# DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

# WAIROA DISTRICT COUNCIL AND GENESIS ENERGY

Prepared by: Rebecca Elliot

Date audit commenced: 4 May 2021

Date audit report completed: 1 June 2021

Audit report due date: 01-Jun-21

## TABLE OF CONTENTS

## EXECUTIVE SUMMARY

This audit of the **Wairoa District Council (WDC)** Unmetered Streetlights 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.

Previously the Eastland Streetlight Access database managed by Eastland was used to reconcile this load. WDC have been working with WSP, Eastland and Genesis to use the WDC RAMM database and this is expected to be used for reconciliation from 1st June 2021. Therefore, I have assessed the accuracy of the WDC RAMM database in this audit.

However, submission volumes were assessed against the Eastland database as the RAMM database has yet to be used for submission.

NZTA lighting is recorded in the database, but this is being reconciled by NZTA in a separate RAMM database so is outside of the scope of this audit.

The RAMM database has a better level of accuracy than the Eastland Network database. The change management processes are also expected to improve as Eastland (as the contractor) will be updating RAMM directly as changes are made in the field. There are some historic data errors that need to be corrected to bring the database accuracy within the +/-5% allowable threshold. I have recommended that a full field audit is undertaken to correct this.

The audit found four non-compliances and two recommendations are made. The future risk rating of 11 is significant improvement from the score of 31 recorded in the last audit. This indicates that the next audit be completed in 12 months. I have considered this in conjunction with Genesis' comments and 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 database is outside of the allowable +/-5% threshold. In absolute terms, total annual consumption is estimated to be 25,200 kWh lower than the DUML database indicates.<br><br>5x 125W MV lights with the incorrect ballast applied resulting in a very minor estimated over submission of 299kWh per annum.<br><br>The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. | Moderate | Medium | 4 | Identified |
| ICP Identifier | 2.2 | 11(2)(a) and (aa) of Schedule 15.3 | ICP not yet recorded in the database. | Strong | Low | 1 | Identified |

| Subject | Section | Clause | Non-Compliance | Controls | Audit Risk Rating | Breach Risk Rating | Remedial Action |
|---|---|---|---|---|---|---|---|
| Database accuracy | 3.1 | 15.2 and 15.37B(b) | The database is outside of the allowable +/-5% threshold. In absolute terms, total annual consumption is estimated to be 25,200 kWh lower than the DUML database indicates.<br>246 LED lights with no make or model recorded.<br>5x 125W MV lights with the incorrect ballast applied resulting in a very minor estimated over submission of 299kWh per annum.<br>ICP still to be populated to the RAMM database. | Strong | Medium | 2 | Identified |
| Volume information accuracy | 3.2 | 15.2 and 15.37Bc | The database is outside of the allowable +/-5% threshold. In absolute terms, total annual consumption is estimated to be 25,200 kWh lower than the DUML database indicates.<br>5x 125W MV lights with the incorrect ballast applied resulting in a very minor estimated over submission of 299kWh per annum.<br>The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. | Moderate | Medium | 4 | Identified |
| | | | | | **Future Risk Rating** | **11** | |

| **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 |
|---|---|---|
| Database Accuracy | 3.1 | 100% field audit is undertaken to correct historic errors. |
| | | Populate zero ballast wattage for all LED lights |

## 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

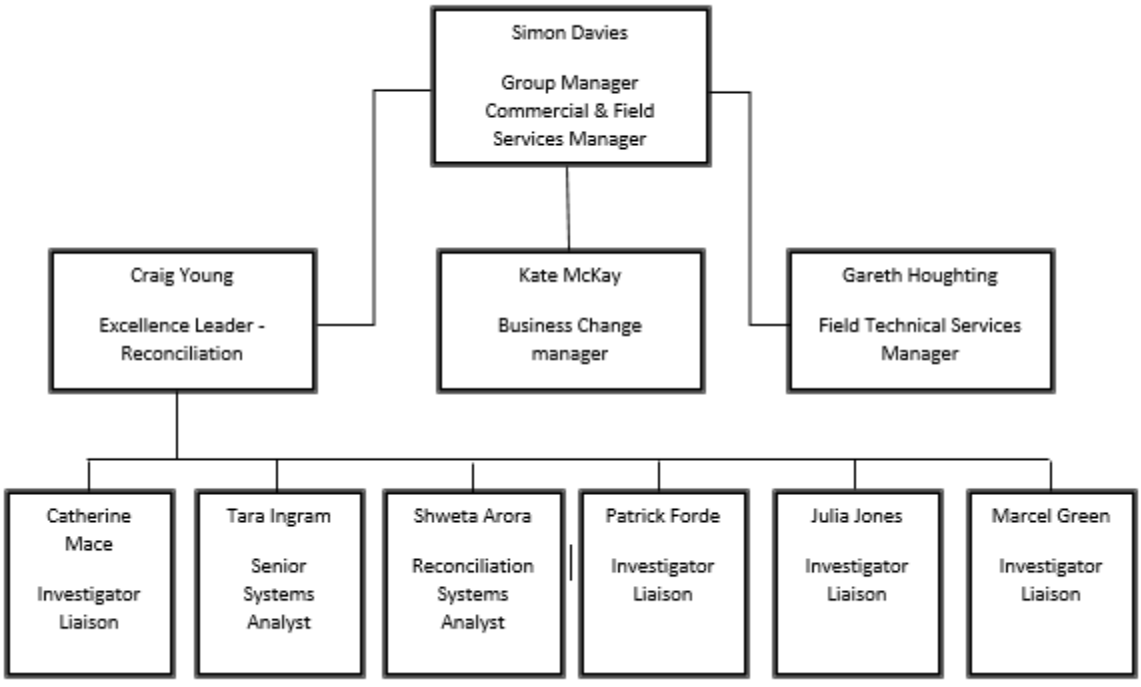
Section 11 of the Electricity Industry Act provides for the Electricity Authority to exempt any participant from compliance with all or any of the clauses.

### Audit commentary

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

## 1.2. Structure of Organisation

Genesis provided the relevant organisational structure:



## 1.3. Persons involved in this audit

Auditor:

| Name | Title |
|---|---|
| Rebecca Elliot | Auditor |

Other personnel assisting in this audit were:

| Name | Title | Company |
|---|---|---|
| Craig Young | Excellence Leader- Reconciliation | Genesis Energy |
| Aroha Arago-Kemp | Network GIS and Data Manager | Eastland |
| Jennette Moore | Billing and Revenue Assurance Manager | Eastland |
| Duncan Kerr | Database Support and Development | WSP |

## 1.4. Hardware and Software

The database used for reporting this DUML load will be RAMM from 1 June 2021. This is remotely hosted by RAMM Software Ltd. The specific module used for DUML is called "SLIMM" which stands for "Streetlighting Inventory Maintenance Management".

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

Systems used by the trader to calculate submissions 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

WDC had an ICP per streetlight circuit. Eastland is reducing this to be ICP 0009157081WWB0B for the one NSP that the streetlight load is connected to. The other ICPs are expected to be decommissioned. The details are set out below for reference:

| ICP Number | Description | NSP | Profile | Database wattage (watts) | No of items of load |
|---|---|---|---|---|---|
| 0009157081WWB0B | Wairoa DC | TUI1101 | NST | 48,883 | 816 |

NZTA lighting is recorded in the database, but this is being reconciled by NZTA in a separate RAMM database so is outside of the scope of this audit.

## 1.7. Authorisation Received

All information was provided directly by Genesis or Eastland or WDC.

## 1.8. Scope of Audit

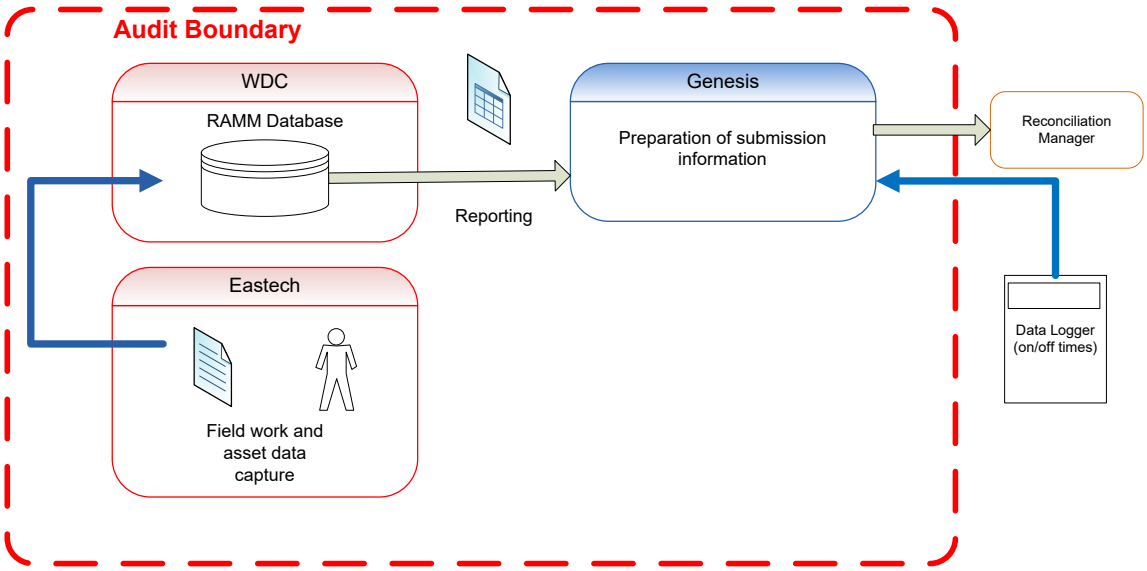
This audit of the WDC DUML database and processes was conducted at the request of Genesis, in accordance with clause 15.37B. The purpose of this audit is to verify that the volume information is being calculated accurately, and that profiles have been correctly applied

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

Previously the Eastland Streetlight Access database managed by Eastland was used to reconcile this load. WDC have been working with Eastland and Genesis to use the WDC RAMM database and this is expected to be used for reconciliation from 1st June 2021. Therefore, I have assessed the accuracy of the WDC RAMM database in this audit.

The NZTA lights previously associated with these lights are now reconciled by NZTA and will be subject to a separate audit with a different trader.

The diagram below shows the audit boundary for clarity.




The field audit of 182 items of load was carried out in Wairoa on 20 May 2021.

## 1.9. Summary of previous audit

The last audit report undertaken by Steve Woods of Veritek Limited in November 2020 was reviewed. The table below indicates the current status of that audit's findings.

## Table of Non-Compliance

| Subject | Section | Clause | Non-compliance | Status |
|---|---|---|---|---|
| Deriving submission information | 2.1 | 11(1) of Schedule 15.3 | The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.<br>In absolute terms, the total annual consumption is estimated to be 64,500 kWh lower than the DUML database indicates.<br>Under submission of approx. 2,118 kWh per annum has occurred due to incorrect wattage applied. | Still existing<br>Still existing<br>Still existing but is very minor over submission |
| Description and capacity | 2.4 | 11(2)c of Schedule 15.3 | Gear wattage is not recorded in the database. | Cleared |
| All load recorded in database | 2.5 | 11(2A) of Schedule 15.3 | Two additional lights found in the field. | Cleared |
| Database accuracy | 3.1 | 15.2 and 15.37B(b) | In absolute terms, total annual consumption is estimated to be 64,500 kWh lower than the DUML database indicates.<br>Ballast wattage is added outside the database.<br>There are several lamp wattage errors. | Still existing but much improved<br>Cleared<br>Still existing but very minor |
| Volume information accuracy | 3.2 | 15.2 and 15.37Bc | The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.<br>In absolute terms, the total annual consumption is estimated to be 64,500 kWh lower than the DUML database indicates.<br>Under submission of approx. 2,118 kWh per annum has occurred due to incorrect wattage applied. | Still existing<br>Still existing<br>Still existing but is very minor over submission |

## Table of Recommendations

| Subject | Section | Clause | Recommendation for Improvement | Status |
|---|---|---|---|---|
| | | | Nil | |

## 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 has 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 NST profile. The total volume submitted to the Reconciliation Manager is based on a monthly database report. This has been provided by Eastland, but Genesis will be moving to using the WDC RAMM database from 1 June 2021. The "burn time" is sourced from data loggers installed on the Eastland network. In this audit I have assessed the deriving of submission information against the Eastland dataset as RAMM is not currently being used. I have assessed the accuracy of the database in **section 3.1** against the RAMM database as this is what will be used for submission going forward.

I checked the submission calculations for May 2021 and confirmed they were correct.

The database is outside of the allowable +/-5% threshold. Overall, the database accuracy has improved by moving to from the Eastland database to the RAMM database. The change management controls have also strengthened as a result. However, there are historical data errors that are affecting the database accuracy and I recommend in **section 3.1**, that a full field audit is undertaken to correct these. In absolute terms, total annual consumption is estimated to be 25,200 kWh lower than the DUML database indicates.

Analysis of the RAMM database identified only five 125W Mercury Vapour lights with the incorrect ballast applied. This will be resulting in a very minor estimated over submission of 299 kWh per annum.

Reporting from Eastland has been provided as a snapshot of the database at the end of the month and this does not consider historic adjustments or the fact that lights can be livened before they are entered into the database. This is expected to improve with the use of the RAMM database. Genesis is working with Wairoa DC to provide a monthly report that will track changes at a daily level.

**Audit outcome**

Non-compliant

| Non-compliance | Description |
|---|---|
| Audit Ref: 2.1<br>With: Clause 11(1) of Schedule 15.3<br><br>From: 17-Nov-20<br>To: 31-May-21 | The database is outside of the allowable +/-5% threshold. In absolute terms, total annual consumption is estimated to be 25,200 kWh lower than the DUML database indicates.<br>5x 125W MV lights with the incorrect ballast applied resulting in a very minor estimated over submission of 299kWh per annum.<br>The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.<br>Potential impact: Medium<br>Actual impact: Medium<br>Audit history: Multiple times<br>Controls: Moderate<br>Breach risk rating: 4 |
| **Audit risk rating** | **Rationale for audit risk rating** |
| **Medium** | The controls are rated as moderate and mitigate risk most of the time but there is room for improvement.<br>The impact is assessed to be medium, based on the kWh differences described above. |

| Actions taken to resolve the issue | Completion date | Remedial action status |
|---|---|---|
| Genesis was provided data from Wairoa, however due to the ICP's not being populated Genesis required Eastland and the council to populate prior to being able to utilise. Eastland are to consolidate the assets and provide the ICP and assigned assets to the council for population. Genesis are working with the council to assist where possible. | 01/09/2021 | Identified |
| **Preventative actions taken to ensure no further issues will occur** | **Completion date** | |
| Continuation of providing feedback through exception reporting of asset information to the council | 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

WDC had an ICP per streetlight circuit. Eastland is reducing this to be ICP 0009157081WWB0B for the one NSP that the streetlight load is connected to. The other ICPs are expected to be decommissioned. The RAMM database has yet to have the ICP populated, but as all records relate to the one ICP this is a technical non-compliance only.

### Audit outcome

Non-compliant

| Non-compliance | Description |
|---|---|
| Audit Ref: 2.2<br>With: Clause 11(2)(a) and (aa) of Schedule 15.3<br><br>From: 17-Nov-20<br>To: 31-May-21 | ICP not yet recorded in the database.<br><br>Potential impact: None<br>Actual impact: None<br>Audit history: None<br>Controls: Strong<br>Breach risk rating:1 |
| **Audit risk rating** | **Rationale for audit risk rating** |
| **Low** | The controls are rated as strong as the ICP is being added to the database and this non-compliance is recorded due to timing.<br>The impact is assessed to be none but low is nearest audit risk rating available. |

| Actions taken to resolve the issue | Completion date | Remedial action status |
|---|---|---|
| Genesis was provided data from Wairoa, however due to the ICP's not being populated Genesis required Eastland and the council to populate prior to being able to utilise. Eastland are to consolidate the assets and provide the ICP and assigned assets to the council for population. Genesis are working with the council to assist where possible. | 01/09/2021 | Identified |
| **Preventative actions taken to ensure no further issues will occur** | **Completion date** | |
| Continuation of providing feedback through exception reporting of asset information to the council | Continuous improvement | |

## 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 the nearest street address, displacement value and pole numbers and Global Positioning System (GPS) coordinates for majority of items of load and users in the office and field can view these locations on a mapping system.

**Audit outcome**

Compliant

### 2.4. Description and capacity of load (Clause 11(2)(c) and (d) of Schedule 15.3)

**Code reference**

*Clause 11(2)(c) and (d) of Schedule 15.3*

**Code related audit information**

*The DUML database must contain:*

- *a description of load type for each item of load and any assumptions regarding the capacity*
- *the capacity of each item in watts.*

**Audit observation**

The database was checked to confirm that it contained a field for lamp type and wattage capacity and included any ballast or gear wattage and that each item of load had a value recorded in these fields.

**Audit commentary**

The database contains two records for wattage, firstly the lamp wattage and secondly the gear wattage, which represents ballast losses. Analysis of the database found no blank records. The accuracy of lamp description, wattage and gear wattage 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**

The field audit was undertaken of 182 items of load using the statistical sampling methodology.

**Audit commentary**

The field audit findings where discrepancies were found are detailed below:

| Street | Database count | Field count | Light count differences | Wattage recorded incorrectly | Comments |
|---|---|---|---|---|---|
| BILL NOLAN PLACE | 1 | 1 | - | 1 | 1x incorrect wattage recorded as 70W HPS but 27W LED found in the field |
| BRIAN AVENUE | 8 | 8 | - | 2 | 1x incorrect wattage recorded as 70W HPS but 26W LED found in the field<br>1x incorrect wattage recorded as 26W LED but 100W HPS found in the field. |
| CARROLL STREET (WAIROA) | 9 | 8 | -1 | 1 | 1x 70W HPS not found in the field.<br>1x incorrect wattage recorded as 18W LED but 29W LED found in the field. |
| FORTESQUE STREET (NORTH) | 3 | 3 | - | 2 | 1x incorrect wattage recorded as 26W LED but 18W LED found in the field<br>1x incorrect wattage recorded as 25W LED but 42W LED found in the field. |
| HUNTERBROWN STREET | 7 | 7 | - | 2 | 2x incorrect wattage recorded as 70W HPS but 18W LEDs found in the field. |
| KABUL STREET | 9 | 8 | -1 | | 1x 70W HPS not found in the field. |
| KAIMOANA STREET | 5 | 5 | - | 1 | 1x incorrect wattage recorded as 27W LED but 23W LED found in the field. |
| KIWI ROAD | 4 | 4 | - | 1 | 1x incorrect wattage recorded as 70W HPS but 18W LED found in the field. |
| MANSFIELD AVENUE | 3 | 3 | - | 1 | 1x incorrect wattage recorded as 70W HPS but 18W LED found in the field. |
| MOUNTAIN ROAD | 6 | 6 | | 1 | 1x incorrect wattage recorded as 70W HPS but 27W LED found in the field. |
| NEWCASTLE STREET | 16 | 15 | -1 | 4 | 1x 70W HPS not found in the field. |

| Street | Database count | Field count | Light count differences | Wattage recorded incorrectly | Comments |
|---|---|---|---|---|---|
| | | | | | 4x incorrect wattages found for a variety of lights. |
| RATA PLACE | 1 | 1 | - | 1 | 1x incorrect wattage recorded as 70W HPS but 18W LED found in the field. |
| RIVER PARADE (WEST) | 5 | 4 | -1 | - | 1x 18W LED not found in the field. |
| RUSSELL PARADE | 2 | 2 | - | 1 | 1x incorrect wattage recorded as 25W LED but 29W LED found in the field. |
| SPUR ROAD | 1 | 1 | - | 1 | 1x additional 27W LED found in the field. |
| STURDEE STREET | 5 | 5 | - | 2 | 2x incorrect wattages recorded as 100W HPS but 18W LED found in the field. |
| SYDNEY STREET | 5 | 5 | | 2 | 1x incorrect wattage recorded as 18W LED but 70W HPS found in the field<br>1x incorrect wattage recorded as 70W HPS but 18W LED found in the field. |
| TOROAIWHITI STREET | 1 | 0 | -1 | - | 1x 70W HPS not found in the field. |
| VALLEY ROAD | 9 | 9 | - | 2 | 1x incorrect wattage recorded as 18W LED but 27W LED found in the field<br>1x incorrect wattage recorded as 70W HPS but 18W LED found in the field. |
| WESTERN EXTENSION | 8 | 8 | - | 2 | 1x incorrect wattage recorded as 18W LED but 70W HPS found in the field<br>1x incorrect wattage recorded as 70W HPS but 18W LED found in the field. |
| WILLIAMS STREET | 3 | 3 | - | 1 | 1x incorrect wattage recorded as 25W LED but 29W LED found in the field. |
| **Grand Total** | **182** | **177** | **-5** | **28** | |

This clause relates to lights in the field not recorded in the database. No additional items of load were found in the field. The accuracy of the database is detailed in **section 3.1.**

**Audit outcome**

Compliant

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

**Code reference**

*Clause 11(3) of Schedule 15.3*

**Code related audit information**

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

**Audit observation**

The ability of the database to track changes was assessed and the process for tracking of changes in the database was examined.

**Audit commentary**

The RAMM database functionality achieves compliance with the code.

**Audit outcome**

Compliant

## 2.7. Audit trail (Clause 11(4) of Schedule 15.3)

**Code reference**

*Clause 11(4) of Schedule 15.3*

**Code related audit information**

*The 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 has a complete audit trail of all additions and changes to the database information.

**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 | Wairoa District Council |
| Strata | The database contains 816 items of load in the Wairoa District Council area and excludes NZTA lighting and any metered lights.<br>The processes for the management of items of load are the same, but I decided to place the items of load into four strata, as follows:<br>1. Road name A-C,<br>2. Road name D-L,<br>3. Road name M-O,<br>4. Road name P-Z |
| Area units | I created a pivot table of the ICP in each area and I used a random number generator in a spreadsheet to select a total of 45 sub-units. |
| Total items of load | 182 items of load were checked. |

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

The process to manage changes made in the field being updated in the database was examined.

#### Audit commentary

**Database accuracy based on the field audit**

A field audit was conducted of a statistical sample of 182 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 | 87.9 | Wattage from survey is lower than the database wattage by 12.1% |
| $R_L$ | 80.6 | With a 95% level of confidence, it can be concluded that the error could be between -6.1% and -19.4% |
| $R_H$ | 93.9 | |

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

The conclusion from Scenario B is that the variability of the sample results across the strata means that the true wattage (installed in the field) could be between 6.1% and 19.4% lower than the wattage recorded in the DUML database. Non-compliance is recorded because the potential error is greater than 5.0%.

In absolute terms the installed capacity is estimated to be 6.0 kW lower than the database indicates.

There is a 95% level of confidence that the installed capacity is between 3 kW and 9 kW lower than the database.

In absolute terms, total annual consumption is estimated to be 25,200 kWh lower than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 12,800 kWh p.a. to 40,500 kWh p.a. lower than the database indicates.

The errors found are historic and I recommend that a 100% field audit is undertaken to address these. I would expect the database accuracy to be within the allowable threshold if this were completed.

| Description | Recommendation | Audited party comment | Remedial action |
|---|---|---|---|
| Database Accuracy | 100% field audit is undertaken to correct historic errors. | Genesis will raise the recommendation with the council | Investigating |

| Scenario | Description |
|---|---|
| A - **Good accuracy, good precision** | This scenario applies if:<br>(a) $R_H$ is less than 1.05; and<br>(b) $R_L$ is greater than 0.95<br>The conclusion from this scenario is that:<br>(a) the best available estimate indicates that the database is accurate within +/- 5 %; and<br>(b) this is the best outcome. |
| B - **Poor accuracy, demonstrated with statistical significance** | This scenario applies if:<br>(a) the point estimate of R is less than 0.95 or greater than 1.05<br>(b) as a result, either $R_L$ is less than 0.95 or $R_H$ is greater than 1.05.<br>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:<br>(a) the point estimate of R is between 0.95 and 1.05<br>(b) $R_L$ is less than 0.95 and/or $R_H$ is greater than 1.05<br>The conclusion from this scenario is that the best available estimate is not precise enough to conclude that the database is accurate within +/- 5 % |

**Wattage and ballast accuracy findings**

The database contains two records for wattage, firstly the lamp wattage and secondly the gear wattage, which represents ballast losses.

The accuracy of the lamp description and the wattage was examined. 246 LED lights have no make or model recorded. This is recorded as non-compliance. All other lights had a lamp model that aligned with the lamp wattage applied.

Examination of the ballasts applied found that all LED lights had a blank ballast wattage. LED lights do not have any ballast associated so this has no impact on reconciliation, but I recommend that zero is populated.

| Description | Recommendation | Audited party comment | Remedial action |
|---|---|---|---|
| Database Accuracy | Populate zero ballast wattage for all LED lights | Genesis has already provided this feedback to the council and will follow up through Genesis energy's exception management controls. | Identified |

Five 125W Mercury Vapor lights were found to have a ballast of 25W applied instead of 11W. This will be resulting in a very minor estimated over submission of 299 kWh per annum.

**NZTA lighting**

NZTA lighting is recorded in the database, but this is being reconciled by NZTA in a separate RAMM database so is outside of the scope of this audit.

**ICP accuracy**

As detailed in **section 2.2**, the WDC ICP is still to be populated in the database. This is recorded as non-compliance.

**Location accuracy**

The database contains fields for the street address and also GPS coordinates. All items of load were locatable.

**Change management process findings**

All new streetlight circuits are required to be metered; therefore, the tracking of load changes is only relevant to the existing unmetered circuits. WDC have taken over the management of the streetlight database from 1st June 2021. As part of this process, WSP have been engaged to compare the data in WDC RAMM with that contained in the Eastland database. The field audit indicates that the database accuracy has improved but is still someway away from being within the required accuracy threshold as changes have not historically been tracked in either database. The database accuracy indicates that there is over submission occurring and therefore WDC will be being overbilled. I recommend a 100% field audit to correct this.

The change management process going forward is expected to improve as Eastland (as the contractor) will be updating the RAMM database as changes occur.

**Audit outcome**

Non-compliant

| Non-compliance | Description |
|---|---|
| Audit Ref: 3.1<br>With: Clause 15.2 and 15.37B(b)<br><br>From: 17-Nov-20<br>To: 31-May-21 | The database is outside of the allowable +/-5% threshold. In absolute terms, total annual consumption is estimated to be 25,200 kWh lower than the DUML database indicates.<br>246 LED lights with no make or model recorded.<br>5x 125W MV lights with the incorrect ballast applied resulting in a very minor estimated over submission of 299kWh per annum.<br>ICP still to be populated to the RAMM database.<br>Potential impact: Medium<br>Actual impact: Medium<br>Audit history: Multiple times<br>Controls: Strong<br>Breach risk rating: 2 |
| **Audit risk rating** | **Rationale for audit risk rating** |
| **Medium** | The controls are rated as strong going forward as the RAMM is expected to be updated directly as changes are made in the database.<br>The impact is assessed to be medium, based on the kWh differences described above. |

| Actions taken to resolve the issue | Completion date | Remedial action status |
|---|---|---|
| Eastland are to consolidate the assets and provide the ICP and assigned assets to the council for population. Genesis are working with the council to assist where possible. And will be providing the appropriate feedback in regard to correctly populating the lamp descriptions | 01/09/2021 | Identified |
| **Preventative actions taken to ensure no further issues will occur** | **Completion date** | |
| Continuation of providing feedback through exception reporting of asset information to the council | 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 burn hours against the submitted figure to confirm accuracy.

### Audit commentary

Genesis reconciles this DUML load using the NST profile. The total volume submitted to the Reconciliation Manager is based on a monthly database report. This has been provided by Eastland, but Genesis will be moving to using the WDC RAMM database from 1 June 2021. The "burn time" is sourced from data loggers installed on the Unison network. In this audit I have assessed the deriving of submission information against the Eastland dataset as RAMM is not currently being used. I have assessed the accuracy of the database in **section 3.1** against the RAMM database as this is what will be used for submission going forward.

I checked the submission calculations for May 2021 and confirmed they were correct.

The database is outside of the allowable +/-5% threshold. Overall, the database accuracy has improved by moving to from the Eastland database to the RAMM database. The change management controls have also strengthened as a result. However, there are historical data errors that are affecting the database accuracy and I recommend in **section 3.1**, that a full field audit is undertaken to correct these. In absolute terms, total annual consumption is estimated to be 25,200 kWh lower than the DUML database indicates.

Analysis of the RAMM database identified only five 125W Mercury Vapour lights with the incorrect ballast applied. This will be resulting in a very minor estimated over submission of 299 kWh per annum.

Reporting from Eastland has been provided as a snapshot of the database at the end of the month and this does not consider historic adjustments or the fact that lights can be livened before they are entered into the database. This is expected to improve with the use of the RAMM database. Genesis is working with Wairoa DC to provide a monthly report that will track changes at a daily level.

### Audit outcome

Non-compliant

| Non-compliance | Description |
|---|---|
| Audit Ref: 3.2<br>With: Clause 15.2 and 15.37B(c)<br><br><br><br><br><br><br>From: 17-Nov-20<br>To: 31-May-21 | The database is outside of the allowable +/-5% threshold. In absolute terms, total annual consumption is estimated to be 25,200 kWh lower than the DUML database indicates.<br>5x 125W MV lights with the incorrect ballast applied resulting in a very minor estimated over submission of 299kWh per annum.<br>The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.<br>Potential impact: Medium<br>Actual impact: Medium<br>Audit history: Multiple times<br>Controls: Moderate<br>Breach risk rating: 4 |
| **Audit risk rating** | **Rationale for audit risk rating** |
| **Medium** | The controls are rated as moderate and mitigate risk most of the time but there is room for improvement.<br>The impact is assessed to be medium, based on the kWh differences described above. |

| Actions taken to resolve the issue | Completion date | Remedial action status |
|---|---|---|
| Eastland are to consolidate the assets and provide the ICP and assigned assets to the council for population. Genesis are working with the council to assist where possible. And will be providing the appropriate feedback in regard to correctly populating the lamp descriptions | 01/09/2021 | Identified |
| **Preventative actions taken to ensure no further issues will occur** | **Completion date** | |
| Continuation of providing feedback through exception reporting of asset information to the council | Continuous improvement | |

## CONCLUSION

Previously the Eastland Streetlight Access database managed by Eastland was used to reconcile this load. WDC have been working with Eastland and Genesis to use the WDC RAMM and this is expected to be used for reconciliation from 1st June 2021. Therefore, I have assessed the accuracy of the WDC RAMM database in this audit.

However, submission volumes were assessed against the Eastland database as the RAMM database has yet to be used for submission.

NZTA lighting is recorded in the database, but this is being reconciled by NZTA in a separate RAMM database so is outside of the scope of this audit.

The RAMM database has a better level of accuracy than the Eastland Network database. The change management processes are also expected to improve as Eastland (as the contractor) will be updating RAMM directly as changes are made in the field. There are some historic data errors that need to be corrected to bring the database accuracy within the +/-5% allowable threshold. I have recommended that a full field audit is undertaken to correct this.

The audit found four non-compliances and two recommendations are made. The future risk rating of 11 is significant improvement from the score of 31 recorded in the last audit. This indicates that the next audit be completed in 12 months. This indicates that the next audit be completed in 12 months. I have considered this in conjunction with Genesis' comments and agree with this recommendation.

PARTICIPANT RESPONSE

Genesis are continuing to provide feedback to both the Council and Eastland to be able to move away from the Eastland data set to the RAMM information held by the customer. The process has been delayed which is why Genesis are late in providing the audit for submission as Genesis wanted to be able to confident in meeting timing associated with a compliance plan prior to acknowledging the findings in the audit. Genesis notes that the change in database already has removed a significant amount of risk and will continue to provide feedback to the council to assist in raising the accuracy level of the council database further.