ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

WAKA KOTAHI GREATER WELLINGTON REPORT (FORMERLY NZTA PORIRUA)

FOR

GENESIS ENERGY LIMITED

Prepared by: Steve Woods, Veritek Limited

Date audit commenced: 14 March 2024

Date audit report completed: 19 June 2024

Audit report due date: 31 January 2023

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This audit of the **NZTA Greater Wellington area** 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 held by NZTA and is an amalgamation of several other databases. Regular reporting has only been provided to Genesis since August 2023.

The audit found many ICP related discrepancies affecting ICP accuracy, status and profiles, which in turn have affected submission accuracy.

The database has poor accuracy; the field audit identified discrepancies with 56% of the 494 items of load audited. Over submission is occurring by an estimated 466,500 kWh per annum. Revisions can only go back 14 months, however it's likely the inaccuracies occurred prior to that.

The only solution to getting an accurate database, is to conduct a 100% field audit, which I recommend in **section 3.1**.

Six non-compliances were identified, and two recommendations are raised. The future risk rating of 42 indicates that the next audit be completed in three months. I have considered this in conjunction with Genesis's response and I recommend the next audit is conducted in six months, which provides sufficient time to conduct a full field audit of the 2,800 items of load in the database.

The matters raised are detailed below:

AUDIT SUMMARY

NON-COMPLIANCES

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Distributed unmetered load audits	1.10	16A.26 and 17.295F	Audit not completed by the due date.	Weak	High	9	Cleared
Deriving submission information	2.1	11(1) of Schedule 15.3	The database is outside of the allowable +/-5% threshold. Over submission has occurred of 466,500 kWh per annum. 11 items of load with blank wattage. One item of load with incorrect ballast. Database reporting is a monthly snapshot and does not record historic changes. Non compliant CST profile used.	Weak	High	9	Identified
Description and capacity of load	2.4	11(4) of Schedule 15.3	68 items of load with a blank lamp model. 140 items of load with insufficient descriptions. 11 items of load with blank wattage.	Weak	Low	3	Identified
All load recorded in database	2.5	11(2A) of Schedule 15.3	Six additional lights were found in the field.	Weak	Low	3	Identified
Database accuracy	3.1	15.2 and 15.37B(b)	The database is outside of the allowable +/-5% threshold. Over submission has occurred of 466,500 kWh per annum. 11 items of load with blank wattage. 68 items of load have a blank light model description and 140 have insufficient details to identify the wattage. One item of load with incorrect ballast.	Weak	High	9	Identified

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
			Many items of load have incorrect ICPs.				
Volume information accuracy	3.2	15.2 and 15.37B(c)	The database is outside of the allowable +/-5% threshold. Over submission has occurred of 466,500 kWh per annum. 11 items of load with blank wattage. One item of load with incorrect ballast. Database reporting is a monthly snapshot and does not record historic changes. Non compliant CST profile used.	Weak	High	9	Identified
Future Risk Rating						42	

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
Database accuracy	3.1	Review the change management process to ensure that all changes are recorded in RAMM for the correct date.
Database accuracy	3.1	Conduct a 100% field audit of the database to ensure it is accurate.

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

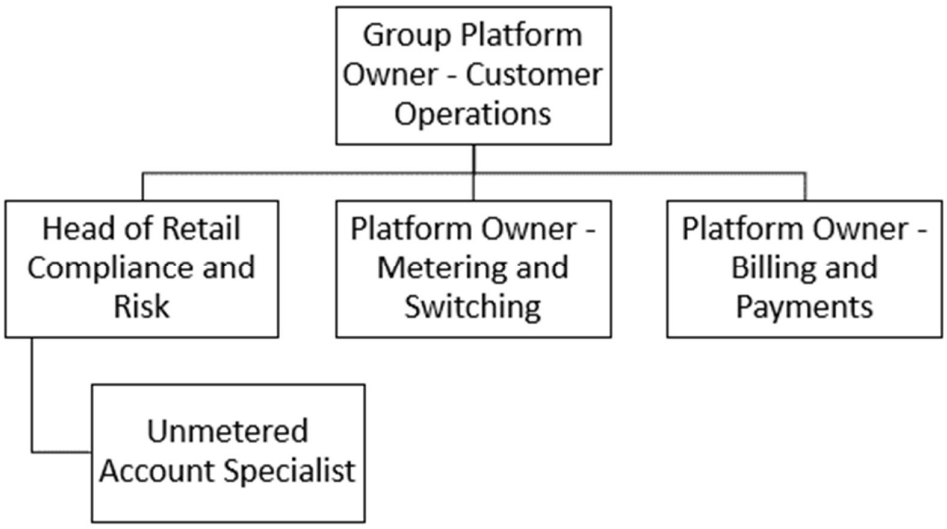
Current code exemptions were reviewed on the Electricity Authority website.

Audit commentary

There are no exemptions 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
Steve Woods	Veritek Limited	Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Alysha Majury	Unmetered Account Specialist	Genesis
Kara Atkinson	Director	NZ Streetlighting

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 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

The NZTA greater Wellington area DUML database contains the following unmetered load ICPs traded by Genesis Energy in the table below:

ICP	Description	NSP	Profile	Number of items of load	Database wattage (watts)
1001102038UN6D0	MASTER ICP NZTA STREETLIGHT TKR0331	TKR0331	CST	800	192,199
1001102039UNA95	MASTER ICP NZTA STREETLIGHT PNI0331 (INCL. SH58)	PNI0331	CST	154	37,037
1001102046UN016	MASTER ICP NZTA/NGAURANGA TO TCE TUNNEL	CPK0331	CST	27	4,023
1001102047UNC53	MASTER ICP NZTA STREETLIGHT UHT0331	UHT0330	CST	307	72,964
1001102049UNFC8	MASTER ICP NZTA PETONE-NGAURANGA MLG0331	MLG0331	CST	0	-
1001105788UNF00	PUKERUA BAY TO NGAURANGA	PNI0331	CST	0	-
0110013115EL2CA	NZTA Streetlights - PRM	PRM0331	CST	245	40,473
0110013116ELE0A	NZTA Streetlights - PRM	PRM0331	CST	426	57,966
0000172620CKC5D	MASTER ICP WAKA KOTAHI STREELIGHTS KWA0111	KWA0111	UNM	300	63,498
0000171051CK1A3	MASTER ICP WAKA KOTAHI STREELIGHTS GFD0331	GDF0331	CST	76	18,554
0000172402CKB8A	MASTER ICP WAKA KOTAHI STREELIGHTS HAY0111	HAY0111	CST	57	11,506
0000171050CKDE6	MASTER ICP WAKA KOTAHI STREELIGHTS MLG0111	MLG0111	UNM	375	37,994
0000172555CK74C	MASTER ICP WAKA KOTAHI 24HRS STREELIGHTS GFD0331	GDF0331	UNM	33	40

1.7. Authorisation Received

All information was provided directly by Genesis and NZ Streetlighting.

1.8. Scope of Audit

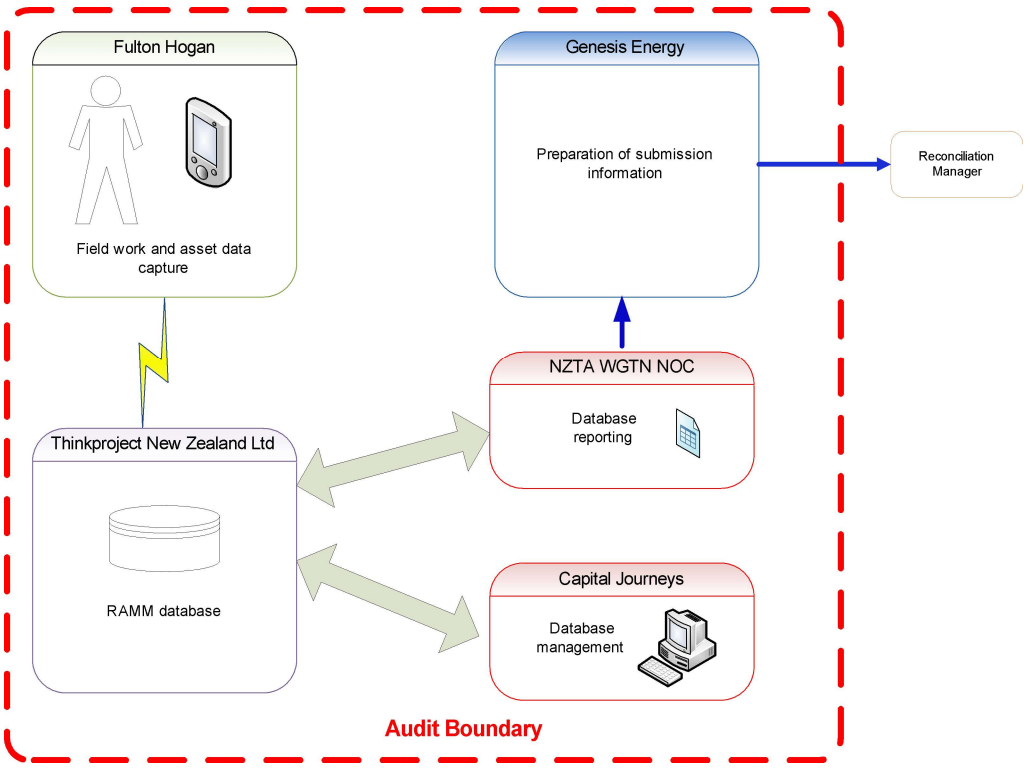
This audit of the NZTA Greater Wellington area DUML database and processes was conducted at the request of Genesis Energy Limited (Genesis) in accordance with clause 15.37B.

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 is maintained by the Capital Journeys and field work is carried out by Fulton Hogan.

Genesis reconciles the DUML load using the CST profile. The kW figures are derived from a wattage report provided by NZTA and the on/off times are derived from a logger.

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 boundaries for clarity.



A field audit was conducted of 494 items of load on 9 May 2024.

1.9. Summary of previous audit

The previous audit was completed in June 2022 by Rebecca Elliot of Veritek Limited. This found six non-compliances and made no recommendations. The status of these is detailed in the table below:

Subject	Section	Clause	Non-Compliance	Status
Distributed unmetered load audits	1.10	16A.26 and 17.295F	Audit not completed by the due date.	Repeated
Deriving submission information	2.1	11(1) of Schedule 15.3	Over submission of 8,479.90 kWh for the month of December 2021 due to no wattage report being received. 65 items of load on SH58 missing from the NZTA database report provided to Genesis for submission resulting in an estimated under submission of 54,712 kWh per annum. In absolute terms, total annual consumption is estimated to be 29,500 kWh higher than the DUML database indicates. The database is outside of the allowable +/-5% threshold. There is a 95% level of confidence that the annual consumption is between 46,900 kWh p.a. lower to 115,100 kWh p.a. higher than the database indicates. 51 items of load with no ICP recorded resulting in a possible under submission of 27,680 kWh per annum. 30 items of load with a blank or unknown lamp model and no lamp wattage or ballast wattage recorded resulting in an estimated under submission of 19,988 kWh per annum. 171 items of load with the incorrect ballast assigned resulting in an estimated under submission of 35,389 per annum. Some LED lights recorded in the database at the maximum wattage but are burning at a lower wattage resulting in some over submission. Database reporting is a monthly snapshot and does not record historic changes.	Still existing
ICP identifier and items of load	2.2	11(2)(a) and (aa) of Schedule 15.3	51 items of load with no ICP recorded resulting in a possible under submission of 27,680 kWh per annum.	Cleared
Description and capacity of load	2.4	11(4) of Schedule 15.3	30 items of load with a blank or unknown lamp model and no lamp wattage or ballast wattage recorded resulting in an estimated under submission of 19,988 kWh per annum.	Still existing
Database accuracy	3.1	15.2 and 15.37B(b)	In absolute terms, total annual consumption is estimated to be 29,500 kWh higher than the DUML database indicates. The database is outside of the allowable +/-5% threshold. There is a 95% level of confidence that the annual consumption is between 46,900 kWh p.a. lower to 115,100 kWh p.a. higher than the database indicates.	Still existing

Subject	Section	Clause	Non-Compliance	Status
			30 items of load with a blank or unknown lamp model and no lamp wattage or ballast wattage recorded resulting in an estimated under submission of 19,988 kWh per annum. 171 items of load with the incorrect ballast assigned resulting in an estimated under submission of 35,389 per annum. Some LED lights recorded in the database at the maximum wattage but are burning at a lower wattage resulting in some over submission. 51 items of load with no ICP recorded resulting in a possible under submission of 27,680 kWh per annum.	
Volume information accuracy	3.2	15.2 and 15.37B(c)	Over submission of 8,479.90 kWh for the month of December 2021 due to no wattage report being received. 65 items of load on SH58 missing from the NZTA database report provided to Genesis for submission resulting in an estimated under submission of 54,712 kWh per annum. In absolute terms, total annual consumption is estimated to be 29,500 kWh higher than the DUML database indicates. The database is outside of the allowable +/-5% threshold. There is a 95% level of confidence that the annual consumption is between 46,900 kWh p.a. lower to 115,100 kWh p.a. higher than the database indicates. 51 items of load with no ICP recorded resulting in a possible under submission of 27,680 kWh per annum. 30 items of load with a blank or unknown lamp model and no lamp wattage or ballast wattage recorded resulting in an estimated under submission of 19,988 kWh per annum. 171 items of load with the incorrect ballast assigned resulting in an estimated under submission of 35,389 per annum. Some LED lights recorded in the database at the maximum wattage but are burning at a lower wattage resulting in some over submission. Database reporting is a monthly snapshot and does not record historic changes.	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 requested Veritek to undertake this streetlight audit.

Audit commentary

The audit was due to be completed by 31 January 2023 and is therefore more than a year late. This item is recorded as cleared, because there is now a combined database available for audit, which Genesis receives a monthly copy of.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 1.9 With: Clause 16A.26 From: 01-Jan-23 To: 29-Mar-24	Audit not completed by the due date. Potential impact: Medium Actual impact: Medium Audit history: Twice previously. Controls: Weak Breach risk rating: 9
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as weak because this is the third time this audit has been completed late. The audit delay leads to a delay in correcting data, and the corrections are now outside the 14-month window, therefore the impact is recorded as high.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis is now receiving consistent monthly data extract snapshots	Continuous Improvement	Cleared
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Genesis is now receiving consistent monthly data extract snapshots	Continuous Improvement	

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

Submission is based on a wattage report received intermittently from NZTA. Two ICPs were not in the database extract provided for the audit, but Genesis received data in August 2023. Submission did not occur for two ICPs because data had not been provided, but data was provided for the audit. One ICP has a status of "new connection in progress" but has data in the database. Three ICPs have the incorrect UNM profile populated in the registry. The remaining ICPs have the CST profile populated in the registry, but this profile was deemed unsuitable for use during the recent profile audit. Some ICPS appear to have lights in different regions, suggesting the incorrect ICP allocation.

The table below shows the discrepancies mentioned above.

ICP	NSP	Status	Profile	Date data provided	Feb 2024 submission (kWh)	kWh calculated from database	Difference	Comments
1001102038UN6D0	TKR0331	Active	CST	Feb 2024	56,678	56,678	0	ICP includes lights from Plimmerton (PNI0331), Pukerua Bay (PNI0331) and Petone (GDF0331)
1001102039UNA95	PNI0331	Active	CST	Feb 2024	10,922	10,922	0	Has lights in Porirua which should be TKR0331
1001102046UN016	CPK0331	Active	CST	Feb 2024	1,187	1,187	0	Looks like it should be KWA0111
1001102047UNC53	UHT0330	Active	CST	Feb 2024	21,517	21,517	0	Some Lower Hutt should be MLG0111
1001102049UNFC8	MLG0331	Active	CST	Aug 2023	14,397	0	-14,397	Seems there should be lights against MLG0331
1001105788UNF00	PNI0331	Active	CST	Aug 2023	21,968	0	-21,968	Seems there should be lights against PNI0331
0110013115EL2CA	PRM0331	Active	CST	Feb 2024	12,148	12,148	0	
0110013116ELE0A	PRM0331	Active	CST	Feb 2024	17,397	17,397	0	
0000172620CKC5D	KWA0111	1,12	UNM	Not received	0	18,725	18,725	Should this be “active”? And DST?
0000171051CK1A3	GDF0331	Active	CST	Feb 2024	5,471	5,472	0	
0000172402CKB8A	HAY0111	Active	CST	Not received	0	3,393	3,393	
0000171050CKDE6	MLG0111	Active	UNM	Feb 2024	11,204	11,204	0	Looks like DUML not standard UML
0000172555CK74C	GDF0331	Active	UNM	Feb 2024	12	12	0	33 lights in one location. Are these standard unmetered?

The impact on submission accuracy is not clear until an investigation is undertaken in conjunction with NZTA to determine which dataset is correct.

As recorded in **section 3.1**, over submission has occurred and the estimated total annual over submission is 476,400 kWh.

ISSUE	Annualised kWh impact += under submission -=over submission
Blank wattage for 11 128w LEDs	6,014
Insufficient description details for 169 items of load	0
400w HPS with a 28-watt ballast, which should be 38	42.71
TOTAL	**6,056**

Database reporting is a snapshot and does not detail historic changes.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 01-Feb-22 To: 11-May-24	The database is outside of the allowable +/-5% threshold. Over submission has occurred of 466,500 kWh per annum. 11 items of load with blank wattage. One item of load with incorrect ballast. Database reporting is a monthly snapshot and does not record historic changes. Non-compliant CST profile used. Potential impact: High Actual impact: High Audit history: Twice previously Controls: Weak Breach risk rating: 9
Audit risk rating	**Rationale for audit risk rating**
High	The controls are recorded as weak because the database accuracy indicates the current processes in place do not mitigate risk to an acceptable level. The impact on settlement and participants is high based on the cumulative kWh error; therefore, the audit risk rating is high.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis is continuing to work on our Profile application for approval. NZTA are aware of the findings and the field findings have been provided to NZTA for them to carry out a full investigation including blank or incorrect data.	Continuous Improvement	Identified

Preventative actions taken to ensure no further issues will occur	Completion date	
Genesis is continuing to work on our Profile application for approval	Continuous Improvement	

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

Code reference

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

Code related audit information

The DUML database must contain:

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

Audit observation

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

Audit commentary

The database extract provided had an ICP recorded for all items of load. ICP accuracy is discussed in **section 3.1**.

Audit outcome

Compliant

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

Code reference

Clause 11(2)(b) of Schedule 15.3

Code related audit information

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

Audit observation

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

Audit commentary

The database contains fields for the road name, location number, and GPS coordinates.

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 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 lamp make model description, lamp wattage and gear wattage.

68 items of load have a blank light model description and 140 have insufficient details to identify the wattage.

11 items of load have a blank wattage.

The accuracy of the non-zero 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: 01-Feb-22 To: 11-May-24	68 items of load with a blank lamp model. 140 items of load with insufficient descriptions. 11 items of load with blank wattage. Potential impact: Medium Actual impact: Medium Audit history: Twice previously Controls: Weak Breach risk rating: 3
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are recorded as weak as discrepancies such as this are not being checked for and therefore not corrected. The impact is assessed to be low based on the kWh impact.

Actions taken to resolve the issue	Completion date	Remedial action status
NZTA are aware of the findings and the field findings have been provided to NZTA for them to carry out a full investigation including blank or incorrect data.	Continuous Improvement	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	

NZTA are aware of the findings and the field findings have been provided to NZTA for them to carry out a full investigation including blank or incorrect data.	Continuous Improvement	

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

A field audit was conducted of 494 items of load.

Audit commentary

The field audit the following discrepancies:

Discrepancy	Quantity
In the field not in the database	6
In the database not in the field	2
Incorrect LED wattage	90
LED upgrade not recorded	174
LED recorded for non-LED	1
Incorrect non-LED	5

The field audit found six additional lights which is recorded as non-compliance. The other discrepancies are recorded in **section 3.1**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3 From: 01-Feb-22 To: 11-May-24	Six additional lights were found in the field. Potential impact: Medium Actual impact: Low Audit history: None Controls: Weak Breach risk rating: 3
Audit risk rating	**Rationale for audit risk rating**

Low	The controls are recorded as weak as discrepancies such as this are not being checked for and therefore not corrected. The impact is assessed to be low based on the kWh impact.

Actions taken to resolve the issue	Completion date	Remedial action status
NZTA are aware of the findings and the field findings have been provided to NZTA for them to carry out a full investigation including blank or incorrect data. It has also been highlighted to NZTA there is missing data due to the additional lights found in field that require further investigation.	Continuous Improvement	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
NZTA are aware of the findings and the field findings have been provided to NZTA for them to carry out a full investigation including blank or incorrect data. It has also been highlighted to NZTA there is missing data due to the additional lights found in field that require further investigation.	Continuous Improvement	

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 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 contains a compliant 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

A field audit was undertaken of 494 items of load. 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	Greater Wellington area NZTA lighting
Strata	The database contains NZTA lighting in the greater Wellington area including Porirua, Hutt Valley and Wellington. The processes for the management of all NZTA items of load are the same, but I decided to place the items of load into four strata based on geographical area or ICP network reference: 1. CK ICP reference, 2. Electra network, 3. Porirua region, and 4. UN ICP reference.
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 15 sub-units.
Total items of load	494 items of load were checked, making up 18% 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 494 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	79.6	Wattage from survey is lower than the database wattage by 20.4%
R_L	68.7	With a 95% level of confidence, it can be concluded that the error could be between -31.3% and -10.6%
R_H	89.4	

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 variability of the sample results across the strata with statistical significance means that the true wattage (installed in the field) could be between 10.8% lower and 32.1% lower than the wattage recorded in the DUML database. Non-compliance is recorded because the error is greater than 5.0%.

- In absolute terms the installed capacity is estimated to be 109kW lower than the database indicates.
- There is a 95% level of confidence that the installed capacity is between 57 kW lower and 168 kW lower than the database.
- In absolute terms, total annual consumption is estimated to be 466,500 kWh lower than the DUML database indicates.
- There is a 95% level of confidence that the annual consumption is between 243,200 kWh p.a. lower to 717,900 kWh p.a. lower than the database indicates.

The only way to ensure this database is accurate is to conduct a full field audit, after the database updating processes have been developed.

Description	Recommendation	Audited party comment	Remedial action
Database accuracy	Conduct a 100% field audit of the database to ensure it is accurate.	NZTA are aware of the findings and it has been highlighted to NZTA that a full field audit is recommend to identify and rectify their database discrepancies and increase the accuracy of their database.	Investigating

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

Scenario	Description
	(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 %

Light description and capacity accuracy

As discussed in **section 2.4**, 68 items of load have a blank light model description and 140 have insufficient details to identify the wattage. 11 items of load have a blank wattage.

Examination of the database found the following ballast discrepancy:

Lamp Type	Ballast recorded	Expected ballast	Number of items of load affected	Estimated Annualised submission impact
400W HPS	28	38	1	43
TOTAL			**1**	**43**

ICP number accuracy

As detailed in **section 2.2**, all items of load have an ICP recorded. As recorded in **section 2.1**, it appears many items of load have the incorrect ICP recorded.

Location information

The database contains fields for the road name, location number, and GPS coordinates. All items of load have GPS coordinates populated.

Change management process findings

Fulton Hogan are the field contractor. All changes made in the field are lodged in Pocket RAMM. The database is managed by Capital Journeys. NZTA maintain an overview of the database and produce the wattage report. The field audit indicates that not all changes made in the field are being updated in RAMM. I recommend these processes are reviewed.

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.	NZTA are aware of the findings and that the recommendation of reviewing this process to ensure the accuracy of their database and any changes are being updated & recorded accurately.	Investigating

Festive and private lights

There are no private or festive lights connected to the NZTA greater Wellington lighting load.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 01-Feb-22 To: 11-May-24	The database is outside of the allowable +/-5% threshold. Over submission has occurred of 466,500 kWh per annum. 11 items of load with blank wattage. 68 items of load have a blank light model description and 140 have insufficient details to identify the wattage. One item of load with incorrect ballast. Many items of load have incorrect ICPs. Potential impact: High Actual impact: High Audit history: Once Controls: Weak Breach risk rating: 9
Audit risk rating	**Rationale for audit risk rating**
High	The controls are recorded as weak because the database accuracy indicates the current processes in place do not mitigate risk to an acceptable level. The impact on settlement and participants is high based on the cumulative kWh error; therefore, the audit risk rating is high.

Actions taken to resolve the issue	Completion date	Remedial action status
NZTA are aware of the findings and the field findings have been provided to NZTA for them to carry out a full investigation including blank or incorrect data. It has also been highlighted to NZTA there is missing data due to the additional lights found in field that require further investigation.	Continuous Improvement	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
NZTA are aware of the findings and the field findings have been provided to NZTA for them to carry out a full investigation including blank or incorrect data. It has also been highlighted to NZTA there is missing data due to the additional lights found in field that require further investigation.	Continuous Improvement	

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

Submission is based on a wattage report received intermittently from NZTA. Two ICPs were not in the database extract provided for the audit, but Genesis received data in August 2023. Submission did not occur for two ICPs because data had not been provided, but data was provided for the audit. One ICP has a status of "new connection in progress" but has data in the database. Three ICPs have the incorrect UNM profile populated in the registry. The remaining ICPs have the CST profile populated in the registry, but this profile was deemed unsuitable for use during the recent profile audit. Some ICPS appear to have lights in different regions, suggesting the incorrect ICP allocation.

The table below shows the discrepancies mentioned above.

ICP	NSP	Status	Profile	Date data provided	Feb 2024 submission (kWh)	kWh calculated from database	Difference	Comments
1001102038UN6D0	TKR0331	Active	CST	Feb 2024	56,678	56,678	0	ICP includes lights from Plimmerton (PNI0331), Pukerua Bay (PNI0331) and Petone (GDF0331)
1001102039UNA95	PNI0331	Active	CST	Feb 2024	10,922	10,922	0	Has lights in Porirua which should be TKR0331
1001102046UN016	CPK0331	Active	CST	Feb 2024	1,187	1,187	0	Looks like it should be KWA0111
1001102047UNC53	UHT0330	Active	CST	Feb 2024	21,517	21,517	0	Some Lower Hutt should be MLG0111
1001102049UNFC8	MLG0331	Active	CST	Aug 2023	14,397	0	-14,397	Seems there should be lights against MLG0331
1001105788UNF00	PNI0331	Active	CST	Aug 2023	21,968	0	-21,968	Seems there should be lights against PNI0331
0110013115EL2CA	PRM0331	Active	CST	Feb 2024	12,148	12,148	0	
0110013116ELE0A	PRM0331	Active	CST	Feb 2024	17,397	17,397	0	
0000172620CKC5D	KWA0111	1,12	UNM	Not received	0	18,725	18,725	Should this be Active? And DST?
0000171051CK1A3	GDF0331	Active	CST	Feb 2024	5,471	5,472	0	
0000172402CKB8A	HAY0111	Active	CST	Not received	0	3,393	3,393	
0000171050CKDE6	MLG0111	Active	UNM	Feb 2024	11,204	11,204	0	Looks like DUML not standard UML
0000172555CK74C	GDF0331	Active	UNM	Feb 2024	12	12	0	33 lights in one location. Are these standard unmetered?

The impact on submission accuracy is not clear until an investigation is undertaken in conjunction with NZTA to determine which dataset is correct.

As recorded in **section 3.1**, over submission has occurred and the estimated total annual over submission is 476,400 kWh.

ISSUE	Annualised kWh impact += under submission -=over submission
Blank wattage for 11 128w LEDs	6,014
Insufficient description details for 169 items of load	0
400w HPS with a 28-watt ballast, which should be 38	42.71
TOTAL	6**,056**

Database reporting is a snapshot and does not detail historic changes.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: 01-Feb-22 To: 11-May-24	The database is outside of the allowable +/-5% threshold. Over submission has occurred of 466,500 kWh per annum. 11 items of load with blank wattage. One item of load with incorrect ballast. Database reporting is a monthly snapshot and does not record historic changes. Potential impact: High Actual impact: High Audit history: Twice previously Controls: Weak Breach risk rating: 9
Audit risk rating	**Rationale for audit risk rating**
High	The controls are recorded as weak because the database accuracy indicates the current processes in place do not mitigate risk to an acceptable level. The impact on settlement and participants is high based on the cumulative kWh error; therefore, the audit risk rating is high.

Actions taken to resolve the issue	Completion date	Remedial action status
NZTA are aware of the findings and the field findings have been provided to NZTA for them to carry out a full investigation including blank or incorrect data. It has also been highlighted to NZTA there is missing data due to the additional lights found in field that require further investigation.	Continuous Improvement	Identified

Preventative actions taken to ensure no further issues will occur	Completion date	
NZTA are aware of the findings and the field findings have been provided to NZTA for them to carry out a full investigation including blank or incorrect data. It has also been highlighted to NZTA there is missing data due to the additional lights found in field that require further investigation.	Continuous Improvement	

CONCLUSION

The database is held by NZTA and is an amalgamation of several other databases. Regular reporting has only been provided to Genesis since August 2023.

The audit found many ICP related discrepancies affecting ICP accuracy, status and profiles, which in turn have affected submission accuracy.

The database has poor accuracy; the field audit identified discrepancies with 56% of the 494 items of load audited. Over submission is occurring by an estimated 466,500 kWh per annum. Revisions can only go back 14 months, however it's likely the inaccuracies occurred prior to that.

The only solution to getting an accurate database, is to conduct a 100% field audit, which I recommend in **section 3.1**.

Six non-compliances were identified, and two recommendations are raised. The future risk rating of 42 indicates that the next audit be completed in three months. I have considered this in conjunction with Genesis's response and I recommend the next audit is conducted in six months, which provides sufficient time to conduct a full field audit of the 2,800 items of load in the database.

PARTICIPANT RESPONSE

Genesis agrees with the findings. The field findings have been passed on to NZTA and it has been highlighted and recommended with NZTA that a full field audit is conducted to identify the inaccurate data to have their databased updated to increase their accuracy.

Since the field findings have been passed to NZTA there has not been a response to the findings. Genesis continues to work with NZTA to ensure accuracy of their database and will continue to discuss the findings and recommendations.