# ELECTRICITY INDUSTRY PARTICIPATION CODE
# DISTRIBUTED UNMETERED LOAD AUDIT REPORT

For

## KAIPARA DISTRICT COUNCIL
## AND GENESIS ENERGY

Prepared by: Steve Woods

Date audit commenced: 8 December 2021

Date audit report completed: 11 January 2023

Audit report due date: 1 April 2022

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## EXECUTIVE SUMMARY

This audit of the **Kaipara District Council (KDC)** 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.

This audit found five non-compliances.

Streetlight load is determined by wattages held within KDC's RAMM database, and a monthly extract is provided to Genesis. Analysis of the December 2021 submission information found a discrepancy between the submission volume and the database resulting in an estimated annual over submission of 12,568 kWh.

Currie Electrical was appointed as the maintenance contractor in August 2021. The maintenance contract requires quarterly night inspections of pedestrian crossing lights, six monthly night inspection of all lights and an annual condition inspection of all lights. Currie Electrical update any changes directly in the database using RAMM Contractor.

There are 14 lamps with incorrect gear wattages recorded in the database. The incorrect capacities will be resulting in an estimated minor under submission of 533.875 kWh per annum (based on annual burn hours of 4,271 as is detailed in the DUML database auditing tool).

The field audit of 223 items of load could not confirm the database accuracy to be within the acceptable +/-5% accuracy threshold.

The future risk rating of 14 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 |
|---|---|---|---|---|---|---|---|
| DUML Audit | 1.10 | 16A.26 | Audit not completed within the timeframe specified by the Electricity Authority. | Moderate | Low | 2 | Cleared |
| Deriving submission information | 2.1 | 11(1) of Schedule 15.3 | A discrepancy between the submission volume and the database resulting in an estimated annual over submission of 12,568 kWh.<br>Database is not confirmed as accurate with a 95% level of confidence.<br>14 items of permanent load have the incorrect ballast applied indicating under submission of 533.875 kWh per annum. | Moderate | Medium | 4 | Identified |
| All load recorded in database | 2.5 | 11(2A) and (d) of Schedule 15.3 | 14 additional items of load found in the field sample. | Moderate | Low | 2 | Identified |
| Database accuracy | 3.1 | 15.2 and 15.37B(b) | Database is not confirmed as accurate with a 95% level of confidence.<br>14 items of permanent load have the incorrect ballast applied indicating under submission of 533.875 kWh per annum. | Moderate | Low | 2 | Identified |

| Subject | Section | Clause | Non-Compliance | Controls | Audit Risk Rating | Breach Risk Rating | Remedial Action |
|---|---|---|---|---|---|---|---|
| Volume information accuracy | 3.2 | 15.2 and 15.37B(c) | A discrepancy between the submission volume and the database resulting in an estimated annual over submission of 12,568 kWh.<br><br>Database is not confirmed as accurate with a 95% level of confidence.<br><br>14 items of permanent load have the incorrect ballast applied indicating under submission of 533.875 kWh per annum. | Moderate | Medium | 4 | Identified |
| 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 | Recommendation |
|---|---|---|
| | | Nil |

## 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

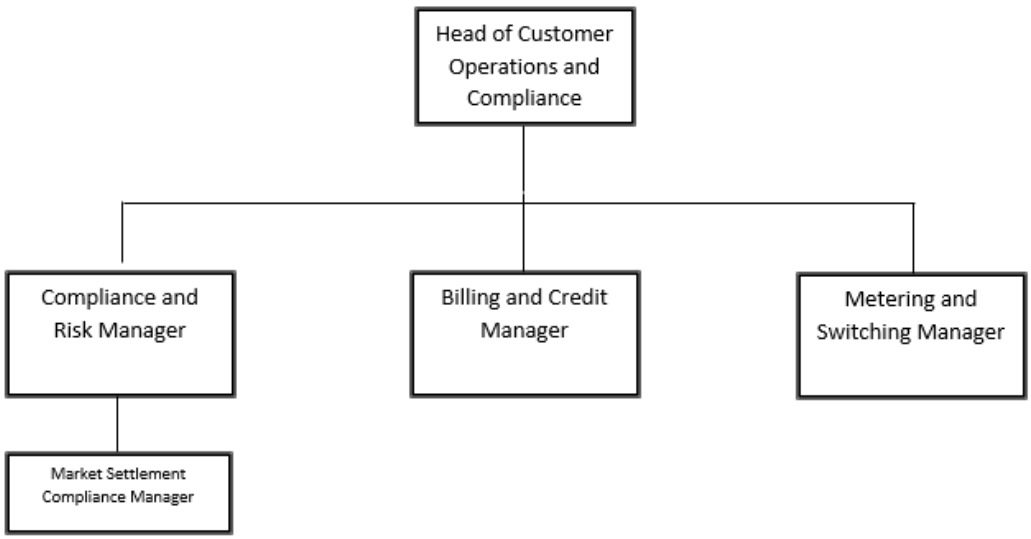
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

### Audit commentary

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

## 1.2. Structure of Organisation

Genesis provided the relevant organisational structure:



## 1.3. Persons involved in this audit

Auditor:

**Steve Woods**

**Veritek Limited**

**Electricity Authority Approved Auditor**

Supporting Auditor:

**Brett Piskulic**

**Veritek Limited**

**Electricity Authority Approved Auditor**

Other personnel assisting in this audit were:

| Name | Title | Company |
|---|---|---|
| Craig Young | Excellence Leader - Reconciliation | Genesis Energy |
| Nirav Teli | DUML Data & Stakeholder Lead | Genesis Energy |
| Jin Lin | Street lighting Services Specialist | Northland Transportation Alliance |
| Musheer Khan | Regional Operations Lead | Northland Transportation Alliance |

## 1.4. Hardware and Software

The SQL database used for the management of DUML is remotely hosted by thinkproject New Zealand Limited. The database is commonly known as "RAMM" which stands for "Road Assessment and Maintenance Management". The specific data used for DUML is held in the Streetlight tables. thinkproject New Zealand Limited backs up the database and assists with disaster recovery as part of their hosting service.

Access to the database is secure by way of password protection.

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

## 1.5. Breaches or Breach Allegations

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

## 1.6. ICP Data

| ICP Number | Description | NSP | Profile | Number of items of load | Database wattage (watts) |
|---|---|---|---|---|---|
| 0000545278NRC7A | Streetlights; Kaipara District Council | MPE1101 | NST | 582 | 28,207 |
| 0000545280NRE79 | Streetlights; Kaipara District Council | MTO0331 | NST | 659 | 23,079 |
| | | | TOTAL | 1,241 | 51,286 |

The ballast values are included in the wattage totals.

## 1.7. Authorisation Received

All information was provided directly by Genesis and KDC.

## 1.8. Scope of Audit

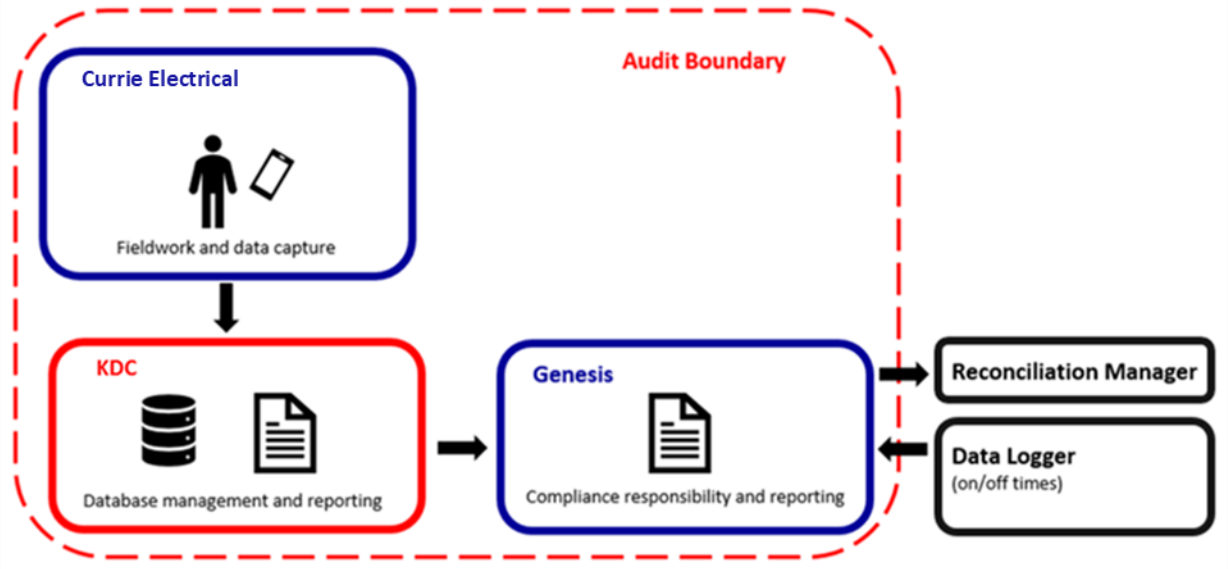
This audit of the **Kaipara District Council (KDC)** DUML database and processes was conducted at the request of **Genesis Energy Limited (Genesis)** in accordance with clause 15.37B. The purpose of this audit is to verify that the volume information is being calculated accurately, and that profiles have been correctly applied.

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

Kaipara District Council Unmetered Streetlights are located on the Northpower network. Genesis reconciles this load using the KDC RAMM streetlight database.

The scope of the audit encompasses the collection, security and accuracy of the data, including the preparation of submission information based on monthly reporting which are provided intermittently. The diagram below shows the flow of information and the audit boundary for clarity.

Field work is carried out by Currie Electrical under a maintenance contract which was put in place in August 2021.



The field audit was undertaken of a statistical sample of 223 items of load on 17th January 2022.

### 1.9. Summary of previous audit

The previous audit was completed in April 2021 by Steve Woods of Veritek Limited. The current status of that audit's findings is detailed below:

## Table of Non-Compliance

| Subject | Section | Clause | Non-compliance | Status |
|---|---|---|---|---|
| Deriving submission information | 2.1 | 11(1) of Schedule 15.3 | A discrepancy between the submission volume and the database resulting in an estimated annual over submission of 13,054.7kWh.<br>Database is not confirmed as accurate with a 95% level of confidence.<br>18 items of permanent load have the incorrect ballast applied indicating a minor under submission of 768.78 kWh per annum.<br>797 LED lights with incorrect wattage applied indicating over submission of 3,744.39 kWh per annum. | Still existing<br>Still existing<br>Still existing<br>Cleared |
| Database accuracy | 3.1 | 15.2 and 15.37B(b) | Database is not confirmed as accurate with a 95% level of confidence.<br>18 items of permanent load have the incorrect ballast applied indicating under submission of 768.78 kWh per annum.<br>797 LED lights with incorrect wattage applied indicating over submission of 3,744.39 kWh per annum. | Still existing<br>Still existing<br>Cleared |
| Volume information accuracy | 3.2 | 15.2 and 15.37B(c) | A discrepancy between the submission volume and the database resulting in an estimated annual over submission of 13,054.7kWh.<br>Database is not confirmed as accurate with a 95% level of confidence.<br>18 items of permanent load have the incorrect ballast applied indicating under submission of 768.78 kWh per annum.<br>797 LED lights with incorrect wattage applied indicating over submission of 3,744.39 kWh per annum. | Still existing<br>Still existing<br>Still existing<br>Cleared |

## Table of Recommendations

| Subject | Section | Recommendation for Improvement | Status |
|---|---|---|---|
| Database Accuracy | 3.1 | Confirm LED light wattages by obtaining manufacturers specifications. | Cleared |

## 1.10. Distributed unmetered load audits (Clause 16A.26)

### Code reference

*Clause 16A.26*

### 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. The audit was not able to be completed by the required timeframe as the submission information was not provided by the due date.

### Audit outcome

Compliant

| Non-compliance | Description |
|---|---|
| Audit Ref: 1.10<br>With: Clause 16A.26<br><br><br><br>From: 20-Feb-22<br>To: 11-Jan-23 | Audit not completed within the timeframe specified by the Electricity Authority.<br>Potential impact: Low<br>Actual impact: Low<br>Audit history: None<br>Controls: Moderate<br>Breach risk rating: 2 |
| **Audit risk rating** | **Rationale for audit risk rating** |
| **Low** | The controls are rated as moderate, as Genesis have made changes to ensure that information will be provided in future.<br>The impact is assessed to be low, as this has no direct impact on reconciliation. |

| Actions taken to resolve the issue | Completion date | Remedial action status |
|---|---|---|
| Genesis Energy has appointment a DUML Data & Stakeholder Lead to provide information and avoid delays | 10/01/2023 | Cleared |
| **Preventative actions taken to ensure no further issues will occur** | **Completion date** | |
| Genesis Energy has appointment a DUML Data & Stakeholder Lead to provide information and avoid delays | 10/01/2023 | |

## 2. DUML DATABASE REQUIREMENTS

### 2.1. Deriving submission information (Clause 11(1) of Schedule 15.3)

**Code reference**

*Clause 11(1) of Schedule 15.3*

**Code related audit information**

*The retailer must ensure the:*

- *DUML database is up to date,*
- *methodology for deriving submission information complies with Schedule 15.5.*

**Audit observation**

The process for calculation of consumption was examined.

**Audit commentary**

Genesis reconciles this DUML load using the NST profile.

Genesis is reconciling the load using the KDC RAMM streetlight database. The total volume submitted to the Reconciliation Manager is based on the most recently received database report provided by KDC.

I compared the submission volumes with the load recorded in the database extract provided in December 2021 for this audit against the volumes submitted by Genesis for December 2021. The following variances were found:

| ICPs | Fittings number from December 2021 submission | Fittings number from 13th Dec 2021 database extract | Difference | kWh value submitted | Calculated kWh value from database | kWh difference |
|---|---|---|---|---|---|---|
| 0000545278NRC7A | 595 | 582 | +13 | 9,388 | 8,405.63 | 982.37 over submission |
| 0000545280NRE79 | 640 | 659 | -19 | 6,772 | 6,877.50 | 105.50 under submission |
| | | | | | Total | 876.87 over submission |

Annualised this will result in an estimated annual over submission of 12,568 kWh.

The field audit against the database quantities found that the database is not confirmed as accurate with a 95% level of confidence. This is detailed in **section 3.1**.

As noted in **section 3.1**, I checked the ballasts being applied and found that 14 lamps had a discrepancy when compared to the standardised wattage table. The incorrect capacities will be resulting in an estimated minor under submission of 533.875 kWh per annum (based on annual burn hours of 4,271 as is detailed in the DUML database auditing tool).

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.

KDC provides a monthly report of changes made along with the monthly wattage report. Genesis then accounts for changes which have happened in each month on a daily basis.

**Audit outcome**

Non-compliant

| Non-compliance | Description |
|---|---|
| Audit Ref: 2.1<br>With: Clause 11(1) of Schedule 15.3<br><br>From: 01-Apr-21<br>To: 17-Jan-22 | A discrepancy between the submission volume and the database resulting in an estimated annual over submission of 12,568 kWh.<br>Database is not confirmed as accurate with a 95% level of confidence.<br>14 items of permanent load have the incorrect ballast applied indicating under submission of 533.875 kWh per annum.<br>Potential impact: Medium<br>Actual impact: Medium<br>Audit history: Once<br>Controls: Moderate<br>Breach risk rating: 4 |
| **Audit risk rating** | **Rationale for audit risk rating** |
| **Medium** | The controls are rated as moderate as they will mitigate risk most of the time but there is room for errors to occur.<br>The impact is assessed to be medium due to the kWh volumes. |

| Actions taken to resolve the issue | Completion date | Remedial action status |
|---|---|---|
| Genesis has requested a full dataset for December 2021 and will revise volumes submitted accordingly.<br>Genesis has reviewed the auditors finding and have advised KDC of the discrepancy with the intent that KDC makes every effort to ensure the exceptions are rectified. | 31/03/2023 | Identified |
| **Preventative actions taken to ensure no further issues will occur** | **Completion date** | |
| Genesis continues to work with the council to increase accuracy levels in their database. | 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 the correct ICP was recorded against each item of load.

**Audit commentary**

All items of load had an ICP 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 road name, location number, pole ID, and GPS coordinates.

GPS coordinates are populated for all except two items of load.

**Audit outcome**

Compliant

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

**Code reference**

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

**Code related audit information**

*The DUML database must contain:*

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

**Audit observation**

The database was checked to confirm that it contained a field for lamp type and wattage capacity and included any ballast or gear wattage.

**Audit commentary**

The database contains fields for lamp make and model. There are three fields which record lamp wattage, gear wattage and total wattage including gear and lamp wattage.

The accuracy of lamp descriptions, wattages and ballasts is recorded 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 a statistical sample of 223 items of load on 17th January 2022.

### Audit commentary

The field audit discrepancies found are detailed in the table below.

| Street | Database count | Field count | Light count differences | Wattage recorded incorrectly | Comments |
|---|---|---|---|---|---|
| Moir Point Road, Mangawhai | 22 | 18 | -4 | - | 18 x 21W LEDs in field, 22 x 21W LEDs recorded in database. |
| Estuary Drive, Mangawhai | 6 | 19 | +13 | - | 13 additional LEDs found in field which are not recorded in the database. |
| William Gilbert Drive RAB, Mangawhai | 1 | 1 | - | 1 | 1 x 21W LED found in field, recorded as 0W in database. |
| William Gilbert Drive, Mangawhai | 6 | 6 | - | 6 | 6 x 21W LEDs found in field, recorded as 0W in database. |
| Settlement Road, Kaiwaka | 4 | 5 | +1 | - | 1x additional 70W HPS found in the field. |
| Kaiwaka Domain Access Road | 1 | 0 | -1 | - | 1x 21W LED not found in field. |
| Kaiwaka Domain Carpark | 1 | 0 | -1 | - | 1x 21W LED not found in field. |
| **Grand Total** | **223** | **231** | **20 (+14, -6)** | **7** | |

This clause relates to lights in the field that are not recorded in the database. I found an additional 14 lamps in the field that were not recorded in the database. The database accuracy is discussed in **section 3.1**.

### Audit outcome

Non-compliant

| Non-compliance | Description |
|---|---|
| Audit Ref: 2.5<br>With: Clause 11(2A) and (d) of Schedule 15.3<br><br>From: unknown<br>To: 17-Jan-22 | 14 additional items of load found in the field sample.<br>Potential impact: High<br>Actual impact: Low<br>Audit history: Once<br>Controls: Moderate<br>Breach risk rating: 2 |
| **Audit risk rating** | **Rationale for audit risk rating** |
| **Low** | The controls are rated as moderate due to the volume of additional lights found in the field.<br>The impact is assessed to be low due to the low number of differences found in the field and total estimated kWh difference detailed in **section 3.1**. |

| Actions taken to resolve the issue | Completion date | Remedial action status |
|---|---|---|
| Genesis has advised KDC of the discrepancy. KDC has updated RAMM database for some of the assets and is organising for a contractor to carry out a site inspection to ascertain luminaire wattage so RAMM can be updated accordingly. | 31/03/2023 | Identified |
| **Preventative actions taken to ensure no further issues will occur** | **Completion date** | |
| Genesis continues to work with the council to increase accuracy levels in their database. | Continuous Improvement | |

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

### Code reference

*Clause 11(3) of Schedule 15.3*

### Code related audit information

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

### Audit observation

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

### Audit commentary

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

### Audit outcome

Compliant

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

**Code reference**

*Clause 11(4) of Schedule 15.3*

**Code related audit information**

*The DUML database must incorporate an audit trail of all additions and changes that identify:*

- *the before and after values for changes*
- *the date and time of the change or addition*
- *the person who made the addition or change to the database.*

**Audit observation**

The database was checked for audit trails.

**Audit commentary**

The KDC RAMM database has an 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**

A database extract was provided, and I assessed the accuracy of this by using the DUML Statistical Sampling Guideline. The table below shows the survey plan.

| Plan Item | Comments |
|---|---|
| Area of interest | Kaipara District Council area |
| Strata | The database contains the KDC items of load in two ICPs in the Kaipara region area.<br>The processes for the management of all KDC items of load are the same, but I decided to place the items of load into four strata:<br>1. Dargaville (streets A-M) and Poutu,<br>2. Dargaville (streets N-Z), Aranga, Mangatu, Pukehuia and Tangowahine,<br>3. Mangawhai,<br>4. Kaiwaka, Matakohe, Maungaturoto and Ruawai. |
| 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 60 sub-units (roads). |
| Total items of load | 223 items of load were checked. |

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

**Audit commentary**

**Field Audit Findings**

A field audit was conducted of a statistical sample of 223 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 | 104.8 | Wattage from survey is higher than the database wattage by 4.8% |
| $R_L$ | 98.1 | With a 95% level of confidence, it can be concluded that the error could be between -1.9% and 15.9% |
| $R_H$ | 115.9 | |

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 C (detailed below) applies.

The conclusion from Scenario C is that the variability of the sample results across the strata means that the true wattage (installed in the field) could be between 1.9% lower and 15.9% higher than the wattage recorded in the DUML database. Non-compliance is recorded because the potential error is greater than 5.0%.

In absolute terms the installed capacity is estimated to be 2 kW higher than the capacity indicated by the database.

There is a 95% level of confidence that the installed capacity is between 1.0 kW lower to 8 kW higher than the database.

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

There is a 95% level of confidence that the annual consumption is between 4,200 kWh p.a. lower to 34,900 kWh p.a. higher than the database indicates.

| **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**

I checked the ballasts being applied and found that 14 lamps had a discrepancy when compared to the standardised wattage table. This is detailed in the table below:

| Lamp Type | Database Total Lamp Wattage | EA Standardised Total Wattage | Variance (watts) | Database Quantity | Estimated Annual kWh effect on consumption |
|---|---|---|---|---|---|
| 70W HPSV Lamp | 70 | 83 | -13 | 9 | -499.707 kWh |
| 70W HPSV Lamp | 88 | 83 | +5 | 2 | +42.71 kWh |
| 100W HPSV Lamp | 100 | 114 | -14 | 2 | -119.588 kWh |
| 150W HPSV Lamp | 178 | 168 | +10 | 1 | +42.71 kWh |
| Total estimated annual effect on submission | | | | | - 533.875 kWh |

The incorrect capacities will be resulting in an estimated under submission of 533.875 kWh per annum (based on annual burn hours of 4,271 as is detailed in the DUML database auditing tool).

I reviewed the LED light descriptions to confirm if the wattages applied were correct. The most common LED light used is the AEC I-Tron Zero STA4.49-2M. The last audit recorded non-compliance as the wattage applied in the database of 21 watts differed from a manufacturers specification document which indicated that the correct wattage for these lights is 19.9 watts. KDC provided the results of an investigation and testing carried out which confirmed that the correct wattage is 21 watts as recorded in the database.

**Change management process findings**

The RAMM database used for submission is managed by KDC. The processes to track load changes due to faults and maintenance were examined. Currie Electrical was appointed as the maintenance contractor in August 2021. The maintenance contract requires quarterly night inspections of pedestrian crossing lights, six monthly night inspection of all lights and an annual condition inspection of all lights. Currie Electrical update any changes directly in the database using RAMM Contractor.

The processes for new lamp connections were examined. “As-built” plans are expected to be submitted to KDC as part of this process. The new lights are recorded in the database from the date of vesting as advised by the installation contractor. A site visit is conducted to confirm the accuracy of the details recorded in RAMM.

There are no festive lights connected to the unmetered streetlight circuits. Private lights are not held in the database.

**Audit outcome**

Non-compliant

| Non-compliance | Description |
|---|---|
| Audit Ref: 3.1<br>With: Clause 15.2 and 15.37B(b)<br><br><br><br>From: 01-Apr-21<br>To: 17-Jan-22 | Database is not confirmed as accurate with a 95% level of confidence.<br>14 items of permanent load have the incorrect ballast applied indicating under submission of 533.875 kWh per annum.<br>Potential impact: Low<br>Actual impact: Low<br>Audit history: Multiple times<br>Controls: Moderate<br>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.<br>The impact is assessed to be low due to the impact on submission. |

| Actions taken to resolve the issue | Completion date | Remedial action status |
|---|---|---|
| Genesis has reviewed the auditors finding and have advised KDC of the discrepancy. KDC has confirmed that standardised wattage has been updated in RAMM for the 14 highlighted items. | 10/01/2023 | Identified |
| **Preventative actions taken to ensure no further issues will occur** | **Completion date** | |
| Genesis continues to work with the council to increase accuracy levels in their database. | 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 all ICPs have the correct profile and submission flag, and
- checking the database extract combined with the burn hours against the submitted figure to confirm accuracy.

### Audit commentary

Genesis reconciles this DUML load using the NST profile.

The total volume submitted to the Reconciliation Manager is based on the most recently received database report provided by KDC. As detailed in **section 2.1**, the database extract did not match the volumes submitted by Genesis resulting in an over submission of 876.87 kWh for the month of December 2021. Annualised this will result in an estimated annual over submission of 12,568 kWh.

As noted in **section 3.1**, there are 14 lamps with incorrect gear wattages recorded in the database. The incorrect capacities will be resulting in an estimated under submission of 533.875 kWh per annum (based on annual burn hours of 4,271 as is detailed in the DUML database auditing tool).

The field audit against the database quantities found that the database is not confirmed as accurate with a 95% level of confidence. This is detailed 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.

KDC provides a monthly report of changes made along with the monthly wattage report. Genesis then accounts for changes which have happened in each month on a daily basis.

**Audit outcome**

Non-compliant

<table>
<tr><th>Non-compliance</th><th colspan="3">Description</th></tr>
<tr><td>Audit Ref: 3.2<br>With: Clause 15.2 and 15.37B(c)<br><br><br><br><br>From: 01-Apr-21<br>To: 17-Jan-22</td><td colspan="3">A discrepancy between the submission volume and the database resulting in an estimated annual over submission of 12,568 kWh.<br>Database is not confirmed as accurate with a 95% level of confidence.<br>14 items of permanent load have the incorrect ballast applied indicating under submission of 533.875 kWh per annum.<br><br>Potential impact: Medium<br>Actual impact: Medium<br>Audit history: Multiple times<br>Controls: Moderate<br>Breach risk rating: 4</td></tr>
<tr><th>Audit risk rating</th><th colspan="3">Rationale for audit risk rating</th></tr>
<tr><td>Medium</td><td colspan="3">The controls are rated as moderate as they will mitigate risk most of the time but there is room for errors to occur.<br>The impact is assessed to be medium due to the kWh volumes.</td></tr>
<tr><th colspan="2">Actions taken to resolve the issue</th><th>Completion date</th><th>Remedial action status</th></tr>
</table>

| | | |
|---|---|---|
| Genesis has requested a full dataset for December 2021 and will revise volumes submitted accordingly.<br>Genesis has reviewed the auditors finding and have advised KDC of the discrepancy with the intent that KDC makes every effort to ensure the exceptions are rectified. | 31/03/2023 | Identified |
| **Preventative actions taken to ensure no further issues will occur** | **Completion date** | |
| Genesis continues to work with the council to increase accuracy levels in their database. | 31/03/2023 | |

## CONCLUSION

This audit found five non-compliances.

Streetlight load is determined by wattages held within KDC's RAMM database, and a monthly extract is provided to Genesis. Analysis of the December 2021 submission information found a discrepancy between the submission volume and the database resulting in an estimated annual over submission of 12,568 kWh.

Currie Electrical was appointed as the maintenance contractor in August 2021. The maintenance contract requires quarterly night inspections of pedestrian crossing lights, six monthly night inspection of all lights and an annual condition inspection of all lights. Currie Electrical update any changes directly in the database using RAMM Contractor.

There are 14 lamps with incorrect gear wattages recorded in the database. The incorrect capacities will be resulting in an estimated minor under submission of 533.875 kWh per annum (based on annual burn hours of 4,271 as is detailed in the DUML database auditing tool).

The field audit of 223 items of load could not confirm the database accuracy to be within the acceptable +/-5% accuracy threshold.

The future risk rating of 14 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 has reviewed the auditors finding and have advised KDC of the discrepancy with the intent that KDC makes every effort to ensure the exceptions are rectified. Genesis continues to build on their relationship with the council and increase accuracy levels in their database.

KDC has updated RAMM for some of the discrepancies highlighted by the auditor and has organised for a contractor to carry out a site inspection to ascertain the luminaire wattage and the same will be updated in RAMM database accordingly.