# ELECTRICITY INDUSTRY PARTICIPATION CODE
# DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

## STRATFORD DISTRICT COUNCIL
## AND GENESIS ENERGY LIMITED

Prepared by: Rebecca Elliot

Date audit commenced: 16 August 2021

Date audit report completed: 24 September 2021

Audit report due date: 1 October 2021

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## EXECUTIVE SUMMARY

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

The audit was conducted in accordance with the audit guidelines for DUML audits version 1.1. The scope of the audit encompasses the collection, security and accuracy of the data, including the preparation of submission information.

A RAMM database is held by SDC, who is Genesis' customer. NPE Tech are responsible for fault, maintenance, and upgrade work for streetlights, and maintain the database. This contract will be out for tender in the next six months.

The NZTA lighting load should no longer being reconciled from this database from 1 June 2021. This load is in the process of being removed so submission for the NZTA streetlight load will have been submitted twice from June 2021 to September 2021. This will have resulted in an estimated over submission of 49,635 kWh. Genesis will correct this via the revision process.

Many of the database issues identified in the last audit were attributed to the NZTA lighting load and therefore the overall accuracy of the remaining items of load is high with robust processes in place to manage these.

The field audit found a small number of lighting discrepancies which has resulting in the database falling just outside the allowable threshold of +/-5%:

- In absolute terms the installed capacity is estimated to be the same as the database indicates.
- In absolute terms, total annual consumption is estimated to be 1,500 kWh higher than the DUML database indicates.
- There is a 95% level of confidence that the annual consumption is between 1700 kWh p.a. lower to 4,900 kWh p.a. higher than the database indicates.

The audit found five non-compliances, and one recommendation is made. The future risk rating of 17 indicates that the next audit be completed in six months. I have considered this in conjunction with Genesis' comments and:

- the issue of submission occurring twice for the same load is being corrected by Genesis via the revision process, and
- overall, the processes in place to manage the database accuracy are robust with some minor fixes needed to move controls to strong.

Therefore, I recommend that the next audit be in nine months time.

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 | Estimated over submission of 49,635 kWh for the NZTA lights that were being reconciled in the SDC and NZTA RAMM database.<br><br>Ten unmetered decorative lights are not recorded in RAMM. This may result in estimated under submission of 1,700W or 726 kWh p.a.<br><br>Eight unmetered Christmas lights are not recorded in RAMM. This may result in estimated under submission of 120 W or 50.4 kWh p.a.<br><br>The database is outside of the allowable +/-5% threshold. In absolute terms, total annual consumption is estimated to be 1,500 kWh higher than the DUML database indicates.<br><br>The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. | Moderate | High | 6 | Identified |
| Description and capacity of load | 2.4 | 11(2)(c) and (d) of Schedule 15.3 | One light has an unknown lamp model, and a missing lamp wattage and gear wattage. | Strong | Low | 1 | Identified |
| All load recorded in database | 2.5 | 11(2A) of Schedule 15.3 | Four additional lights found in the field from the sample of 154 lights checked.<br><br>Ten unmetered decorative lights are not recorded in RAMM. This may result in estimated under submission of 1,700W or 726 kWh p.a.<br><br>Eight unmetered Christmas lights are not recorded in RAMM. | Moderate | Low | 2 | Identified |
| Database accuracy | 3.1 | 15.2 and 15.37B(b) | The database is outside of the allowable +/-5% threshold. In absolute terms, total annual | Moderate | Low | 2 | Identified |

| Subject | Section | Clause | Non-Compliance | Controls | Audit Risk Rating | Breach Risk Rating | Remedial Action |
|---|---|---|---|---|---|---|---|
| | | | consumption is estimated to be 1,500 kWh higher than the DUML database indicates.<br><br>Ten unmetered decorative lights are not recorded in RAMM. This may result in estimated under submission of 1,700W or 726 kWh p.a.<br><br>Eight unmetered Christmas lights are not recorded in RAMM. This may result in estimated under submission of 120 W or 50.4 kWh p.a. | | | | |
| Volume information accuracy | 3.2 | 15.2 and 15.37B(c) | Estimated over submission of 49,635 kWh for the NZTA lights that were being reconciled in the SDC and NZTA RAMM database.<br><br>Ten unmetered decorative lights are not recorded in RAMM. This may result in estimated under submission of 1,700W or 726 kWh p.a.<br><br>Eight unmetered Christmas lights are not recorded in RAMM. This may result in estimated under submission of 120 W or 50.4 kWh p.a.<br><br>The database is outside of the allowable +/-5% threshold. In absolute terms, total annual consumption is estimated to be 1,500 kWh higher than the DUML database indicates.<br><br>The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. | Moderate | High | 6 | Identified |
| Future Risk Rating | | | | | | 17 | |

| 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 |
|---|---|---|
| Christmas and decorative lights | 2.5 | Add the Christmas and decorative lights to RAMM. Communicate on and off dates for Christmas lights to Genesis. |

## 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

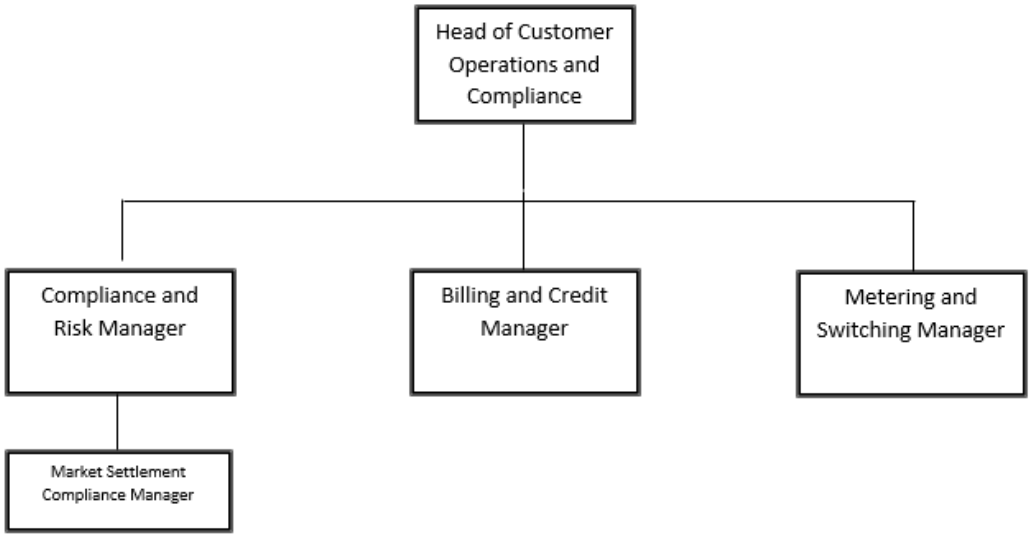
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

### 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

Auditors:

| Name | Company | Role |
|---|---|---|
| Rebecca Elliot | Veritek Limited | Lead Auditor |
| Steve Woods | Veritek Limited | Supporting Auditor |

Other personnel assisting in this audit were:

| Name | Title | Company |
|---|---|---|
| Vivek Regmi | G. Roading Engineer | Stratford District Council |
| Craig Young | Rubiks Business Service Owner – Market Settlements and interactions | Genesis |
| Julia Jones | DUML Data & Stakeholder Lead - Market Settlement Compliance | Genesis |

## 1.4. Hardware and Software

The SQL database used for the management of DUML is remotely hosted by thinkproject New Zealand Limited (formerly RAMM NZ Ltd). The database is commonly known as "RAMM" which stands for "Roading Asset and Maintenance Management". The specific module used for DUML is called RAMM Contractor.

thinkproject New Zealand Limited backs up the database and assists with disaster recovery as part of their hosting service. Nightly backups are performed. As a minimum, daily backups are retained for the previous five working days, weekly backups are retained for the previous four weeks, and monthly backups are retained for the previous six months.

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) |
|---|---|---|---|---|---|
| 0089352004PCE32 | STRATFORD DISTRICT DRAWING 9807 | SFD0331 | NST | 730 | 19,097 |

The NZTA lights are in the process of being removed from this database and will be reconciled in the NZTA RAMM database. This affects all assets associated with ICPs 0080012045PC49C, 0089352001PC37D and 1000544328PCC4B. NZTA have liaised with Powerco and created one ICP per NSP. The SDC NZTA lights are now recorded under ICP 1000592743PC8FF. The three SDC ICPs with the NZTA items of load associated will need to be decommissioned. This change is effective from 1 June 2021. Submission in relation to this change is discussed in **sections 2.1** and **3.2**.

### 1.7. Authorisation Received

All information was provided directly by Genesis or SDC.

### 1.8. Scope of Audit

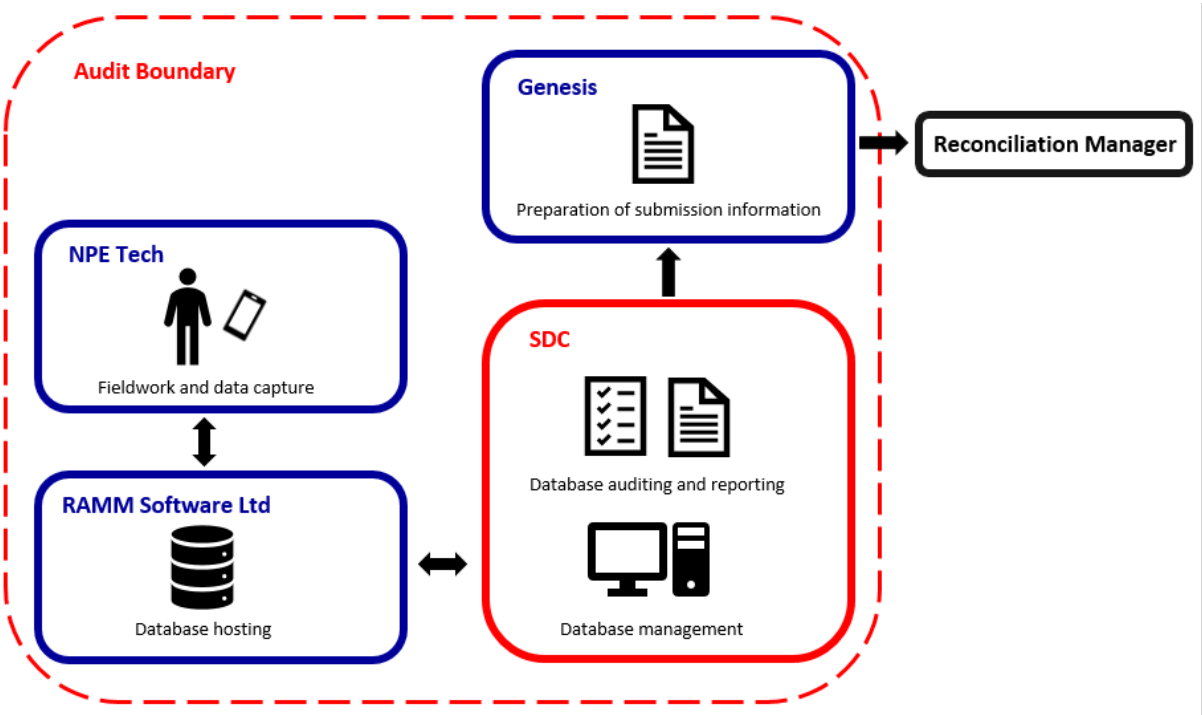
This audit of the SDC DUML database and processes was conducted at the request of Genesis in accordance with clause 15.37B. The purpose of this audit is to verify that the volume information is being calculated accurately, and that profiles have been correctly applied.

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

A RAMM database is held by SDC, who is Genesis' customer. NPE Tech are responsible for fault, maintenance, and upgrade work for streetlights, and maintain the database.

A monthly report from the database is provided to Genesis by SDC, which is used to calculate submissions. Genesis reconciles the DUML load as NHH using the NST profile. Submission on and off times are derived from data logger information. Prior to February 2020, Astronomical Society data was used to determine on and off times. Genesis has submitted revised submission information using the data logger hourss.

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.




The field audit was undertaken of a statistical sample of 154 items of load on 20 September 2021.

## 1.9. Summary of previous audit

The previous audit of this database was undertaken by Tara Gannon of Veritek Limited in March 2020. The summary table below shows the statuses of the non-compliances raised in the previous audit. Further comment is made in the relevant sections of this report.

### Table of Non-compliance

| Subject | Section | Clause | Non-compliance | Status |
|---|---|---|---|---|
| Deriving submission information | 2.1 | 11(1) of Schedule 15.3 | One light (light ID 1786) has an unknown lamp model, and a missing lamp wattage and gear wattage, which could result in potential under submission of 354.5 kWh per annum. | Relates to NZTA |
| | | | One light (light ID 118) has a missing gear wattage, which could result in an unknown amount of under submission. | Relates to NZTA |
| | | | A further 200 lights have incorrect gear (total) wattages recorded, including the lamps with missing and invalid zero gear wattages. This may result in under reporting of 2,308 W or 9,857 kWh p.a. based on 4,271 annual burn hours. | Relates to NZTA |
| | | | Ten unmetered decorative lights are not recorded in RAMM. This may result in estimated under submission of 1,700W or 726 kWh p.a. | Still existing |
| | | | Eight unmetered Christmas lights are not recorded in RAMM. This may result in estimated under submission of 120 W or 50.4 kWh p.a. | Still existing |
| | | | The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. | Still existing |
| Description and capacity of load | 2.4 | 11(2)(c) and (d) of Schedule 15.3 | One light (light ID 1786) has an unknown lamp model, and a missing lamp wattage and gear wattage.<br>One light (light ID 118) has a missing gear wattage. | Still existing for different light |
| All load recorded in database | 2.5 | 11(2A) of Schedule 15.3 | Ten unmetered decorative lights are not recorded in RAMM. This may result in estimated under submission of 1,700W or 726 kWh p.a.<br>Eight unmetered Christmas lights are not recorded in RAMM. This may result in estimated under submission of 120 W or 50.4 kWh p.a. | Still existing |

| Subject | Section | Clause | Non-compliance | Status |
|---|---|---|---|---|
| Database accuracy | 3.1 | 15.2 and 15.37B(b) | One light (light ID 1786) has an unknown lamp model, and a missing lamp wattage and gear wattage, which could result in potential under submission of 354.5 kWh per annum. | Relates to NZTA |
| | | | One light (light ID 118) has a missing gear wattage, which could result in an unknown amount of under submission. | Relates to NZTA |
| | | | A further 200 lights have incorrect gear (total) wattages recorded, including the lamps with missing and invalid zero gear wattages. This may result in under reporting of 2,308 W or 9,857 kWh p.a. based on 4,271 annual burn hours. | Relates to NZTA |
| | | | Ten unmetered decorative lights are not recorded in RAMM. This may result in estimated under submission of 1,700W or 726 kWh p.a. | Still existing |
| | | | Eight unmetered Christmas lights are not recorded in RAMM. This may result in estimated under submission of 120 W or 50.4 kWh p.a. | Still existing |
| Volume information accuracy | 3.2 | 15.2 and 15.37B(c) | One light (light ID 1786) has an unknown lamp model, and a missing lamp wattage and gear wattage, which could result in potential under submission of 354.5 kWh per annum. | Relates to NZTA |
| | | | One light (light ID 118) has a missing gear wattage, which could result in an unknown amount of under submission. | Relates to NZTA |
| | | | A further 200 lights have incorrect gear (total) wattages recorded, including the lamps with missing and invalid zero gear wattages. This may result in under reporting of 2,308 W or 9,857 kWh p.a. based on 4,271 annual burn hours. | Relates to NZTA |
| | | | Ten unmetered decorative lights are not recorded in RAMM. This may result in estimated under submission of 1,700W or 726 kWh p.a. | Still existing |
| | | | Eight unmetered Christmas lights are not recorded in RAMM. This may result in estimated under submission of 120 W or 50.4 kWh p.a. | Still existing |
| | | | The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. | Still existing |

## Table of Recommendations

| Subject | Section | Description | Recommendation | **Status** |
|---|---|---|---|---|
| Christmas and decorative lights | 2.5 | Christmas and decorative lights | Add the Christmas and decorative lights to RAMM. Communicate on and off dates for Christmas lights to Genesis. | Underway, to be implemented |
| Railway subway lights | 2.5 | Railway subway lights | Confirm the correct wattages for the railway subway lights on SH2 Broadway (location 11274) and update the database as necessary. | Relates to NZTA |
| ICP number accuracy | 3.1 | ICP number accuracy | Check the ICP numbers for the seven items of load connected to 0089352001PC37D (Under Veranda Lights - Romeo Street) which do not appear to be under verandah lights, and four items of load connected to 0080012045PC49C (Carriageway Lighting) which do not appear to be carriageway lights.<br>Update RAMM as necessary. | Relates to NZTA |

### 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:*

- *by 1 June 2018 (for DUML that existed prior to 1 June 2017)*
- *within three months of submission to the reconciliation manager (for new DUML)*
- *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 the DUML load as NHH using the NST profile. Wattages are derived from an extract provided by SDC each month.

Since the February 2020 submission on and off times have been derived from data logger information. Prior to February 2020, Astronomical Society data was used to determine on and off times. Genesis has submitted revised submission using data logger hours to correct this.

I checked the June 2021 submission data, and the correct volumes had been submitted for SDC ICP 0089352004PCE32. The NZTA lighting load should no longer being reconciled from this database from 1 June 2021. This load is in the process of being removed so submission for the NZTA streetlight load will have been submitted twice from June 2021 to September 2021. This will have resulted in an estimated over submission of 49,635 kWh. Genesis will correct this via the revision process.

The database accuracy was checked, and the following inaccuracies were found:

| Issue | Estimated volume information impact (annual kWh) | Comment |
|---|---|---|
| Eight unmetered Christmas lights are not recorded in RAMM. | Potential under submission of 50.4 kWh p.a.[1] | Present in the 2020 audit. SDC intend to correct this. |
| Ten unmetered decorative lights are not recorded in RAMM. | Potential under submission of 726 kWh p.a. | Present in the 2020 audit. SDC intend to correct this. |
| Database accuracy is just outside the allowable +/- 5 % threshold | Potential under submission of 1,500 kWh p.a. | |

On 18 June 2019, the Electricity Authority issued a memo clarifying the memo of 2012 that stated that a monthly snapshot was sufficient to calculate submission from, and confirmed the code requirement to calculate the correct monthly load must:

- take into account when each item of load was physically installed or removed, and

[1] Based on total festive light wattage of 120 W connected for six summer weeks per annum (approximately 420 burn hours), omission of the lights from the database may lead to potential under submission of 50.4 kWh p.a.

- 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. 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. Genesis is working with SDC to get a monthly report with changes tracked.

**Audit outcome**

Non-compliant

| Non-compliance | Description |
|---|---|
| Audit Ref: 2.1<br>With: Clause 11(1) of Schedule 15.3<br><br>From: 13-Mar-20<br>To: 30-Jul-21 | Estimated over submission of 49,635 kWh for the NZTA lights that were being reconciled in the SDC and NZTA RAMM database.<br>Ten unmetered decorative lights are not recorded in RAMM. This may result in estimated under submission of 1,700W or 726 kWh p.a.<br>Eight unmetered Christmas lights are not recorded in RAMM. This may result in estimated under submission of 120 W or 50.4 kWh p.a.<br>The database is outside of the allowable +/-5% threshold. In absolute terms, total annual consumption is estimated to be 1,500 kWh higher than the DUML database indicates.<br>The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.<br>Potential impact: Low<br>Actual impact: High<br>Audit history: Three times previously<br>Controls: Moderate<br>Breach risk rating: 6 |
| **Audit risk rating** | **Rationale for audit risk rating** |
| **High** | The controls are rated as moderate, as the processes in place are generally robust but the NZTA lighting load being submitted twice reduces the control rating to moderate.<br>The impact is assessed to be low based on the kWh differences described above. |

| Actions taken to resolve the issue | Completion date | Remedial action status |
|---|---|---|
| Genesis has corrected the submission volumes to exclude NZTA asset from the 01/06/2021. | 27/09/2021 | Identified |
| Genesis has also discussed the importance of tracking of change and the need to increase database accuracy level. | 01/04/2022 | |
| SDC has advised that they will update their RAMM data base to include the Christmas lights and advise on and off dates to Genesis. | 01/12/2021 | |
| **Preventative actions taken to ensure no further issues will occur** | **Completion date** | |
| Genesis will provide exception reporting to the council where exceptions have been identified. Genesis will continue to develop tracking of change requirements with the council to enable compliance to be achieved. | 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**

All items of load have an ICP number recorded. The accuracy of ICP numbers is assessed in **section 3.1**.

**Audit outcome**

Compliant

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

**Code reference**

*Clause 11(2)(b) of Schedule 15.3*

**Code related audit information**

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

**Audit observation**

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

**Audit commentary**

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

**Audit outcome**

Compliant

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

**Code reference**

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

**Code related audit information**

*The DUML database must contain:*

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

### Audit observation

The database was checked to confirm that:

- it contained a field for light type and wattage capacity,
- wattage capacities include any ballast or gear wattage, and
- each item of load has a light type, light wattage, and gear wattage recorded.

### Audit commentary

The database contains a lamp make model description, lamp wattage and gear wattage. There was one item of load with no lamp make and model or wattage recorded:

| Road Name | Pole ID | Lamp Make Model | Lamp wattage | Gear Wattage | Comment |
|---|---|---|---|---|---|
| Regan St | 1 | Blank | Blank | Blank | SDC are investigating this and will update ASAP. |

The discrepancies recorded in the last audit relating to missing information are all associated with NZTA lights so are outside the scope of this audit.

The accuracy of the non-zero recorded wattages is discussed in **section 3.1**.

### Audit outcome

Non-compliant

| Non-compliance | Description |
|---|---|
| Audit Ref: 2.4<br>With: Clause 11(2)(c) and (d) of Schedule 15.3<br><br>From: 13-Mar-20<br>To: 30-Jul-21 | One light has an unknown lamp model, and a missing lamp wattage and gear wattage.<br>Potential impact: Low<br>Actual impact: Low<br>Audit history: Twice previously<br>Controls: Strong<br>Breach risk rating: 1 |
| **Audit risk rating** | **Rationale for audit risk rating** |
| **Low** | Controls are rated as strong as the processes in place for the management of the SDC are robust.<br>The impact is assessed to be low as was only one item of load with missing details. |

| Actions taken to resolve the issue | Completion date | Remedial action status |
|---|---|---|
| Genesis has discussed the audit findings with the council with the intent the council makes every effort to ensure the exceptions are rectified. | Continuous improvement | Identified |
| **Preventative actions taken to ensure no further issues will occur** | **Completion date** | |
| Genesis will provide exception reporting to the council where exceptions have been identified. Genesis will continue to develop tracking of change requirements with the council to enable compliance to be achieved. | Continuous improvement | |

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

### Code reference

*Clause 11(2A) of Schedule 15.3*

### Code related audit information

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

### Audit observation

The field audit was undertaken of a statistical sample of 154 items of load on 20 September 2021. The sample was selected from three strata as follows:

1. A-E,
2. F-O, and
3. P-Z.

### Audit commentary

The field audit discrepancies are detailed in the table below:

| Street | Database count | Field count | Light count difference | Wattage recorded incorrectly | Comments |
|---|---|---|---|---|---|
| CELIA STREET (1 EAST) | 20 | 19 | -1 | - | 1x 24W LED missing in the field |
| CORDELIA STREET (1 NORTH) | 14 | 17 | +3 | - | 3x additional 24W LEDs found in the field |
| JULIET STREET | 27 | 28 | +1 | - | 1x additional 24W LED found in the field |
| **Grand Total** | **154** | **157** | **5 (-1 +4)** | **-** | |

The field audit found four additional lights in the sample checked. This is recorded as non-compliance. Wattage differences are recorded as non-compliance in **section 3.1**.

As detailed in the last two audits, Christmas and decorative lights are connected to the streetlight circuits when operating but are not recorded in RAMM. This is recorded as non-compliance in **sections 2.1**, **3.1** and **3.2**, and I repeat the last audit recommendation to maintain visibility.

| Description | Recommendation | Audited party comment | Remedial action |
|---|---|---|---|
| Christmas and decorative lights | Add the Christmas and decorative lights to RAMM.<br>Communicate on and off dates for Christmas lights to Genesis. | Genesis has discussed the audit findings with the council with the intent that the council makes every effort to ensure that the Christmas lights are included in the RAMM data base and advise of on and off dates. | Identified |

### Audit outcome

Non-compliant

| Non-compliance | Description |
|---|---|
| Audit Ref: 2.5<br>With: Clause 11(2A) of Schedule 15.3<br><br>From: 13-Mar-20<br>To: 30-Jul-21 | Four additional lights found in the field from the sample of 154 lights checked.<br>Ten unmetered decorative lights are not recorded in RAMM. This may result in estimated under submission of 1,700W or 726 kWh p.a.<br>Eight unmetered Christmas lights are not recorded in RAMM. This may result in estimated under submission of 120 W or 50.4 kWh p.a.<br>Potential impact: Low<br>Actual impact: Low<br>Audit history: Twice previously<br>Controls: Moderate<br>Breach risk rating: 2 |
| **Audit risk rating** | **Rationale for audit risk rating** |
| **Low** | A control rating of moderate was selected, because the controls over the inclusion of Christmas and decorative lights are weak but will improve to strong once the lights have been added to the database.<br>The impact is assessed to be low based on the kWh differences described above. |

| Actions taken to resolve the issue | Completion date | Remedial action status |
|---|---|---|
| Genesis has discussed the audit findings with the council with the intent that the council makes every effort to ensure that the Christmas lights are included in the RAMM data base and advise of on and off dates.<br>SDC has been provided the details of the missing Lamp information and are currently in the process of updating RAMM. | 01/12/2021 | Identified |
| **Preventative actions taken to ensure no further issues will occur** | **Completion date** | |
| No comment provided | | |

## 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 RAMM 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 database has a complete audit trail.

### Audit outcome

Compliant

## 3. ACCURACY OF DUML DATABASE

### 3.1. Database accuracy (Clause 15.2 and 15.37B(b))

**Code reference**

*Clause 15.2 and 15.37B(b)*

**Code related audit information**

*Audit must verify that the information recorded in the retailer's DUML database is complete and accurate.*

**Audit observation**

Genesis' submissions are based on August 2021, 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 | Stratford District Council streetlights excluding NZTA lighting |
| Strata | The database contains the SDC items of load DUML in the Stratford region.<br>The processes for the management of all SDC items of load are the same, but I decided to place the items of load into three strata:<br>1. A-E,<br>2. F-O, and<br>3. P-Z. |
| 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 19 sub-units. |
| Total items of load | 154 items of load were checked, making up 6% of the database load. |

Wattages were checked for alignment with the published standardised wattage table produced by the Electricity Authority against the database or in the case of LED lights against the LED light specification.

The change management process and timeliness of database updates was evaluated.

**Audit commentary**

**Field audit findings**

A field audit was conducted of a statistical sample of 154 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 | 101.8 | Wattage from survey is higher than the database wattage by 1.8% |
| $R_L$ | 99.2 | With a 95% level of confidence, it can be concluded that the error could be between -0.8% and 6% |
| $R_H$ | 106.0 | |

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 0.8% lower and 6% 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 the same as the database indicates.
- There is a 95% level of confidence that the installed capacity is between 0 and 1 kW higher than the database.
- In absolute terms, total annual consumption is estimated to be 1,500 kWh higher than the DUML database indicates.
- There is a 95% level of confidence that the annual consumption is between 700 kWh p.a. lower to 4,900 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 % |

**Light description and capacity accuracy**

As discussed in **section 2.4**, one item of load has no model, gear wattage and/or lamp wattage information.

Lamp and gear wattages were compared to the expected values. The gear wattage field records the total wattage for each item of load, including lamp and gear wattage. This is technically non-compliant, and I have provided SDC with the Electricity Authority's standardised wattage table to check and correct against. Genesis have checks in place to ensure the correct total wattage is submitted so this has no impact on reconciliation.

The errors recorded in the last audit in relation to incorrect total wattages all relate to NZTA lighting, so this is no longer included in this audit's scope.

**Address accuracy**

As discussed in **section 2.3**, all items of load have address information recorded. No inaccurate addresses were identified during the field audit.

**ICP number accuracy**

SDC has one ICP allocated for the unmetered streetlight load as it is connected to one NSP. The other three ICPs previously associated with this database are now being reconciled in the NZTA RAMM database under ICP 1000592743PC8FF. The issues raised in the last audit all relate to NZTA items of load so are no longer part of this audit's scope.

**Change management process findings**

Fault, maintenance and upgrade work is completed by NPE Tech. This is going out to tender in six months' time.

NPE Tech updates the database from the field using PDAs, or from the office based on paper field records. Where the changes are entered from the field using PDAs, the change date will reflect the date that the change occurred. When changes are entered in the office the user enters an asset change date which reflects the date that the work was carried out. NPE Tech are responsible for validating any work completed in RAMM.

New connections are infrequent, and none have occurred during the audit period. In the event of a new connection, the SDC roading team works closely with the planning team to identify new subdivisions that will have streetlighting. The roading team approves any proposed streetlights, and the developer is responsible for installation and advising SDC once the work is complete. NPE Tech updates RAMM once the lights have been installed. The RAMM database records an installation date, and there is no separate livening date. It is expected that NPE Tech will enter the connection date as the livening date if a new connection occurs.

SDC's LED road lighting upgrade project is now complete.

Outage patrols are completed by NPE Tech every three months. Outages are also reported by residents within the SDC region and work orders are raised with NPE Tech as required.

**Christmas lights**

As recorded in the last audit, Christmas lights are connected to the streetlight circuits when operating but are not recorded in RAMM. SDC confirmed that there are four 15 W Christmas tree lights and four 15 W Christmas bell lights, which are typically connected for six weeks from the first of December until the second week of January. SDC confirmed the correct wattages with the supplier during the audit.

These lights are still to be added the lights to the database against the associated poles and communicate on and off dates to Genesis and I have repeated the last audit's recommendation in **section 2.5**, to maintain visibility of this.

Based on total Christmas light wattage of 120 W connected for six summer weeks per annum (approximately 420 burn hours), omission of the lights from the database may lead to potential under submission of 50.4 kWh p.a.

**Decorative lights**

As recorded in the last audit, ten poles in the town centre have Inari 200 17 W decorative lights installed. These lights operate year-round and are connected to the streetlight circuits but are not recorded in RAMM. SDC confirmed the correct wattages with the supplier during the audit.

SDC intend to add the lights to the database against the associated poles and I have repeated the last audit's recommendation in **section 2.5**, to maintain visibility of this.

Exclusion of the decorative lights from RAMM may result in under reporting of 1,700 W or 726 kWh p.a. based on 4,271 annual burn hours.

**Private lights**

There are no private lights recorded in the database, and SDC confirmed that they are not aware of any private streetlights in the SDC region.

**Audit outcome**

Non-compliant

| Non-compliance | Description |
|---|---|
| Audit Ref: 3.1<br>With: Clause 15.2 and 15.37B(b)<br><br>From: 12-Mar-20<br>To: 12-Mar-20 | The database is outside of the allowable +/-5% threshold. In absolute terms, total annual consumption is estimated to be 1,500 kWh higher than the DUML database indicates.<br>Ten unmetered decorative lights are not recorded in RAMM. This may result in estimated under submission of 1,700W or 726 kWh p.a.<br>Eight unmetered Christmas lights are not recorded in RAMM. This may result in estimated under submission of 120 W or 50.4 kWh p.a.<br>Potential impact: Low<br>Actual impact: Low<br>Audit history: Three times previously<br>Controls: Moderate<br>Breach risk rating: 2 |
| **Audit risk rating** | **Rationale for audit risk rating** |
| **Low** | A control rating of moderate was selected, because the controls over the inclusion of Christmas and decorative lights are weak but will improve to strong once the lights have been added to the database.<br>The impact is assessed to be low based on the kWh differences described above. |

| Actions taken to resolve the issue | Completion date | Remedial action status |
|---|---|---|
| SDC has advised that they will update their RAMM data base to include the Christmas lights and advised on and off dates to Genesis. | 01/12/2021 | Identified |
| **Preventative actions taken to ensure no further issues will occur** | **Completion date** | |
| No comment provided | | |

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

### Code reference

*Clause 15.2 and 15.37B(c)*

### Code related audit information

*The audit must verify that:*

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

### Audit observation

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

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

### Audit commentary

Genesis reconciles the DUML load as NHH using the NST profile. Wattages are derived from an extract provided by SDC each month.

Since the February 2020 submission on and off times have been derived from data logger information. Prior to February 2020, Astronomical Society data was used to determine on and off times. Genesis has submitted revised submission volumes using data logger hours to correct this.

I checked the June 2021 submission data, and the correct volumes had been submitted for SDC ICP 0089352004PCE32. The NZTA lighting load should no longer being reconciled from this database from 1 June 2021. This load is in the process of being removed so submission for the NZTA streetlight load will have been submitted twice from June 2021 to September 2021. This will have resulted in an estimated over submission of 49,635 kWh. Genesis will correct this via the revision process.

The database accuracy was checked, and the following inaccuracies were found:

| Issue | Estimated volume information impact (annual kWh) | Comment |
|---|---|---|
| Eight unmetered Christmas lights are not recorded in RAMM. | Potential under submission of 50.4 kWh p.a.[2] | Present in the 2020 audit. SDC intend to correct this. |
| Ten unmetered decorative lights are not recorded in RAMM. | Potential under submission of 726 kWh p.a. | Present in the 2020 audit. SDC intend to correct this. |
| Database accuracy is just outside the allowable +/- 5 % threshold | Potential under submission of 1,500 kWh p.a. | |

[2] Based on total festive light wattage of 120 W connected for six summer weeks per annum (approximately 420 burn hours), omission of the lights from the database may lead to potential under submission of 50.4 kWh p.a.

On 18 June 2019, the Electricity Authority issued a memo clarifying the memo of 2012 that stated that a monthly snapshot was sufficient to calculate submission from, and confirmed 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. 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. Genesis is working with SDC to get a monthly report with changes tracked.

**Audit outcome**

Non-compliant

| Non-compliance | Description |
|---|---|
| Audit Ref: 3.2<br>With: Clause 15.2 and 15.37B(c)<br><br>From: 13-Mar-20<br>To: 30-Jul-21 | Estimated over submission of 49,635 kWh for the NZTA lights that were being reconciled in the SDC and NZTA RAMM database.<br>Ten unmetered decorative lights are not recorded in RAMM. This may result in estimated under submission of 1,700W or 726 kWh p.a.<br>Eight unmetered Christmas lights are not recorded in RAMM. This may result in estimated under submission of 120 W or 50.4 kWh p.a.<br>The database is outside of the allowable +/-5% threshold. In absolute terms, total annual consumption is estimated to be 1,500 kWh higher than the DUML database indicates.<br>The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.<br>Potential impact: Low<br>Actual impact: High<br>Audit history: Three times previously<br>Controls: Moderate<br>Breach risk rating: 6 |
| **Audit risk rating** | **Rationale for audit risk rating** |
| **High** | The controls are rated as moderate, as the processes in place are generally robust but the NZTA lighting load being submitted twice reduces the control rating to moderate.<br>The impact is assessed to be low based on the kWh differences described above. |

| Actions taken to resolve the issue | Completion date | Remedial action status |
|---|---|---|
| Genesis has corrected the submission volumes to exclude NZTA asset from the 01/06/2021. | 27/09/2021 | Identified |
| Genesis has also discussed the importance of tracking of change and the need to increase database accuracy level. | 01/04/2022 | |
| SDC has advised that they will update their RAMM data base to include the Christmas lights and advised on and off dates to Genesis. | 01/12/2021 | |
| **Preventative actions taken to ensure no further issues will occur** | **Completion date** | |
| Genesis will provide exception reporting to the council where exceptions have been identified. Genesis will continue to develop tracking of change requirements with the council to enable compliance to be achieved. | Continuous improvement | |

## CONCLUSION

A RAMM database is held by SDC, who is Genesis' customer. NPE Tech are responsible for fault, maintenance, and upgrade work for streetlights, and maintain the database. This contract will be out for tender in the next six months.

The NZTA lighting load should no longer being reconciled from this database from 1 June 2021. This load is in the process of being removed so submission for the NZTA streetlight load will have been submitted twice from June 2021 to September 2021. This will have resulted in an estimated over submission of 49,635 kWh. Genesis will correct this via the revision process.

Many of the database issues identified in the last audit were attributed to the NZTA lighting load and therefore the overall accuracy of the remaining items of load is high with robust processes in place to manage these.

The field audit found a small number of lighting discrepancies which has resulting in the database falling just outside the allowable threshold of +/-5%:

- In absolute terms the installed capacity is estimated to be the same as the database indicates.
- In absolute terms, total annual consumption is estimated to be 1,500 kWh higher than the DUML database indicates.
- There is a 95% level of confidence that the annual consumption is between 1700 kWh p.a. lower to 4,900 kWh p.a. higher than the database indicates.

The audit found five non-compliances, and one recommendation is made. The future risk rating of 17 indicates that the next audit be completed in six months. I have considered this in conjunction with Genesis' comments and:

- the issue of submission occurring twice for the same load is being corrected by Genesis via the revision process, and
- overall, the processes in place to manage the database accuracy are robust with some minor fixes needed to move controls to strong.

Therefore, I recommend that the next audit be in nine months time.

## PARTICIPANT RESPONSE

Genesis has discussed the audit findings with the council with the intent that the council makes every effort to ensure that the RAMM data base is been updated and any changes made within the month is accounted for.

Genesis will continue to provide assistance to SDC in the development of their reporting from RAMM and assist with reporting any anomalies Genesis finds with their data for SDC to review.