# ELECTRICITY INDUSTRY PARTICIPATION CODE
# DISTRIBUTED UNMETERED LOAD AUDIT REPORT

For

# QUEENSTOWN LAKES DISTRICT COUNCIL AND GENESIS ENERGY

Prepared by: Steve Woods

Date audit commenced: 20 January 2021

Date audit report completed: 24 February 2021

Audit report due date: 01-Mar-21

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## EXECUTIVE SUMMARY

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

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

The RAMM database is managed by QLDC. New Connection work is completed by Powernet and Aurora. Faults and maintenance work are completed by McKay Electrical.

QLDC have largely finished the LED roll out. McKay Electrical were expected to have undertaken a 100% field audit, but due to COVID-19 this is still in progress.

Genesis are tracking light changes made in the database from the date the change is made and revisions are completed where corrections are required.

The main finding is in absolute terms, total annual consumption is estimated to be 12,000 kWh lower than the DUML database indicates.

The audit found five non-compliances. The future risk rating of 15 indicates that the next audit be completed in 12 months. I have considered this in conjunction with the comments provided by Genesis Energy 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 not confirmed as accurate with a 95% level of confidence with a potential under submission of approximately 12,000 kWh per annum.<br><br>18 x 25W fluorescent lights should have a 7.8W ballast applied but have a 5W ballast applied resulting in a minor estimated annual under submission of 215 kWh.<br><br>1 x 26W compact fluorescent lights should have a 2.6W ballast applied but has 5W ballast applied resulting in a minor estimated annual over submission of 11 kWh.<br><br>Under submission of 6,444 kWh for the month of December for ICPs 0000480064CEA92 and 0000027637CE36B. | Moderate | Medium | 4 | Identified |
| Description and capacity of load | 2.4 | 11(2)(a) of Schedule 15.3 | One Metal Halide lamp with no gear wattage recorded. | Strong | Low | 1 | Identified |
| All load recorded in database | 2.5 | 11(2A) and (d) of Schedule 15.3 | 13 additional items of load found in the field. | Moderate | Medium | 4 | 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 not confirmed as accurate with a 95% level of confidence with a potential under submission of approximately 12,000 kWh per annum.<br><br>18 x 25W fluorescent lights should have a 7.8W ballast applied but have a 5W ballast applied resulting in a minor estimated annual under submission of 215 kWh.<br><br>1 x 26W compact fluorescent lights should have a 2.6W ballast applied but has 5W ballast applied resulting in a minor estimated annual submission of 11 kWh. | 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) | The database is not confirmed as accurate with a 95% level of confidence with a potential under submission of approximately 12,000 kWh per annum.<br><br>18 x 25W fluorescent lights should have a 7.8W ballast applied but have a 5W ballast applied resulting in a minor estimated annual under submission of 215 kWh.<br><br>1 x 26W compact fluorescent lights should have a 2.6W ballast applied but has 5W ballast applied resulting in a minor estimated annual over submission of 11 kWh.<br><br>Under submission of 6,444 kWh for the month of December for ICPs 0000480064CEA92 and 0000027637CE36B. | Moderate | Medium | 4 | |
| Future Risk Rating | | | | | | 15 | |

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

## RECOMMENDATIONS

| Subject | Section | Recommendation |
|---|---|---|
| Database accuracy | 3.1 | Genesis to liaise with QLDC, Aurora and PowerNet to review the electrical connection of streetlights |

## 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

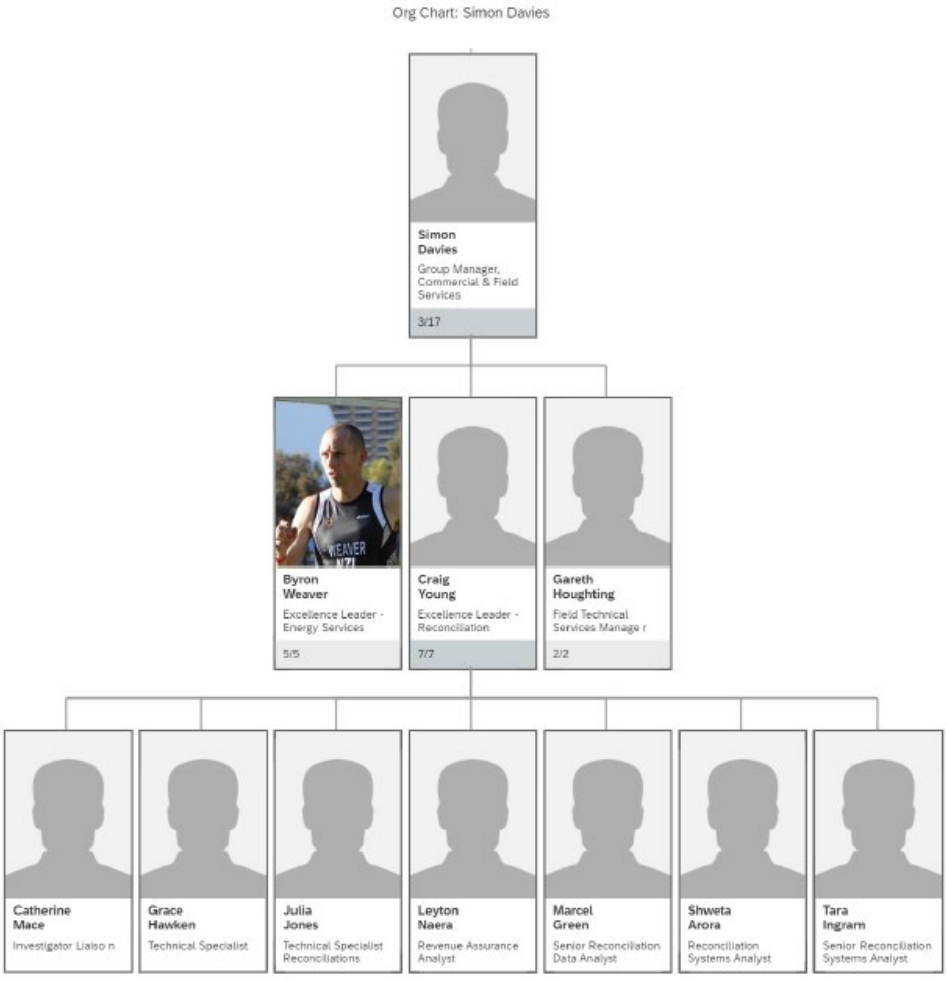
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

### 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:

| Name | Company | Role |
|---|---|---|
| Steve Woods | Veritek Limited | Lead Auditor |
| Claire Stanley | Veritek Limited | Supporting Auditor |

Other personnel assisting in this audit were:

| Name | Title | Organisation |
|---|---|---|
| Roger Hughes | Contract Data Engineer | QLDC |
| Craig Young | Excellence Leader - Reconciliation | Genesis Energy |
| Julia Jones | Technical Specialist - Reconciliations Team | Genesis Energy |

## 1.4. Hardware and Software

The SQL database used for the management of DUML is remotely hosted by RAMM Software Ltd. The database is commonly known as "RAMM" which stands for "Roading Asset and Maintenance Management".

QLDC confirmed that the database 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

| ICP Number | Description | NSP | Number of items of load | Database wattage (watts) |
|---|---|---|---|---|
| 0000027637CE36B | Frankton | FKN0331 | 2,296 | 127,543 |
| 0000480064CEA92 | QLDC lights Lakeview subdivision | CML0331 | 2,139 | 110,348 |
| 0000950000LN0EC | KINGSTON | FKN0331 | 747 | 41,401 |
| 0000990001LN819 | CROMWELL GXP | NLK0111 | 193 | 4,675 |
| 0008801006TP2A7 | FRANKTON GXP | NMA0331 | 58 | 1,334 |
| | | TOTAL QLDC: | 5,433 | 285,301 |

## 1.7. Authorisation Received

All information was provided directly by Genesis and QLDC.

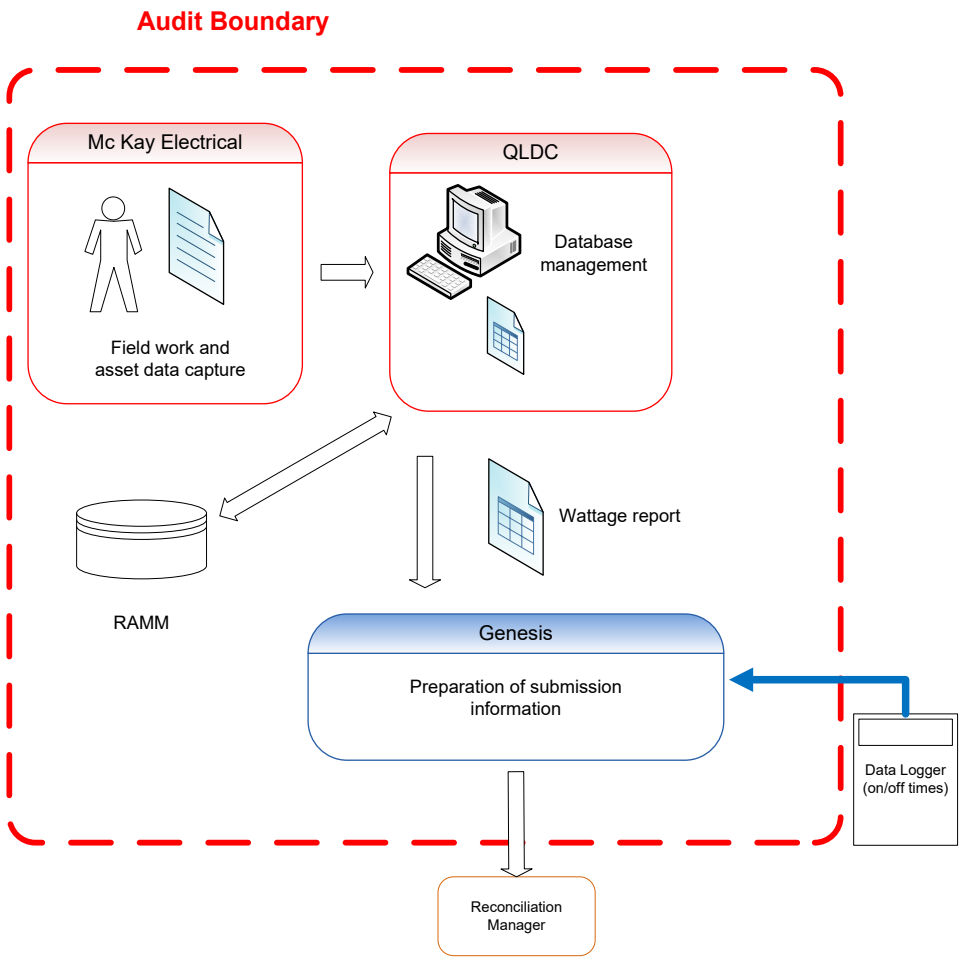
## 1.8. Scope of Audit

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

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

McKay Electrical are the field contractor for QLDC.

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




The audit was carried out via phone on 2nd February 2021. The field audit was undertaken of 303 lights using the statistical sampling methodology on the 27th and 28th January 2021.

## 1.9. Summary of previous audit

The previous audit report conducted for Genesis Energy in March 2020 by Rebecca Elliot of Veritek Limited was reviewed. Six non-compliances and one recommendation was made. The current status of these are detailed below:

### NON-COMPLIANCES

| Subject | Section | Clause | Non-compliance | Status |
|---|---|---|---|---|
| Deriving submission information | 2.1 | 11(1) of Schedule 15.3 | Potential over submission of 448 kWh p.a. due to incorrect on/off times.<br>The database accuracy is assessed to be 111.9% of the database for the sample checked indicating a potential under submission of approximately 133,500 kWh per annum.<br>18 x 25W fluorescent lights should a 7.8W ballast applied but have a 5W ballast applied resulting in a minor estimated annual under submission of 215 kWh.<br>1x 103W LED has a ballast of 14W applied when this should be zero resulting in a minor estimated annual over submission of 60 kWh.<br>The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. | Resolved<br>Still existing<br>Still existing<br>Resolved<br>Resolved |
| Location of each item of load | 2.3 | 11(2)(b) of Schedule 15.3 | Two items of load not readily locatable. | Resolved |
| All load recorded in database | 2.5 | 11(2A) and (d) of Schedule 15.3 | 25 additional items of load found. | Existing for different lights |
| Database accuracy | 3.1 | 15.2 and 15.37B(b) | The database accuracy is assessed to be 111.9% of the database for the sample checked indicating a potential under submission of approximately 133,500 kWh per annum.<br>18 x 25W fluorescent lights should a 7.8W ballast applied but have a 5W ballast applied resulting in a minor estimated annual under submission of 215 kWh.<br>1x 103W LED has a ballast of 14W applied when this should be zero resulting in a minor estimated annual over submission of 60 kWh. | Still existing<br>Still existing<br>Resolved |

| Subject | Section | Clause | Non-compliance | Status |
|---|---|---|---|---|
| Volume information accuracy | 3.2 | 15.2 and 15.37B(c) | Potential over submission of 448 kWh p.a. due to incorrect on/off times.<br>The database accuracy is assessed to be 111.9% of the database for the sample checked indicating a potential under submission of approximately 133,500 kWh per annum.<br>18 x 25W fluorescent lights should a 7.8W ballast applied but have a 5W ballast applied resulting in a minor estimated annual under submission of 215 kWh.<br>1x 103W LED has a ballast of 14W applied when this should be zero resulting in a minor estimated annual over submission of 60 kWh.<br>The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. | Resolved<br>Still existing<br>Still existing<br>Resolved<br>Resolved |

## RECOMMENDATIONS

| Subject | Section | Recommendation | Status |
|---|---|---|---|
| Tracking of load change | 2.6 | Genesis to liaise with QLDC, Aurora and PowerNet to review the electrical connection of streetlights. | Still existing |

## 1.10. Distributed unmetered load audits (Clause 16A.26 and 17.295F)

### Code reference

*Clause 16A.26 and 17.295F*

### Code related audit information

*Retailers must ensure that DUML database audits are completed:*

1. *by 1 June 2018 (for DUML that existed prior to 1 June 2017)*
2. *within three months of submission to the reconciliation manager (for new DUML)*
3. *within the timeframe specified by the Authority for DUML that has been audited since 1 June 2017.*

### Audit observation

Genesis 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 database was checked for accuracy.

**Audit commentary**

Genesis reconciles this DUML load using the SST profile. Submissions are based on the database information and data logger hours for all ICPs. The issue of the "profile night hours" for ICP 0000990001LN819 has been resolved.

I recalculated the submissions for December 2020 for the five ICPs associated with the QDLC database using the data logger and database information. I identified an error with the submission data where the ballast was not included for ICPs 0000480064CEA92 and 0000027637CE36B. This was due to the use of the Distributor's summary report for these two ICPs being used to calculate submission rather than from the full extract from the council which is also provided. This resulted in an under submission of 6,444 kWh for the month of December. This is expected to be corrected through the revision process.

The field audit against the database quantities found that the database is not confirmed as accurate with a 95% level of confidence resulting in an estimated under submission of 12,000 kWh per annum. This is detailed in **section 3.1**.

A check of the wattages applied identified a small number of lights with the incorrect wattage applied and one item of load with no wattage recorded; this will be resulting in an estimated minor under submission of 226 kWh as detailed in **sections 3.1** and **3.2**.

On 18 June 2019, the Electricity Authority issued a memo confirming that the code requirement to calculate the correct monthly load must:

- take into account when each item of load was physically installed or removed, and
- wash up volumes must take into account where historical corrections have been made to the DUML load and volumes.

The monthly report is now being provided with changes made through the month. The database contains a "light date added" and a "lamp date changed". Genesis calculates the load from the date the light is added (vested), changed or removed. Revisions are completed where corrections are required.

**Audit outcome**

Non-compliant

| Non-compliance | Description |
|---|---|
| Audit Ref: 2.1<br>With: 11(1) of Schedule 15.3<br><br>From: 01-Jan-20<br>To: 20-Jan-21 | The database is not confirmed as accurate with a 95% level of confidence with a potential under submission of approximately 12,000 kWh per annum.<br>18 x 25W fluorescent lights should have a 7.8W ballast applied but have a 5W ballast applied resulting in a minor estimated annual under submission of 215 kWh.<br>1 x 26W compact fluorescent lights should have a 2.6W ballast applied but has 5W ballast applied resulting in a minor estimated annual over submission of 11 kWh.<br>Under submission of 6,444 kWh for the month of December for ICPs 0000480064CEA92 and 0000027637CE36B.<br>Potential impact: Medium<br>Actual impact: Medium<br>Audit history: Three times previously<br>Controls: Moderate<br>Breach risk rating: 4 |
| **Audit risk rating** | **Rationale for audit risk rating** |
| **Medium** | The controls are rated as moderate as processes to manage change capture most changes.<br>The impact is assessed to be medium, based on the database inaccuracies detailed above. |

| Actions taken to resolve the issue | Completion date | Remedial action status |
|---|---|---|
| Genesis has had staff movement which had led to some errors being made with asset calculation, the staff member used the "distributors" reporting instead of the customers data reports being provide. This has been addressed and will be rectified for revision purposes. The issue with the fluorescent lamps has be addressed and the gear wattages corrected. | 01/06/2021 | Identified |
| **Preventative actions taken to ensure no further issues will occur** | **Completion date** | |
| Genesis continues to work with the council to gain accuracy levels within their database. QLDC provide 3 different reports due to limitations of their database, the snapshot is accepted along with movement since last submission and a summary of these two reports. This enables the trader to do daily calculation of assets. | continues | |

## 2.2. ICP identifier and items of load (Clause 11(2)(a) and (aa) of Schedule 15.3)

### Code reference

*Clause 11(2)(a) and (aa) of Schedule 15.3*

### Code related audit information

*The DUML database must contain:*

- *each ICP identifier for which the retailer is responsible for the DUML*
- *the items of load associated with the ICP identifier.*

**Audit observation**

The database was checked to confirm the correct ICP was recorded against each item of load.

**Audit commentary**

All items of load have an ICP recorded against them.

**Audit outcome**

Compliant

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

**Code reference**

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

**Code related audit information**

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

**Audit observation**

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

**Audit commentary**

The database contains fields for the street address and GPS coordinates.

**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 the manufacturers rated wattage and the ballast wattage. The extract provided has fields for lamp and gear make and model. Analysis found all had details populated except for one Metal Halide lamp that does not have Gear Wattage recorded.

The accuracy of these 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: 01-Jan-20<br>To: 20-Jan-21 | One Metal Halide lamp with no gear wattage recorded.<br><br>Potential impact: Low<br>Actual impact: Low<br>Audit history: Three times previously<br>Controls: Strong<br>Breach risk rating:1 |
| **Audit risk rating** | **Rationale for audit risk rating** |
| **Low** | The controls are rated as strong as there are regular checks for missing data as part of regular database management routines.<br>The impact is assessed to be none/low due to only one missing ballast wattage. |

| Actions taken to resolve the issue | Completion date | Remedial action status |
|---|---|---|
| Database corrected | 01/03/2021 | Identified |
| **Preventative actions taken to ensure no further issues will occur** | **Completion date** | |
| Genesis continues to work with the council to gain accuracy levels within their database. | 01/03/2021 | |

### 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 303 items of load. The field audit was undertaken on 27th and 28th February 2021.

## Audit commentary

The table below details the roads where discrepancies were found:

| Street | Database count | Field count | Light count differences | Wattage recorded incorrectly | Comments |
|---|---|---|---|---|---|
| JACK HANLEY DRIVE | 16 | 15 | -1 | | 1 x 99W LED not found in the field |
| GLENDA DRIVE | 37 | 33 | -5<br>+1 | 1 | 4 x 70W HPS not found in the field<br>1 x 60W LED not found in the field<br>1 x additional 70W HPS found in the field<br>1 x incorrect wattage recorded as 70W HPS in the database but 118W LED found in the field |
| GOLDFIELD HEIGHTS | 20 | 21 | +1 | 2 | 1 x additional 29W LED found in the field<br>2 x incorrect wattage recorded as 70W HPS in the database but 29W LED found in the field |
| PIN OAK AVENUE | 3 | 9 | +6 | | 6 x additional 43 W lamps found in the field |
| ERSKINE STREET | 25 | 24 | -1 | | 1 x 18W Fluorescent not found in the field |
| JUNO PLACE RESERVE F1 | 1 | 2 | +1 | | 1 x 70 w HPS recorded in the database but 2 x 70 W HPS found in the field (double head lamp) |
| HEWSON CRESCENT | 9 | 9 | | 1 | 1 x incorrect wattage recorded as 70W HPS in the database but 22W LED found in the field |
| GRANDVIEW ROAD | 6 | 6 | | 1 | 1x incorrect wattage recorded as 20W LED in the database but 36W LED found in the field |
| SKYLARK PLACE | 3 | 3 | | 2 | 2 x incorrect wattage recorded as 70W MH in the database but 2x 27W LED found in the field |
| DUNGARVON STREET | 11 | 15 | +4 | | 4 x additional 29W LEDs found in the field |
| **Grand Total** | 131 | 137 | +13 -7 | 7 | |

QLDC had expected McKay Electrical to have completed the full field audit of the assets by now but this has been delayed by due to COVID-19 and is still in progress. The overall database accuracy is detailed in **section 3.1**.

The field audit found 13 additional lamps in the field. This is recorded as non-compliance below.

**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: 01-Jan-20<br>To: 20-Jan-21 | 13 additional items of load found in the field.<br>Potential impact: Medium<br>Actual impact: Medium<br>Audit history: Three times previously<br>Controls: Moderate<br>Breach risk rating: 4 |
| **Audit risk rating** | **Rationale for audit risk rating** |
| **Medium** | The controls are rated as moderate as QLDC are actively working with the field contractor to review the accuracy of data inputs.<br>The impact is assessed to be medium due to the volume of additional lights found in the field audit and taking into consideration the overall database accuracy variance detailed in **section 3.1**. |

| Actions taken to resolve the issue | Completion date | Remedial action status |
|---|---|---|
| Genesis has discussed the auditor's findings with the council who has informed Genesis they are currently visiting each street outlined first to rectify the database errors highlighted. | 01/04/2021 | Identified |
| **Preventative actions taken to ensure no further issues will occur** | **Completion date** | |
| Genesis continues to work with the council to gain accuracy levels within their database. | continues | |

## 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 tracks additions and removals as required by this clause.

### 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 RAMM database was checked for audit trails.

### Audit commentary

The RAMM database contain a complete audit trail of all additions and changes including the identifier of the person who makes any changes.

### 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 | Queenstown Lakes District Council Area |
| Strata | The database contains items of load in Queenstown Lakes District Area.<br>The processes for the management of all QLDC items of load are the same, the population was across four strata:<br>• Arrowtown,<br>• Queenstown,<br>• Wanaka, and<br>• Rural. |
| Area units | I created a pivot table of the roads in each area and I used a random number generator in a spreadsheet to select a total of 50 sub-units. |
| Total items of load | 303 items of load were checked. |

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 statistical sample of 303 items of load undertaken in anticipation of this database being used for reconciliation found that the field data was 99.0% of the database data for the sample checked.

| Result | Percentage | Comments |
|---|---|---|
| The point estimate of R | 99.0% | Wattage from survey is higher than the database wattage by 1% |
| $R_L$ | 94.3% | With a 95% level of confidence, it can be concluded that the error could be between -5.7% and +7.6% |
| $R_H$ | 107.6% | |

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 5.7% lower to 7.6% 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 3 kW lower than the database indicates.

There is a 95% level of confidence that the installed capacity is between 16 kW lower to 22 kW higher than the database.

In absolute terms, total annual consumption is estimated to be 12,000 kWh lower than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 69,500 kWh lower to 93,200 kWh higher 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 % |

**Lamp description and capacity accuracy**

Wattages for all items of load were checked against the published standardised wattage table produced by the Electricity Authority or LED light specifications and found the same wattage discrepancies as were found in the last audit:

- 18 x 25W fluorescent lights should have a 7.8W ballast applied but have a 5W ballast applied resulting in a minor estimated annual under submission of 215 kWh, and
- 1 x 26W compact fluorescent lights should have a 2.6W ballast applied but has 5W ballast applied resulting in a minor estimated annual over submission of 11 kWh.

There were an additional 98 items of load with a fluorescent wattage that is not represented on the Electricity Authority's standard wattage table therefore I am unable to confirm the correct ballasts to be applied to these and recommend that manufacturers specifications are sourced to confirm the appropriate ballast:

| **Fluorescent wattage** | **Ballast Applied** | **Volume of lights** |
|---|---|---|
| 9 | 5 | 4 |
| 12 | 5 | 1 |
| 13 | 5 | 2 |
| 18 | 5 | 28 |
| 23 | 5 | 50 |
| 50 | 5 | 2 |
| **Compact Fluorescent wattage** | **Ballast Applied** | **Volume of lights** |
| 18 | 5 | 11 |

**Change Management**

The processes were reviewed for new lamp connections and the tracking of load changes due to faults and maintenance. Genesis use the RAMM database for submission.

Any new streetlight connections on the PowerNet sections of the network are notified to QLDC. This gives QLDC notification of new assets being connected. These assets are not added to the RAMM database until the 224C notification has been received. This is often after electrical connection has occurred. In addition to this, notification from other parts of council can be slow to be provided, causing the database to be updated late.

As reported in the last audit, no notifications are received for new connections on the Aurora network. I have repeated the last audit's recommendation that Genesis liaise with QLDC and Aurora and PowerNet to review the electrical connection of streetlight circuits.

| Recommendation | Description | Audited party comment | Remedial action |
|---|---|---|---|
| Tracking of load change | Genesis to liaise with QLDC, Aurora and PowerNet to review the electrical connection of streetlights | Genesis has discussed this further with the council.<br>QLDC Property and Infrastructure will propose changes to Planning and Development Code of Practice to state that asset not yet vested to QLDC are to be on a private ICP | Investigating |

QLDC had expected McKay Electrical to have completed the full field audit by now but this has been delayed by COVID 19 and this is still in progress.

McKay Electrical undertake the outage and condition patrols.

The QLDC LED rollout is largely complete except for some of the V category and decorative lights. There is no further funding available, where a lamp requires replacing an LED lamp will be installed.

The festive lighting used in Queenstown for the winter festival, have been confirmed as connected to metered supplies.

There are eight private lights identified in the QLDC database. These are marked as private in the database. These have been passed to Aurora to resolve.

**Audit outcome**

Non-compliant

| Non-compliance | Description |
|---|---|
| Audit Ref: 3.1<br>With: Clause 15.2 and 15.37B(b)<br><br>From: 01-Jan-20<br>To: 20-Jan-21 | The database is not confirmed as accurate with a 95% level of confidence with a potential under submission of approximately 12,000 kWh per annum.<br>18 x 25W fluorescent lights should have a 7.8W ballast applied but have a 5W ballast applied resulting in a minor estimated annual under submission of 215 kWh.<br>1 x 26W compact fluorescent lights should have a 2.6W ballast applied but has 5W ballast applied resulting in a minor estimated annual submission of 11 kWh.<br>Potential impact: Medium<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** | The controls are rated as moderate as controls will mitigate risk most of the time.<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 had staff movement which had led to some errors being made with asset calculation, however have been identified and will be rectified for revision purposes. The issue with the fluorescent lamps has be addressed and the gear wattages corrected. | 01/06/2021 | Identified |
| **Preventative actions taken to ensure no further issues will occur** | **Completion date** | |
| Genesis continues to work with the council to gain accuracy levels within their database. QLDC provide 3 different reports due to limitations of their database, the snapshot is accepted along with movement since last submission and a summary of these two reports. This enables the trader to do daily calculation of assets. | continues | |

## 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 SST profile. Submissions are based on the database information and data logger hours.

I recalculated the submissions for December 2020 for the five ICPs associated with the QDLC database using the data logger and database information. I identified an error with the submission data where the ballast was not included for ICPs 0000480064CEA92 and 0000027637CE36B. This was due to the use of the Distributor's summary report for these two ICPs being used to calculate submission rather than from the full extract from the council which is also provided. This resulted in an under submission of 6,444 kWh for the month of December. This is expected to be corrected through the revision process.

The field audit against the database quantities found that the database is not confirmed as accurate with a 95% level of confidence resulting in an estimated under submission of 12,000 kWh per annum. This is detailed in **section 3.1**.

A check of the wattages applied identified a small number of lights with the incorrect wattage applied and one item of load with no wattage recorded this will be resulting in an estimated minor under submission of 226 kWh per annum as 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.

The monthly report is now being provided with changes made through the month. The database contains a "light date added" and a "lamp date changed". Genesis calculate the load from the date the light is added (vested), changed or removed. Revisions are completed where corrections are required. The inability to track newly connected lights from date of electrical connection is recorded as non-compliant.

### 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><br>From: 01-Jan-20<br>To: 20-Jan-21 | The database is not confirmed as accurate with a 95% level of confidence with a potential under submission of approximately 12,000 kWh per annum.<br>18 x 25W fluorescent lights should have a 7.8W ballast applied but have a 5W ballast applied resulting in a minor estimated annual under submission of 215 kWh.<br>1 x 26W compact fluorescent lights should have a 2.6W ballast applied but has 5W ballast applied resulting in a minor estimated annual over submission of 11 kWh.<br>Under submission of 6,444 kWh for the month of December for ICPs 0000480064CEA92 and 0000027637CE36B.<br>Potential impact: Medium<br>Actual impact: Medium<br>Audit history: Three times previously<br>Controls: Moderate<br>Breach risk rating: 4 |
| **Audit risk rating** | **Rationale for audit risk rating** |
| **Medium** | The controls are rated as moderate as processes to manage change capture most changes.<br>The impact is assessed to be medium, based on the database inaccuracies detailed above. based on the submission inaccuracies indicated by the DUML audit tool. |

| Actions taken to resolve the issue | Completion date | Remedial action status |
|---|---|---|
| Genesis has had staff movement which had led to some errors being made with asset calculation, however have been identified and will be rectified for revision purposes. The issue with the fluorescent lamps has be addressed and the gear wattages corrected. | 01/06/2021 | Identified |
| **Preventative actions taken to ensure no further issues will occur** | **Completion date** | |
| Genesis continues to work with the council to gain accuracy levels within their database. QLDC provide 3 different reports due to limitations of their database, the snapshot is accepted along with movement since last submission and a summary of these two reports. This enables the trader to do daily calculation of assets. | continues | |

## CONCLUSION

The RAMM database is managed by QLDC. New Connection work is completed by Powernet and Aurora. Faults and maintenance work are completed by McKay Electrical.

QLDC have largely finished the LED roll out. McKay Electrical were expected to have undertaken a 100% field audit, but due to COVID-19 this is still in progress.

Genesis are tracking light changes made in the database from the date the change is made and revisions are completed where corrections are required.

The main finding is in absolute terms, total annual consumption is estimated to be 12,000 kWh lower than the DUML database indicates.

The audit found five non-compliances. The future risk rating of 15 indicates that the next audit be completed in 12 months. I have considered this in conjunction with the comments provided by Genesis Energy and agree with this recommendation.

PARTICIPANT RESPONSE

Genesis continues to build on their relationship with the council. Genesis has raised their current new connection processes and the need for these to be readdressed, involving different departments of the council ensuring that they are on board enabling the compliance requirements to be met.

Genesis will be reviewing the allocations for the two icp's noted where a summary was inadvertently used in error to ascertain wattage values for the December period and is not a reflection of the customers database accuracy, merely the distributors.

Genesis has been advised that the council has already correct the gear wattage issues identified prior to this audit report being sent to Genesis for review.

QLDC has also advise that the field work has been hindered due to the COVID and its levels associated, however are doing the utmost possible to have the field audit completed.