ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

MARLBOROUGH LINES LIMITED AND GENESIS ENERGY LIMITED

Prepared by: Rebecca Elliot

Date audit commenced: 30 September 2019

Date audit report completed: 27 November 2018

Audit report due date: 01-Dec-19

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EXECUTIVE SUMMARY

This audit of the Marlborough Lines Limited's (**Marlborough Lines**) Unmetered Streetlight 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.

An EAM database is managed by Marlborough Lines on behalf of Marlborough District Council (MDC), Port Marlborough (PMNZ) and NZTA in relation to this load with monthly reporting to Genesis. The field work, asset data capture, and database population is conducted by Marlborough Lines' staff.

The field audit was undertaken of a statistical sample of 461 items of load on 4th & 5th November 2019. This found a high level of accuracy and the database accuracy was within the required +/-5%.

Marlborough Lines have robust processes in place for the management of the streetlight database. I have made three recommendations to further improve the detail recorded in the database.

Genesis have carried out revisions to correct the incorrect submission calculation identified in the last audit.

Examination of the EAM database found that when changes are made, only the record present at the time the report is run is recorded, not the historical information showing dates of changes is provided. This does not meet the database requirements and is recorded as non-compliance below.

The audit found five non-compliances and makes three recommendations. The future risk rating of 14 indicates that the next audit be completed in 12 months and I agree with this recommendation.

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	The monthly wattage report provided does not track changes at a daily basis and is provided as a snapshot. Festive lighting recorded as connected all year.	Weak	Low	3	Investigating
Tracking of load change	2.6	11(3) of Schedule 15.3	Changes not tracked.	Weak	Low	3	Investigating
Audit trails	2.7	11(4) of Schedule 15.3	Audit trail not visible.	Weak	Low	3	Investigating
Database accuracy	3.1	15.2 and 15.37B(b)	Incorrect ballasts applied in EAM resulting in an estimated annual over submission of 7,231 kWh if these were used for submission. The monthly wattage report provided does not track changes at a daily basis and is provided as a snapshot. Festive lighting recorded as connected all year.	Moderate	Low	2	Identified
Volume information accuracy	3.2	15.2 and 15.37B(c)	The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. Festive lighting recorded as connected all year.	Weak	Low	3	Investigating
					Future Risk Rating	**14**	

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

RECOMMENDATIONS

Subject	Section	Description	Action
Deriving submission	2.1	Remove the ICP from the non-streetlight items of load recorded in the database.	Genesis will request the removal of the ICP from these assets
Database accuracy	3.1	Apply wattage values from within the database.	Genesis will advise Marlborough of the incorrect gear wattage applications and advise to make the necessary corrections.
		Ensure LED light descriptions contain sufficient information to confirm the correct wattage has been applied.	Genesis will advise Marlborough of the incomplete lamp descriptions and advise to make the necessary corrections to clearly identify lamp makes/models.

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

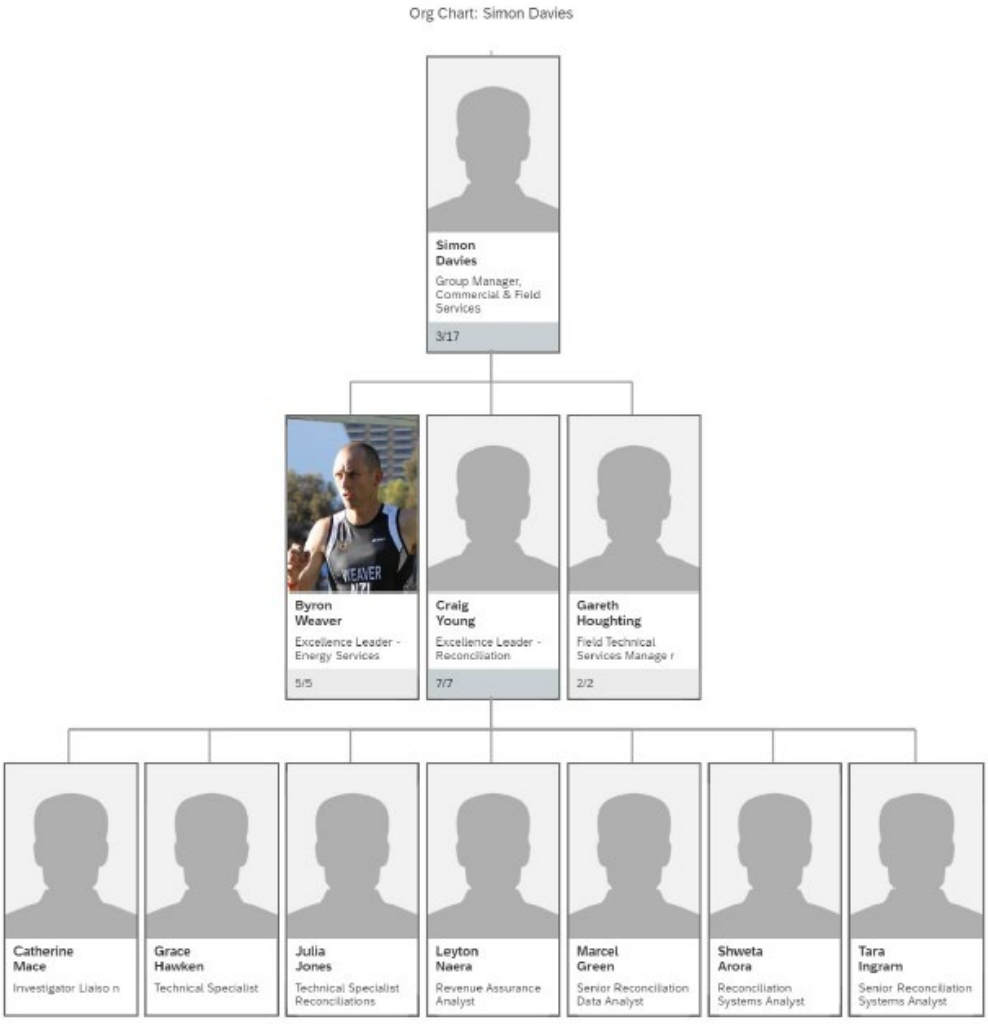
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

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:

Rebecca Elliot

Veritek Limited

Electricity Authority Approved Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Craig Young	Excellence Leader - Reconciliation	Genesis Energy
Grace Hawken	Technical Specialist – Reconciliations Team	Genesis Energy
Robert Miller	GIS Operator	Marlborough Lines
Sally King	Asset Records Clerk	Marlborough Lines

1.4. Hardware and Software

The database used by Marlborough Lines is commonly known as "Info EAM". This has been used since October 2015.

Marlborough Lines confirmed that the database back-up is in accordance with standard industry procedures, which includes servers at two locations with backup tapes rotated between the different premises. Access to the database is secure by way of password protection.

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	Profile	Number of items of load	Database wattage (watts)
0004450225ML4AC	MDC & NZTA	SST	6,026	294,863
0004450157ML277	Port Marlborough	SST	57	9,482
Total			6,083	304,345

1.7. Authorisation Received

All information was provided directly by Genesis or Marlborough Lines.

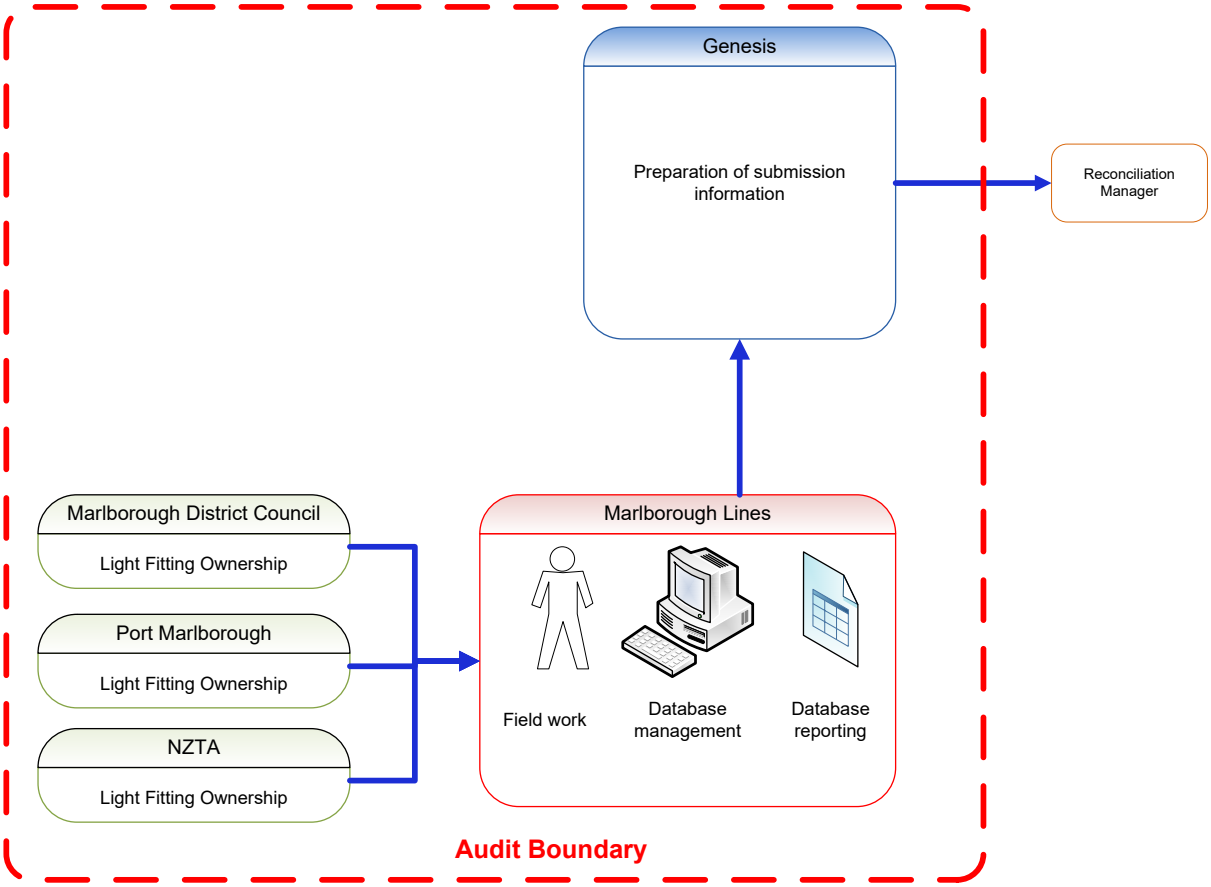
1.8. Scope of Audit

This audit of the Marlborough Lines database and processes was conducted at the request of 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.

Marlborough Lines manage the installation, maintenance and database management of the DUML for MDC, NZTA and PMNZ. Reporting is provided to Genesis on a monthly basis. 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.



Marlborough Line's contract to carry out the field work and manage the database expired in June 2019 but is being extended on a month by month basis. The council is expected to initiate negotiations, but these had not been initiated at the time of this audit.

The field audit was undertaken of a statistical sample of 461 items of load on 4th & 5th November 2019.

1.9. Summary of previous audit

Genesis provided a copy of the last audit report undertaken by Rebecca Elliot of Veritek Limited in November 2018. The table below records the findings.

Table of Non-Compliance

Subject	Section	Clause	Non-compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	The variance between the database extract and the monthly report used by Genesis for submission is resulting in an estimated over submission of 22,430 kWh for the month of October due to incorrect logger values and a lamp count difference between the wattage report and the database extract. Ballasts not derived from the database. Festive lighting recorded as connected all year.	Cleared Still existing Still existing
Database accuracy	3.1	15.2 and 15.37B(b)	Incorrect ballasts applied in EAM resulting in an estimated annual over submission of 9,978 kWh if these were used for submission. Festive lighting recorded as connected all year.	Cleared Still existing
Volume information accuracy	3.2	15.2 and 15.37B(c)	The variance between the database extract and the monthly report used by Genesis for submission is resulting in an estimated over submission of 22,430 kWh for the month of October due to incorrect logger values and a lamp count difference between the wattage report and the database extract. Ballasts not derived from the database. Festive lighting recorded as connected all year.	Cleared Still existing Still existing

Table of Recommendations

Subject	Section	Recommendation for Improvement	Status
Tracking of load change	2.6	Apply wattage values from within 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

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 and the application of profiles was checked. The database was checked for accuracy.

Audit commentary

Genesis reconciles this DUML load using the SST profile.

The total volume submitted to the Reconciliation Manager is based on a monthly database report derived from the Marlborough Lines EAM database and the "burn time" which is sourced from data loggers. The methodology is compliant.

I checked the submission values for September 2019 and confirmed them to be correct. I note the same light count difference of 60 items of load as recorded in the 2018 report. This relates to items of load that are recorded in the database with an ICP recorded against them but are not streetlight assets and therefore have no wattage value associated. I recommend that the ICP is removed to correct this.

Recommendation	Description	Audited party comment	Remedial action
Deriving submission information	Remove the ICP from the non-streetlight items of load recorded in the database.	Genesis will request the removal of the ICP from these assets	Identified

In the last audit it was found that the logger hours applied to calculate the submissions were different due to the unintentional aggregation of the kWh and kVarh consumption. This resulted in over submission to the market:

ICPs	Fittings number from Oct 2018 submission	Fittings number from database extract	Differences	kWh value submitted	Calculated kWh value from database	Differences
0004450225ML4AC	5088	5148	60	119,891	97,670	22,221
0004450157ML277	57	57	0	5,144	3,115	2,209
Total month kWh over submission						22,430

The customer had been billed correctly. I have checked submissions for the relevant revisions and confirmed that revisions have been conducted for the previous 14-month period.

As recorded in the last two audits, the ballasts recorded in EAM are not used and Marlborough Lines continue to add the ballasts outside of the database as part of the monthly wattage report sent to Genesis. The ballast values used in the monthly report were confirmed to be correct. This is discussed in **sections 3.1** and **3.2**.

The field audit confirmed that the database meets the accuracy thresholds and is confirmed to be compliant. This is discussed in **section 3.1**.

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 "Commission date". 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 is provided. It is unknown whether the database is capable of tracking this or not.

As recorded in the last audit, festive lighting is recorded as connected all year. This was confirmed during the site audit. I was unable to determine the specific impact on reconciliation, but the volume of lights associated with this is small. This is detailed in **section 3.1**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 Clause 11(1) of Schedule 15.3 From: 24-Oct-18 To: 31-Oct-19	The monthly wattage report provided does not track changes at a daily basis and is provided as a snapshot. Festive lighting recorded as connected all year. Potential impact: Low Actual impact: Low Audit history: Twice previously Controls: Weak Breach risk rating: 3
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as weak as whilst the processes for updating the database are robust it was not proven that the database is able to meet the requirements of the code. The impact is assessed to be low based on the anticipated volumes associated with the non-compliances found.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis needs to advise Marlborough Lines of the requirement of load tracking. Establish what means Marlborough Lines require to adhere to the code requirement.	01/06/2020	Investigating
Preventative actions taken to ensure no further issue will occur	**Completion date**	
Genesis will continue to work with Marlborough Lines and the Council to establish best practices.	01/06/2020	

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 the correct ICP was recorded against each item of load.

Audit commentary

All items of load have an ICP recorded against them. As detailed in **section 2.1**, there are 60 items of load that are recorded in the database with an ICP recorded against them but are not streetlight assets and therefore have no wattage value associated. I recommend in **section 2.1**, that the ICP is removed to correct this.

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 databases were checked to confirm the location is recorded for all items of load.

Audit commentary

The database has been updated with GPS co-ordinates for all but 164 items of load. The field audit found that some of the GPS co-ordinates are not precise in all instances e.g. some lights are in the ocean or multiple lights are allocated the same GPS co-ordinates in a street. All items of load have sufficient address details to meet the requirements of this clause.

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 it contained a field for lamp type and wattage capacity and included any ballast or gear wattage, and that each item of load had a value recorded in these fields.

Audit commentary

The database contains fields for fitting type and lamp type in additional to a nominal lamp wattage and circuit wattage fields and all were populated for each item of load. The ballasts recorded in EAM are not used for submission and Marlborough Lines add the ballasts outside of the database as part of the monthly wattage report sent to Genesis. The accuracy of the ballast wattages used for submission are discussed in **sections 3.1** and **3.2.**

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

The field audit was undertaken of a statistical sample of 461 items of load on 4th & 5th November 2019.

Audit commentary

The field audit findings for the sample of lamps was accurate with the exception of one street detailed in the table below:

Street/Area	Database Count	Field Count	Lamp no. difference	No of incorrect lamp wattage	Comments
Havelock Street	15	15		1	1 incorrect LED wattage
Grand Total	**461**	**461**		**1**	

The field audit only found one lamp wattage discrepancy. The accuracy of the database is discussed in **section 3.1.**

This clause relates to lights in the field not recorded in the database. There were no additional lights found in the field.

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 database contains a "Commission date". 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, and not the historical information showing dates of changes. The audit trail may be able to be retrieved but this is not visible as required by this clause. This is recorded as non-compliance.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.6 Clause 11(3) of Schedule 15.3 From: 24-Oct-18 To: 31-Oct-19	Changes not tracked. Potential impact: Low Actual impact: Low Audit history: None Controls: Weak Breach risk rating: 3
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as weak as whilst the processes for updating the database are robust it was not proven that the database is able to meet the requirements of the code. The audit risk rating is low as the volume of changes is not high.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis needs to advise Marlborough Lines of the requirement of load tracking. Establish what means Marlborough Lines require to adhere to the code requirement.	01/06/2020	Investigating
Preventative actions taken to ensure no further issue will occur	**Completion date**	
Genesis will continue to work with Marlborough Lines and the Council to establish best practices.	01/06/2020	

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 contains a "Commission date". 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, and not the historical information showing dates of changes. The audit trail may be able to be retrieved but this is not visible as required by this clause. This is recorded as non-compliance.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.7 Clause 11(4) of Schedule 15.3 From: 24-Oct-18 To: 31-Oct-19	Audit trail not visible. Potential impact: Low Actual impact: Low Audit history: None Controls: Weak Breach risk rating: 3
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as weak as whilst the processes for updating the database are robust it was not proven that the database is able to meet the requirements of the code. The audit risk rating is low as the volume of changes is not high.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis needs to advise Marlborough Lines of the requirement of load tracking. Establish what means Marlborough Lines require to adhere to the code requirement.	01/06/2020	Investigating
Preventative actions taken to ensure no further issue will occur	**Completion date**	
Genesis will continue to work with Marlborough Lines and the Council to establish best practices.	01/06/2020	

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	Marlborough DC, NZTA & PMNZ
Strata	The database contains items of load in Marlborough area. The processes for the management of MDC, NZTA and PMNZ items of load are the same, so I decided to place the items of load into four strata, as follows: 1. Rural 2. Urban A-H 3. Urban I-O 4. Urban P-W
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 97 sub-units.
Total items of load	461 items of load were checked.

Wattages were checked for alignment with the published standardised wattage table produced by the Electricity Authority or against LED light specifications where available.

Audit commentary

A statistical sample of 461 items of load found that the field data was 100.1% of the database data for the sample checked.

Result	Percentage	Comments
The point estimate of R	100.1%	Wattage from survey is higher than the database wattage by 0.1%
R_L	100.0%	With a 95% level of confidence it can be concluded that the error could be up to +0.6%
R_H	100.6%	

These results were categorised in accordance with the "Distributed Unmetered Load Statistical Sampling Audit Guideline", effective from 01/02/19 and the table below shows that Scenario A (detailed below) applies. Compliance is recorded because the best estimate indicates that the database is accurate within ±5.0%.

In absolute terms the installed capacity is estimated to be the same as the database indicates.

There is a 95% level of confidence that the installed capacity is between 0 kW and 2 kW higher than the database.

In absolute terms, total annual consumption is estimated to be 1,300 kWh higher than the DUML 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 Wattages and Descriptions

Wattages for all items of load were checked against the published standardised wattage table produced by the Electricity Authority and found the ballasts recorded in EAM are incorrect as detailed below:

Incorrect ballasts	Volume information impact (annual kWh)
2 x CDM M/H 70W lamps have a ballast recorded of 5W instead of 13W.	68 kWh under submission
E/S (E) Ext Ignitor SON- 68 x 70W have a ballast of 20W instead of 7W (electronic ballast	3,387 kWh over submission
GES Elliptical SON • 114 x 150W has a ballast of 22W instead of 18W. • 29 x 250W has a ballast of 29W instead of 28W.	 1,948 kWh over submission 124 kWh over submission
GES Tubular SON • 7 x 70W have a ballast of 20W instead of 13W. • 261 x 150W has a ballast of 22W instead of 18W. • 99 x 250W has a ballast of 29W instead of 28W.	 209 kWh over submission 4,459 kWh over submission 423 kWh over submission
TOTAL	7,231 kWh over submission if used for submission

Marlborough Lines add the ballasts outside of the database. These were checked and confirmed to be correct. The incorrect ballasts recorded in EAM are recorded as non-compliance below. I repeat the last audit's recommendation that the wattage values are corrected and derived from within the database.

Recommendation	Description	Audited party comment	Remedial action
Database accuracy	Apply wattage values from within the database.	Genesis will advise Marlborough of the incorrect gear wattage applications and advise to make the necessary corrections.	Identified

There are 30 different LED light types recorded in the database. The light descriptions are insufficient to confirm the correct wattage has been applied. "As-builts" were examined as part of the field audit undertaken and this confirmed that the light descriptions provided confirmed the correct wattage had been applied. I recommend that the full light descriptions be included in the database so that the LED wattages can be confirmed.

Recommendation	Description	Audited party comment	Remedial action
Database accuracy	Ensure LED light descriptions contain sufficient information to confirm the correct wattage has been applied.	Genesis will advise Marlborough of the incomplete lamp descriptions and advise to make the necessary corrections to clearly identify lamp makes/models.	Identified

Change Management

The new connections process remains the same as was recorded last audit - Marlborough Lines is the contractor for installation and maintenance of all lighting. When new subdivisions or upgrades are conducted, an "as-built" plan is provided. Lighting for new subdivisions is updated as soon as the subdivision is electrically connected and the "commissioning date" is used as the start date. Most are updated within the same month of electrical connection. Light numbers are assigned based on "as-builts" in the database. All lights have the GPS co-ordinates recorded as well as the physical locations. Marlborough Lines carry out field checks to confirm that the "as-builts" reflect what has been installed in the field. As detailed above the LED light descriptions are not sufficient to determine the correct wattage is recorded and I recommend that the full light description is used from the "as-built" drawings.

The change management process remains the same as was recorded in the last audit. A database check is included as part of the lamp replacement process. The job sheet comes directly from the EAM database and requires the field crew to indicate if any discrepancies are found and need to be updated. Daily updates are made to EAM and all changes are made prior to the end of the month.

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 "Commission date". 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 is provided. It is unknown whether the database is capable of tracking this or not.

The LED rollout project is largely complete except for some decorative lights and the NZTA lights still to be replaced. The NZTA light upgrade that was expected in the first half of 2019 is still to progress. All LED lights are CMS ready but there are no plans to implement a CMS system.

Night outage patrols continue for the state highway lighting. These lights are divided into four groups with rolling monthly patrols. Patrols are undertaken by Marlborough Lines and results processed into EAM.

Christmas lighting in Blenheim remains unchanged from previous audits. I confirmed during the site audit that Christmas lights are in the form of decorative festoon lights with white lamps during the year and coloured lamps during the Christmas season. Some of the festoons are on all year round and others are only connected during the Christmas season. These are all LED lights, so the volume associated is likely to be small. This is recorded as non-compliance in **sections 2.1** and **3.2** and below.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 06-May-18 To: 31-Oct-19	Incorrect ballasts applied in EAM resulting in an estimated annual over submission of 7,231 kWh if these were used for submission. The monthly wattage report provided does not track changes at a daily basis and is provided as a snapshot. Festive lighting recorded as connected all year. Potential impact: Low Actual impact: Low Audit history: Twice previously Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as moderate as the ballasts are not derived from the database but are being added correctly for reconciliation purposes. The impact is assessed to be low due to the small amount of over submission associated with Christmas lights recorded as connected year-round.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis to request an monthly extraction of asset values from Marlborough Lines.	01/03/2020	Identified
Preventative actions taken to ensure no further issue will occur	**Completion date**	
Provide exception reporting back to Marlborough Lines recommending the updates to correct any values.	01/03/2020	

3.2. Volume information accuracy (Clause 15.2 and 15.37B(c))

Code reference

Clause 15.2 and 15.37B(c)

Code related audit information

The audit must verify that:

- *volume information for the DUML is being calculated accurately*
- *profiles for DUML have been correctly applied.*

Audit observation

The submission was checked for accuracy for the month the database extract was supplied. This included:

- checking the registry to confirm that the ICP has the correct profile and submission flag; and
- checking the database extract combined with the burn hours against the submitted figure to confirm accuracy.

Audit commentary

Genesis reconciles this DUML load using the SST profile.

The total volume submitted to the Reconciliation Manager is based on a monthly database report derived from the Marlborough Lines EAM database and the "burn time" which is sourced from data loggers. The methodology is compliant.

I checked the submission values for September 2019 and confirmed them to be correct. I note the same light count difference of 60 items of load as recorded in the 2018 report. This relates to items of load that are recorded in the database with an ICP recorded against them but are not streetlight assets and therefore have no wattage value associated. I recommend in **section 2.**1, that the ICP is removed from these items of load to correct this.

In the last audit it was found that the logger hours applied to calculate the submissions were different due to the unintentional aggregation of the kWh and kVarh consumption. This resulted in over submission to the market as detailed in **section 2.1**. Genesis has carried out revisions to correct this. This was confirmed as part of this audit.

The ballasts recorded in EAM are not used and Marlborough Lines add the ballasts outside of the database as part of the monthly wattage report sent to Genesis. The ballast values used were confirmed to be correct. This is discussed in **sections 2.1, 2.4** and **3.1**.

The field audit confirmed that the database meets the accuracy thresholds and is confirmed to be compliant. This is discussed in **section 3.1**.

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 "Commission date". 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 is provided. It is unknown whether the database is capable of tracking this or not.

As recorded in the last audit, festive lighting is recorded as connected all year. This was confirmed during the site audit. I was unable to determine the specific impact on reconciliation, but the volume of lights associated with this is small. This is detailed in **section 3.1**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 Clause 15.2 and 15.37B(c) From: 24-Oct-18 To: 31-Oct-19	The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. Festive lighting recorded as connected all year. Potential impact: Low Actual impact: Low Audit history: Twice previously Controls: Weak Breach risk rating: 3
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as weak as whilst the processes for updating the database are robust it was not proven that the database is able to meet the requirements of the code. The impact is assessed to be low based on the anticipated volumes associated with the non-compliances found.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis needs to advise Marlborough Lines of the requirement of load tracking. Establish what means Marlborough Lines require to adhere to the code requirement.	01/06/2020	Investigating
Preventative actions taken to ensure no further issue will occur	**Completion date**	
Genesis will continue to work with Marlborough Lines and the Council to establish best practices.	01/06/2020	

CONCLUSION

An EAM database is managed by Marlborough Lines on behalf of Marlborough District Council (MDC), Port Marlborough (PMNZ) and NZTA in relation to this load with monthly reporting to Genesis. The field work, asset data capture, and database population is conducted by Marlborough Lines' staff.

The field audit was undertaken of a statistical sample of 461 items of load on 4th & 5th November 2019. This found a high level of accuracy and the database accuracy was within the required +/-5%.

Marlborough Lines have robust processes in place for the management of the streetlight database. I have made three recommendations to further improve the detail recorded in the database.

Genesis have carried out revisions to correct the incorrect submission calculation identified in the last audit.

Examination of the EAM database found that when changes are made, only the record present at the time the report is run is recorded, not the historical information showing dates of changes is provided. This does not meet the database requirements and is recorded as non-compliance below.

The audit found five non-compliances and makes three recommendations. The future risk rating of 14 indicates that the next audit be completed in 12 months and I agree with this recommendation.

PARTICIPANT RESPONSE

Genesis will work with the Council and Marlborough Lines Company to establish database accuracies. Further reporting will enable Genesis to accurately identify anomalies within the Marlborough Lines dataset.