ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

For

NZTA ELECTRONET AREA AND MANAWA LIMITED
NZBN: 9429038917912

Prepared by: Steve Woods

Date audit commenced: 28 March 2023

Date audit report completed: 3 May 2023

Audit report due date: 10 May 2023

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EXECUTIVE SUMMARY

This audit of the **NZTA ElectroNet area** (**NZTA**) DUML database and processes was conducted at the request of **Manawa Energy Limited (Manawa)** 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 Arc GIS database used for submission is managed by ElectroNet, on behalf of Westpower. ElectroNet provide a monthly report from the database to Manawa. New connection, fault, and maintenance work is completed by ElectroNet. GIS Field Maps is used in the field to record information.

Manawa reconciles this DUML load under the "CNIR" participant code using the STL profile. Submissions are based on the database information with on and off times derived from data logger information. Wattages are derived from a database extract Manawa receives monthly.

I recalculated the submissions for February 2023 using the data logger and the database information. I confirmed that it was calculated accurately based on the database and data logger information.

The field audit was undertaken of a statistical sample of 108 items of load was undertaken on 22nd and 23rd April 2023. The "database auditing tool" was used to analyse the results. This confirmed that the database accuracy is within the allowable +/-5% variance threshold.

This audit found one non-compliance and repeats one recommendation. The future risk rating of 2 indicates that the next audit be completed in 24 months. I have considered this in conjunction with Manawa's responses and recommend that the next audit be in 24 months.

The matters are detailed below:

AUDIT SUMMARY

NON-COMPLIANCES

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
All load recorded in database	2.5	11(2A) of Schedule 15.3	Two additional lights found in the field of the sample of 108 items of load checked.	Moderate	Low	2	
Future Risk Rating						2	

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	Record LED light make and model in the database to confirm that the correct wattage is recorded in the 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

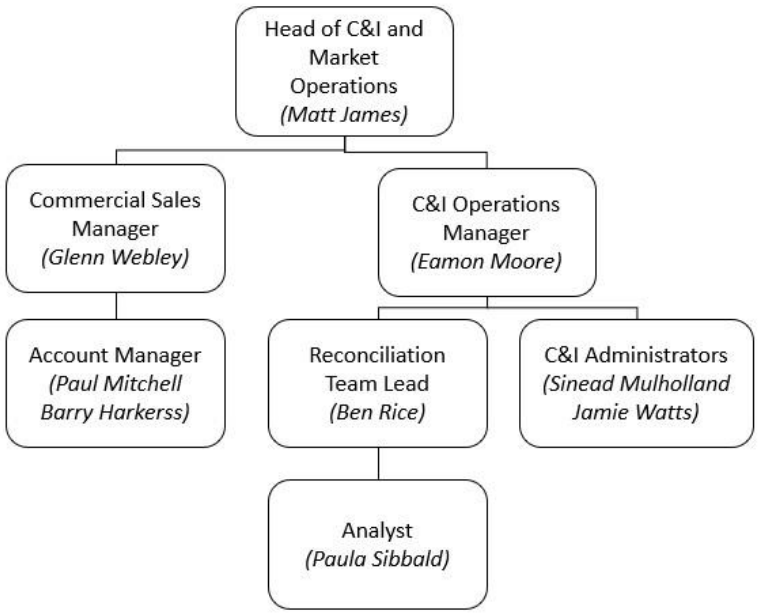
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

Audit commentary

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

1.2. Structure of Organisation

Manawa provided a copy of their organisational structure:



1.3. Persons involved in this audit

Auditor:

Name	Company	Role
Steve Woods	Veritek Limited	Lead Auditor
Claire Stanley	Veritek Limited	Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Eamon Moore	C & I Operations Manager	Manawa Energy
Callie Dando	GIS Technician	ElectroNet
Chris Busson	GIS Administrator	ElectroNet

1.4. Hardware and Software

The Arc GIS SQL database used for the management of DUML is managed by ElectroNet.

The database back up is in accordance with standard industry procedures. Access to the database is restricted using a login and password.

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

1.5. Breaches or Breach Allegations

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

1.6. ICP Data

ICP Number	Description	NSP	Profile	Number of items of load	Database wattage (watts)
0000950100WPF4D	NZTA Westcoast	DOB0331	STL	158	18,540
0000950111WP9A5	NZTA Westcoast	GYM0661	STL	244	52,184
0000950112WP565	NZTA Westcoast	HKK0661	STL	194	24,061
0000950113WP920	NZTA Westcoast	KUM0661	STL	40	5,768
0000950114WP4EA	NZTA Westcoast	OTI0111	STL	2	206
0000950115WP8AF	NZTA Westcoast	RFN1101	STL	93	9,963
0000950116WP46F	NZTA Westcoast	RFN1102	STL	52	8,056
			Total	**783**	**118,778**

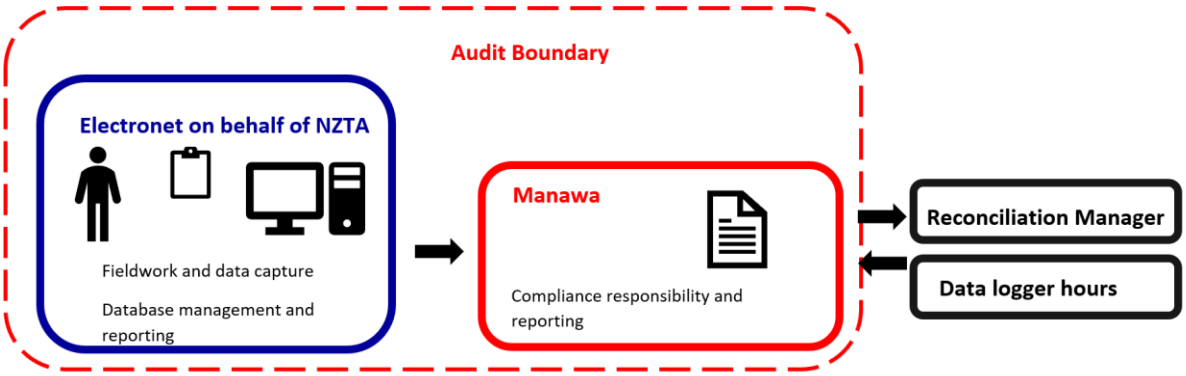
1.7. Authorisation Received

All information was provided directly by Manawa and ElectroNet.

1.8. Scope of Audit

The Arc GIS database used for submission is managed by ElectroNet, on behalf of Westpower. New connection, fault, and maintenance work is completed by ElectroNet, who use 'Field Maps' in the field to complete field work and collect lamp details. ElectroNet provide a monthly report from the database to Manawa.

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.



A field audit of a statistical sample of 108 items of load was undertaken on 22nd and 23rd April 2023. The sample was selected from three strata:

- rural north,
- rural south, and
- urban.

1.9. Summary of previous audit

The previous audit was completed in November 2021 by Rebecca Elliot of Veritek Limited. Four non-compliances were identified, and one recommendation was repeated. The current status of these is detailed below.

Table of Non-Compliance

Subject	Section	Clause	Non-Compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	The data used for submission does not track changes at a daily basis and is provided as a snapshot. 15 items of permanent load have the incorrect ballast applied indicating an estimated very minor over submission of 128 kWh per annum.	Cleared Cleared
All load recorded in database	2.5	11(2A) of Schedule 15.3	Four additional lights found in the field of the sample of 91 items of load checked.	Still existing for two items of load.
Database accuracy	3.1	15.2 and 15.37B(b)	15 items of permanent load have the incorrect ballast applied indicating a very minor estimated over submission of 128 kWh per annum.	Cleared
Volume information accuracy	3.2	15.2 and 15.37B(c)	The data used for submission does not track changes at a daily basis and is provided as a snapshot. 15 items of permanent load have the incorrect ballast applied indicating a very minor estimated over submission of 128 kWh per annum.	Cleared Cleared

Table of Recommendations

Subject	Section	Recommendation	Status
Database accuracy	3.1	Record LED light make and model in the database to confirm that the correct wattage is recorded in the 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

Trustpower 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

Manawa reconciles this DUML load using the STL profile. Submissions are based on the database information with on and off times derived from data logger information. Wattages are derived from a database extract Manawa receives monthly.

I recalculated the submissions for February 2023 using the data logger and the database information. I confirmed that it was calculated accurately based on the database and data logger information.

The field audit confirmed that the database is within the allowable +/-5% accuracy threshold.

The monthly report is provided with additional information containing any changes made through the month, including the date the changes were made.

Audit outcome

Compliant

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

All items of load have an ICP number recorded.

Audit outcome

Compliant

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

Code reference

Clause 11(2)(b) of Schedule 15.3

Code related audit information

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

Audit observation

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

Audit commentary

The database contains fields for the street name, area and GPS coordinates. All items of load have a GPS location and a street address recorded.

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

A description of each light is recorded in the light type field, and total wattage, including ballast. All items of load have a light type and wattage populated.

The accuracy of the lamp description, capacity and ballasts recorded is discussed in **section 3.1**.

Audit outcome

Compliant

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

Code reference

Clause 11(2A) of Schedule 15.3

Code related audit information

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

Audit observation

A field audit of a statistical sample of 108 items of load was undertaken on 22nd and 23rd April 2023. The sample was selected from three strata:

- rural north,
- rural south, and
- urban.

Audit commentary

The field audit discrepancies are detailed in the table below:

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
High St	39	39		6	2 x 250W SON recorded in the database but 2 x 149W LED located in the field. 3 x 150W SON recorded in the database but 3 x 149W LED located in the field. 1x 150W SON recorded in the database but 1 x 103W LED located in the field.
Seven Mile Rd	19	19		1	1 x 40W FLURO recorded in the database but 103W LED located in the field.
Stewart St	10	10		1	75W LED recorded in the database but 103W LED located in the field.
State Highway 7	118	120	+2	2	1 x 70W SON recorded in the database but 149W LED located in field. 1 x 150W SON recorded in the database but 1 x 149W LED located in the field. 1 additional 149W LED not recorded in the database but located in the field. 1 additional 150W SON not recorded in the database but located in the field.
GRAND TOTAL	**108**	**110**	**2**	**10**	

The field audit found two additional lights in the field. This is recorded as non-compliance below.

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

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3 From: 18-Nov-20 To: 16-Aug-21	Two additional lights found in the field of the sample of 108 items of load checked. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	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 due to the small number of additional lights found.

Actions taken to resolve the issue	Completion date	Remedial action status
Manawa energy to work with database manager, ElectroNet, to confirm the presence of the additional lamps and update the database as appropriate.	01/09/2023	Identified
Preventative actions taken to ensure no further issue will occur	**Completion date**	
Manawa to communicate with ElectroNet the importance of updating DUML database with changes. Manawa to Establish a business process whereby Administrators at Manawa Energy, responsible for processing DUML load changes each month, will conduct reasonableness checks on the light changes being notified.	01/09/2023	

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

Code reference

Clause 11(3) of Schedule 15.3

Code related audit information

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

Audit observation

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

Audit commentary

The 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 database has a complete and 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

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	NZTA ElectroNet Westland region
Strata	The database contains the NZTA items of load in Westland area. The processes for the management of all NZTA items of load are the same. I created three geographical strata: • rural north, • rural south, and • urban.
Area units	I created a pivot table of the roads based on the strata and I used a random number generator in a spreadsheet to select a total of 31 sub-units.
Total items of load	108 items of load were checked.

Wattages for all items of load were checked against the published standardised wattage tables produced by the Electricity Authority or LED light specifications where available against the DUML database.

Audit commentary

A field audit was conducted of a statistical sample of 108 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	98.2%	Wattage from survey is higher than the database wattage by 1.8%
R_L	96.2%	With a 95% level of confidence, it can be concluded that the error could be between -3.8% and 1.2%.
R_H	101.2%	

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 A (detailed below) applies.

The conclusion from Scenario A is that the variability of the sample results across the strata means that the true wattage (installed in the field) could be 1.8% higher than the wattage recorded in the DUML database. Compliance is recorded because the potential error is less than 5.0%.

In absolute terms the installed capacity is estimated to be 2.0 kW lower than the database indicates.

There is a 95% level of confidence that the installed capacity is between 5kW lower and 1kW higher than the database.

In absolute terms, total annual consumption is estimated to be 9,300 kWh lower than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 19,400 kWh p.a. lower and 6,200 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

Wattages for all items of load were checked against the published standardised wattage table produced by the Electricity Authority in the database and found all wattages were correct.

The field audit was considered compliant, however there were 10 incorrect wattages from the sample of 108 as detailed in **section 2.5.**

There are 320 LED lights in the field, and I repeat the recommendation from the previous audits to populate the lamp make and model.

Recommendation	Description	Audited party comment	Remedial action
Database Accuracy	Record LED light make and model in the database to confirm that the correct wattage is recorded in the database.	Recommendation is noted, this will be recorded as an actionable outcome from this audit. Manawa to engage ElectroNet on database management and suggest database change.	Identified

Change management process findings

There have been no changes to the processes in place during the audit period. The Arc GIS database used for submission is managed by ElectroNet, on behalf of Westpower. New connection, fault, and maintenance work is completed by ElectroNet, who update the GIS. GIS Field Maps is used in the field to record information. Westpower office staff validate the data and post it to the database after the field devices are synchronised to the main database.

Any new connections for NZTA in the ElectroNet area are managed and follow the same process that is in place for Westland District Council.

Maximo workflow is used to manage all new connections and includes a step to update GIS information. Once the installation job is complete, a work task is created for the GIS team to check the Arc GIS database is up to date.

There are no private or festive lights associated with the NZTA lights.

Audit outcome

Compliant

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

Manawa reconciles this DUML load using the STL profile. Submissions are based on the database information with on and off times derived from data logger information. Wattages are derived from a database extract Manawa receives monthly.

I recalculated the submissions for February 2023 using the data logger and the database information. I confirmed that it was calculated accurately based on the database and data logger information.

The field audit confirmed that the database is within the allowable +/-5% accuracy threshold.

The monthly report is provided with additional information containing any changes made through the month, including the date the changes were made.

Audit outcome

Compliant

CONCLUSION

The Arc GIS database used for submission is managed by ElectroNet, on behalf of Westpower. ElectroNet provide a monthly report from the database to Manawa. New connection, fault, and maintenance work is completed by ElectroNet. GIS Field Maps is used in the field to record information.

Manawa reconciles this DUML load under the "CNIR" participant code using the STL profile. Submissions are based on the database information with on and off times derived from data logger information. Wattages are derived from a database extract Manawa receives monthly.

I recalculated the submissions for February 2023 using the data logger and the database information. I confirmed that it was calculated accurately based on the database and data logger information.

The field audit was undertaken of a statistical sample of 108 items of load was undertaken on 22nd and 23rd April 2023. The "database auditing tool" was used to analyse the results. This confirmed that the database accuracy is within the allowable +/-5% variance threshold.

This audit found one non-compliance and repeats one recommendation. The future risk rating of 2 indicates that the next audit be completed in 24 months. I have considered this in conjunction with Manawa's responses and recommend that the next audit be in 24 months.

PARTICIPANT RESPONSE

The audit has revealed that this DUML is generally well managed with only a small discrepancy in the database managed by ElectroNet. Manawa Energy sees the main opportunity for improvement as clear communication with our customer and improvements in our internal reasonable checking. We expect this work will take a few months to complete.

Manawa supports the outcome of the audit, and the future risk rating of 2, and believe a 24-month audit period for this DUML is appropriate given its accuracy.

Thank you to Veritek for the time taken to complete this audit and finalise the report.