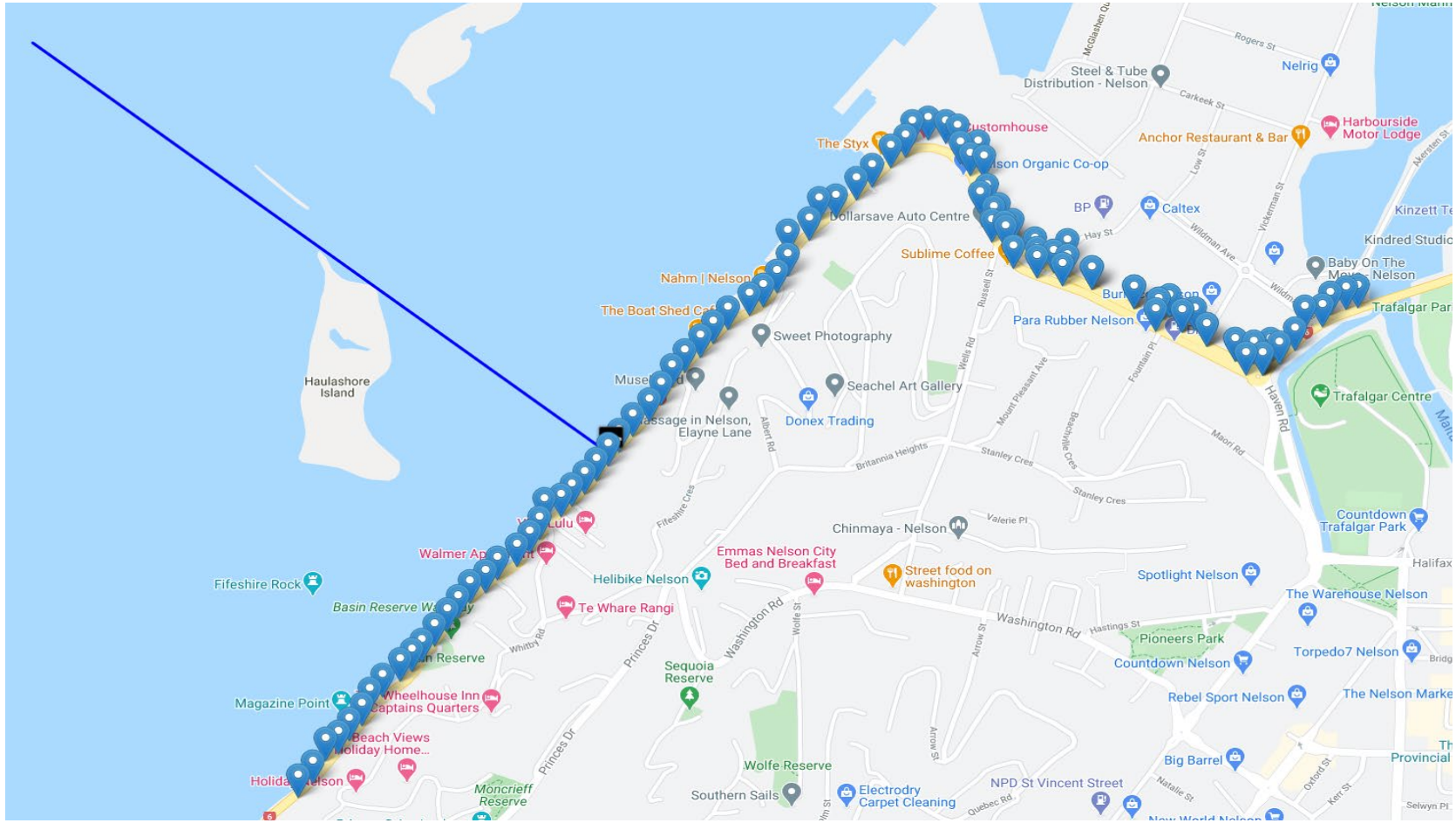
Recommendation	Description	Audited party comment	Remedial action
Liaise with Trustpower and NZTA to identify the correct ICP for the NZTA lights.	173 lamps identified as owner NZTA in NCC database. 112 lamps are associated to ICP 0000202024CT59F. Confirm ICP for remaining 61 lamps in NCC database.	Genesis has reviewed the data and believe that this is correct. Genesis will revise the settlements and request the ICP assigned to NZTA be updated. Genesis has inherited the issue created by the previous trader and was none the wiser.	Identified

I have mapped both sets of lights below:

NZTA owned lights in the NCC RAMM database:



Nelson NZTA ICP 0000202024CT59F (Trustpower):



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There are 160 private lights recorded in the database. These are recorded against the two ICPs in the database, NCC pays for the consumption and on-charges this to the residents annually.

Change management process findings

New connection, fault and maintenance work is completed by Powertech. Powertech record changes to the database on paper, which are then entered into a spreadsheet and updated in RAMM by Powertech's Electrical Contracts Manager. The database is usually updated within two business days of work being completed. If the road is yet to be loaded in RAMM the lights are pegged to the nearest available load until such time that the road is created in RAMM. The lights are then reassigned to the new road. The light install date is used as the date of physical change.

For new connections, Powertech receives a request from NCC, arranges connection and loads the streetlight into RAMM including light type and wattage information, location, GPS coordinates and the date livened.

For new subdivisions:

- if Powertech is the contractor, the new connection process above is followed, and
- if another contractor is used, the developer arranges connection with the network and provides "as built" plans to NCC, then NCC passes the details to Powertech, who check the new lights and update the database.

There can be a delay in NCC being advised of new connections where Powertech is not the contractor. It is estimated that Powertech is the contractor for over half of recent new subdivisions. The light install date is used as the date of physical change, which provides an accurate start date, but the current reporting process is based on a snapshot and this practice is non-compliant.

Christmas and festive lights are used by NCC. These lights are metered and excluded from the scope of this audit.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 01-Mar-20 To: 19-Jan-21	The database accuracy is assessed to be 97.9% of the database for the sample checked indicating a potential over submission of approximately 26,700 kWh per annum. Nine items of load have zero wattage with an estimated annual under submission of 2,690 kWh. 52 items of load with the incorrect ballast applied resulting in an estimated annual under submission of 3,357 kWh. 112 lights are being submitted twice resulting in an estimated over submission of 85,997 kWh per annum. Potential impact: High Actual impact: High Audit history: Three times previously Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as moderate overall, because they are sufficient to ensure that database wattage is accurate for the bulk of lights which belong to NCC council lights but the controls for the accuracy of the NZTA and private lights are weak. The impact is assessed to be high, because over submission may be occurring of approx. 27,700 kWh per annum based on the database accuracy.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis will be requesting the asset details be corrected to depict ownerships and correct asset details.	01/06/2021	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Genesis will request the NZTA asset ICP be updated and continue to review the data provided by the Council.	01/06/2021	

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

Genesis reconciles this DUML load using the CST profile. Genesis usually receives a monthly report from the contractor and the kW value is derived from this. The on and off times were derived from data logger information.

I checked the submission data for December 2020 and found a variance for ICP 0000200190CTC63:

ICPs	Fittings number from Dec 2020 submission	Fittings number from database extract	Differences	kWh value submitted	Calculated kWh value from database	kWh Differences
0000200190CTC63	2,488	2,393	95	43,161	38,462	4,699

Genesis did not receive a report for December 2020 so had to use the November 2020 data. It appears that lights have been removed from the database between November and December 2020 hence the difference in volumes submitted. Genesis is working with the council to get a monthly report that will track changes at a daily level, and they will then revise the volumes from December 2020 forward. The incorrect volumes submitted for December 2020 is recorded as non-compliance below.

Some database inaccuracies have led to inaccurate volume information as detailed in **sections 2.4** and **3.1**. Specifically:

- the database accuracy is assessed to be 97.9% of the database for the sample checked indicating a potential over submission of approximately 26,700 kWh per annum,
- nine items of load with missing lamp wattage resulting in an estimated under submission of 2,690 kWh per annum,
- 52 items of load with the incorrect ballast applied resulting in an estimated annual under submission of 3,357 kWh, and
- 112 lights are being submitted twice by two different traders which will be resulting in an estimated over submission of 85,997 kWh per annum.

On 18 June 2019, the Electricity Authority issued a memo confirming that 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 and this practice is non-compliant. The database contains a "light install date" and a "lamp install date" but there is not a field for "livening date" for newly connected lights. 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, not the historical information showing dates of changes. Genesis completes revision submissions where corrections are required and has not yet updated their processes to be compliant with the Authority's memo.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: 01-Mar-20 To: 19-Jan-21	Estimated over submission of 4,699 kWh for ICP 0000200190CTC63 for the month of December 2020 due to no monthly report being received. The database accuracy is assessed to be 97.9% of the database for the sample checked indicating a potential over submission of approximately 26,700 kWh per annum. Nine items of load have zero wattage with an estimated annual under submission of 2,690 kWh. 52 items of load with the incorrect ballast applied resulting in an estimated annual under submission of 3,357 kWh. 112 lights are being submitted twice resulting in an estimated over submission of 85,997 kWh per annum. Submission is based on a snapshot and does not consider historic adjustments. Potential impact: High Actual impact: High Audit history: Twice previously Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated overall as moderate as Genesis have robust controls in place in relation to submission, but the assessment of the database indicates that the controls in place to provide an accurate database are weak for the NZTA and private lights. The impact is assessed to be high due to the level of submission inaccuracy.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis Energy are in the process of confirming the alleged over estimation for the 112 NZTA assets, however also believe this to be the case and has inherited the issue from the previous trader. Genesis will be requesting the NZTA assets ICP be corrected. Genesis has been working with the council to define the monthly reporting requirements and provide exception reporting back to the council if any.	01/06/2021	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Genesis has requested the council to discuss better report to the trader to ensure all assets are provided along with changes. Genesis will continue to review these monthly reports	01/06/2021	

CONCLUSION

The RAMM database used for submission is managed by NCC. New connection, fault, and maintenance work is completed by Powertech Nelson New Zealand Limited (Powertech). Powertech record changes to the database on paper, which are then entered into a spreadsheet and updated in RAMM by Powertech's Electrical Contracts Manager.

173 lamps are recorded with the owner NZTA in the Nelson CC database. When the NCC database was with Trustpower, these lights were being excluded from submission. To correct this Nelson Electricity created an ICP for the 112 lamps on the Nelson Electricity network. These are recorded in the Nelson NZTA database and are reconciled against ICP 0000202024CT59F which is traded by Trustpower. Since the NCC database has switched to Genesis, all of the lights in the database are being submitted as the NCC ICP has been recorded against all items of load. Therefore, the 112 lights are being submitted twice by two different traders. This will be resulting in an estimated over submission of 85,997 kWh per annum. I recommend that Genesis liaise with Trustpower to resolve this.

Database accuracy is described as follows:

Result	Percentage	Comments
The point estimate of R	97.9	Wattage from survey is lower than the database wattage by 2.1%
R_L	92.2	With a 95% level of confidence, it can be concluded that the error could be between -7.8% and 1.0%
R_H	101.0	

The variability of the sample results across the strata means that the true wattage (installed in the field) could be between 7.8% lower and 1.0% 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 between 23 kW lower to 3 kW higher than the database.
- In absolute terms, total annual consumption is estimated to be 26,700 kWh lower than the DUML database indicates.
- There is a 95% level of confidence that the annual consumption is between 98,200 kWh p.a. lower to 12,700 kWh p.a. higher than the database indicates.

The audit found five non-compliances and makes two recommendations. The future risk rating of 22 indicates that the next audit be completed in three months. I have considered this in conjunction with Genesis' responses and recommend that the next audit period be in nine months time.

PARTICIPANT RESPONSE

Genesis has been working with the council to establish clarity around reporting formats and frequency. The Contractor providing the information previous only supplied change data which Genesis were unable to ascertain database accuracy of the incumbent assets.

The NZTA data was onboarded along with the council assets. The NZTA assets had the council ICP held against the assets within database which was most likely not updated by the previous trader, thus Genesis were none the wiser when the account was set up. The Council has never queried the kWh being billed therefore there was no reason to question its integrity. Genesis will work with the council to have the ICP updated to reflect the NZTA's ICP, and review the data for revision purposes.