

ELECTRICITY INDUSTRY PARTICIPATION CODE  
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

KAWERAU DISTRICT COUNCIL  
AND GENESIS ENERGY LIMITED  
NZBN:9429037706609

Prepared by: Rebecca Elliot

Date audit commenced: 26 April 2022

Date audit report completed: 23 August 2022

Audit report due date: 01-Jun-22

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## EXECUTIVE SUMMARY

This audit of the **Kawerau 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.

The scope of the audit encompasses the collection, security and accuracy of the data, including the preparation of submission information. The field work and management of the RAMM database is carried out by Horizon. WPS (formerly Opus) no longer has any involvement in the KDC database. There have been a large number of Cree lights replaced with ITRON lights during the audit period due to their high failure rate. These have been unable to be updated in RAMM as the light type needs to be added. Horizon have now added this light type and an updated database extract is expected to be provided to Genesis. Genesis have requested monthly database extracts, but KDC see no value in doing so. The increased error rate has resulted in an increase in the estimated annual over submission of volume for this streetlight load from 5,800 kWh to 14,800 kWh.

As reported in the last audit, there is a high error rate and errors found in the last two audits have not been corrected. I repeat the recommendation that a full field audit is undertaken to correct the data set. There are only 938 items of load so this should be easy to complete. This will ensure that KDC is billed correctly and submissions to the market are accurate.

This audit found seven non-compliances and makes four recommendations. The future risk rating of 28 indicates that the next audit be completed in three months.

The matters raised are detailed in the table below.

## AUDIT SUMMARY

### NON-COMPLIANCES

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Distributed unmetered load audits	1.10	16A.26	Audit report not completed by due date.	Strong	Low	1	Identified
Participants to give access	1.11	16A.4	Information was not provided within 15 business days of the request.	Weak	Low	3	Identified
Deriving submission information	2.1	11(1) of Schedule 15.3	<p>Actual on and off times not used to calculate consumption.</p> <p>Total annual consumption is estimated to be 14,800 kWh lower than the DUML database indicates, based on the field audit.</p> <p>The RAMM database is not being updated with changes made in the field.</p> <p>None of the discrepancies from the last two audits have been updated in the database including adding the lights on Anaru Drive into the database.</p> <p>Submission is based on a snapshot and does not consider historic adjustments.</p>	Weak	Medium	6	Investigating
ICP identifier and items of load	2.2	Clause 11(2)(a) and (aa) of Schedule 15.3	Blank ICP field for two items of load.	Weak	Low	3	Investigating
Description and capacity of each item of load	2.4	11(2)(c)&(d) of Schedule 15.3	Lamp and gear wattage fields not provided for the audit.	Weak	Low	3	Investigating

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Database accuracy	3.1	15.2 and 15.37B(b)	<p>Database accuracy is outside the allowable +/- 5% threshold resulting in an estimated over submission of 14,800 kWh per annum.</p> <p>Lamp and gear wattages not provided for the audit.</p> <p>Two items of load without ICPs.</p> <p>Festive lighting is connected but the volume is not recorded.</p> <p>The RAMM database is not being updated with changes made in the field.</p> <p>None of the discrepancies from the last two audits have been updated in the database including adding the lights on Anaru Drive into the database.</p>	Weak	Medium	6	Investigating
Volume information accuracy	3.2	15.2 and 15.37B(c)	<p>Actual on and off times not used to calculate consumption.</p> <p>Total annual consumption is estimated to be 14,800 kWh lower than the DUML database indicates, based on the field audit.</p> <p>The RAMM database is not being updated with changes made in the field.</p> <p>None of the discrepancies from the last two audits have been updated in the database including adding the lights on Anaru Drive into the database.</p> <p>Submission is based on a snapshot and does not</p>	Weak	Medium	6	Investigating

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
			consider historic adjustments.				
<b>Future Risk Rating</b>						<b>28</b>	

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

## RECOMMENDATIONS

Subject	Section	Description
Description and capacity of load	2.4	Confirm that the lamp wattage and ballast fields are populated.
Database accuracy	3.1	Record festive lights in RAMM.
		Liaise with KDC and Horizon to ensure new streetlights are accepted by the trader prior to them being electrically connected.
		Undertake full field audit.

## ISSUES

Subject	Section	Description	Issue
		Nil	

## 1. ADMINISTRATIVE

### 1.1. Exemptions from Obligations to Comply with Code

#### Code reference

*Section 11 of Electricity Industry Act 2010.*

#### Code related audit information

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

#### Audit observation

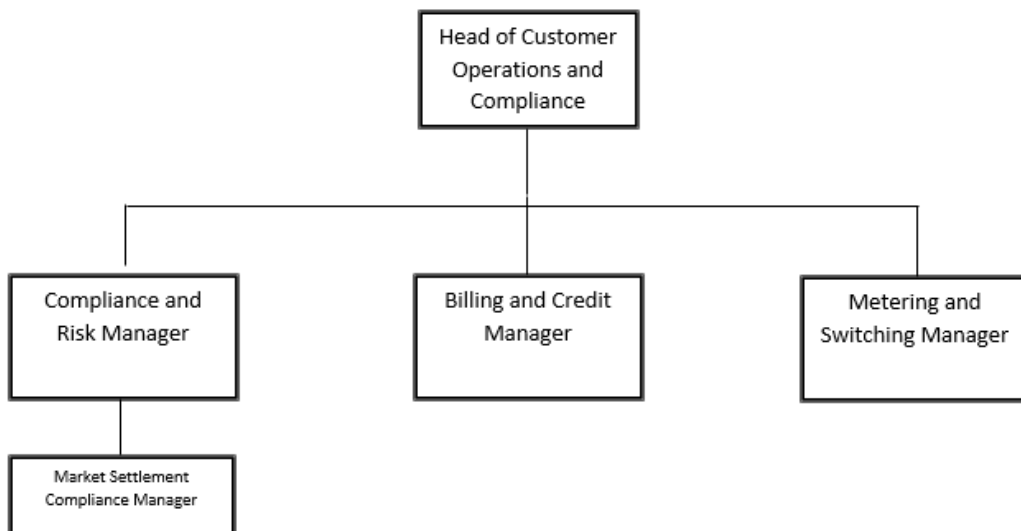
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

#### Audit commentary

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

### 1.2. Structure of Organisation

Genesis provided a copy of their organisational structure.



### 1.3. Persons involved in this audit

Auditor:

**Rebecca Elliot**

**Veritek Limited**

**Electricity Authority Approved Auditor**

Other personnel assisting in this audit were:

Name	Title	Company
Julia Jones	Rubiks SME – Retail Market Interaction	Genesis Energy
Narav Teli	DUML Data & Stakeholder Lead - Market Settlement Compliance	Genesis Energy
Andre Erasmus	Network Manager	Kawerau DC
Raiha Andrew	Regulatory and Operations Administrator	Kawerau DC
Stacey Flintoff	Streetlight Coordinator	Horizon Networks

### 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 and their agent 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	Profile	Number of items of load	Database wattage (watts)
1000023043BP177	Streetlights, KAWERAU	NST	938	47,950

### 1.7. Authorisation Received

All information was provided directly by Genesis, KDC or Horizon Network.

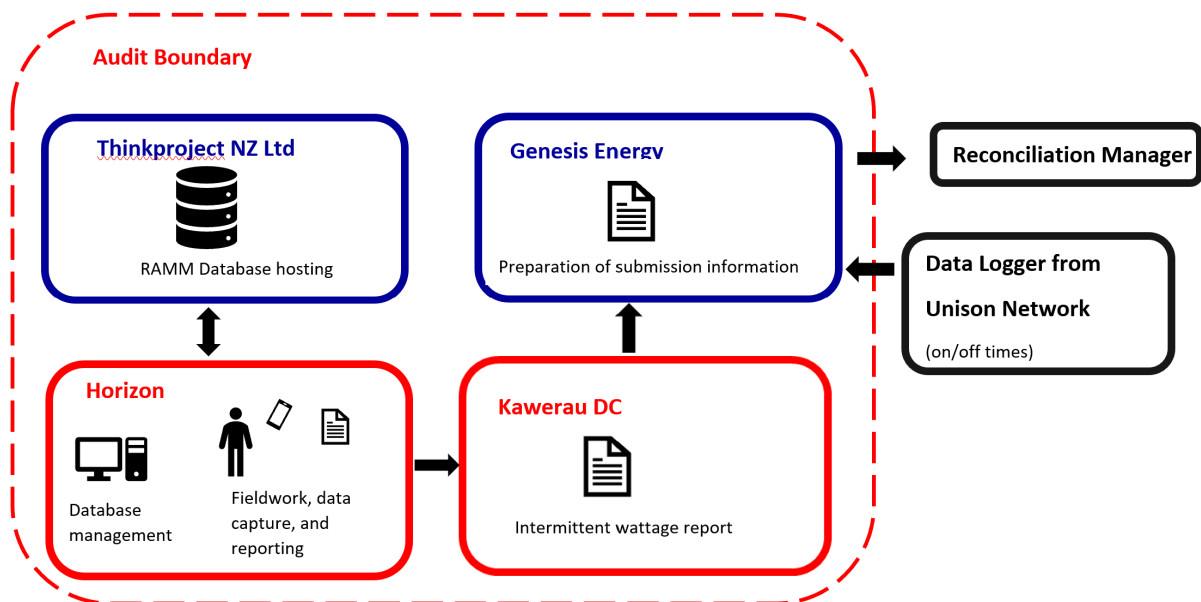


## 1.8. Scope of Audit

This audit of the **Kawerau District Council (KDC)** DUMML 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 DUMML audits version 1.1.

Genesis reconciles this DUMML load using the NST profile. The database extract provided in November 2021 is being used to calculate the kW figure. A RAMM database is managed by KDC in relation to this load. I compared the field findings to the database records.

The database is remotely hosted by thinkproject Ltd. The field work is carried out by Horizon. The asset data capture and database population are conducted by Horizon. The scope of the audit encompasses the collection, security and accuracy of the data, including the preparation of submission information. The diagram below shows the audit boundary for clarity.



The field audit was undertaken of a statistical sample of 210 items of load on 19<sup>th</sup> August 2022.

## 1.9. Summary of previous audit

The previous audit was conducted by Rebecca Elliot in November 2021. The findings are shown in the table below.

Table of Non-compliances

Subject	Section	Clause	Non-Compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	Total annual consumption is estimated to be 5,800 kWh lower than the DUMML database indicates, based on the field audit.  20 of the 23 discrepancies from the last audit have not been updated in the database, and Lights on Anaru Drive are not in the database.  Actual on and off times not used to calculate consumption.	Still existing
ICP identifier and items of load	2.2	Clause 11(2)(a) and (aa) of Schedule 15.3	Blank ICP field for two items of load.	Still existing
Description and capacity of each item of load	2.4	11(2)(c)&(d) of Schedule 15.3	Lamp and gear wattage fields not provided for the audit.	Still existing
All load recorded in database	2.5	11(2A) of Schedule 15.3	Two additional lights found in the field.	Database not updated but no extra lights found in this field audit so not repeated.
Database accuracy	3.1	15.2 and 15.37B(b)	Database accuracy is outside the allowable +/- 5% threshold resulting in an estimated over submission of 5,800 kWh per annum.  Lamp and gear wattages not provided for the audit.  Two items of load without ICPs  Festive lighting is connected but the volume is not recorded.  Lights on Anaru Drive not recorded.	Still existing
Volume information accuracy	3.2	15.2 and 15.37B(c)	Total annual consumption is estimated to be 5,800 kWh lower than the DUMML database indicates, based on the field audit.  20 of the 23 discrepancies from the last audit have not been updated in the database, and Lights on Anaru Drive are not in the database.  Actual on and off times not used to calculate consumption.	Still existing

## Table of Recommendations

Subject	Section	Description	Status
Database accuracy	3.1	Record festive lights in RAMM.	Repeated
		Review the new connection process.	Repeated
		Repeat the full field audit with a pilot and a check before the entire database is checked.	Repeated

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

#### **Code reference**

*Clause 16A.26 and 17.295F*

#### **Code related audit information**

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

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

#### **Audit observation**

Genesis have requested Veritek to undertake this streetlight audit.

#### **Audit commentary**

This audit report has not been completed on time due to the delay in getting a database extract.

#### **Audit outcome**

Non-compliant

Non-compliance	Description		
Audit Ref: 1.10 With: Clause 16A.26 From: 01-Jun-22 To: 18-Aug-22	Audit report not completed by due date. Potential impact: Low Actual impact: Low Audit history: None Controls: Strong Breach risk rating: 1		
Audit risk rating	Rationale for audit risk rating		
Low	The controls are rated as strong as a new person has been appointed to the DUML management position and is actively working to get audits completed on time. The impact is assessed to be medium there has been no improvement in the database accuracy resulting in continued inaccurate submissions.		
Actions taken to resolve the issue		Completion date	Remedial action status
Genesis Energy has appointment a DUML Data & Stakeholder Lead to provide information		01/09/2022	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
Genesis Energy has appointment a DUML Data & Stakeholder Lead to provide information		01/09/2022	

### 1.11. Participants to give access (Clause 16A.4)

#### Code reference

Clause 16A.4

#### Code related audit information

(1) A participant must give the Authority or an auditor full access to all information that may be required for the purposes of carrying out an audit.

(2) The participant must provide the information—

(a) at no charge; and

(b) no later than 15 business days after receiving a request for the information from the Authority or an auditor, as the case may be.

#### Audit observation

The code requires that information requested by the auditor be provided within 15 business days of the request. Veritek provided information requests to Genesis and KDC for the purposes of this audit.

#### Audit commentary

The information requests for this audit were issued on 26 April 2022 but the database extract was not provided until 18 August 2022 despite multiple requests to both Genesis and KDC. This is recorded as non-compliance.

## Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 1.11 With: Clause 16A.4  From: 16-May-22 To: 18-Aug-22	Information was not provided within 15 business days of the request.  Potential impact: Low Actual impact: Low Audit history: None Controls: Weak Breach risk rating: 3		
Audit risk rating	Rationale for audit risk rating		
<b>Low</b>	The controls are rated as weak as no information was provided despite multiple requests.  The impact is assessed to be low as the information was eventually provided.		
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		01/09/2022	Identified
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		01/09/2022	

## 2. DUMML 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:*

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

#### Audit observation

The process for calculation of consumption was examined and the application of profiles was checked. The database was checked for accuracy.

#### Audit commentary

Genesis reconciles this DUMML load using the NST profile. The database extract provided in November 2021 is being used to calculate the kW figure. I checked the calculations and confirmed that the kW value matches to the most recent database extract provided. KDC advised that they are unwilling to provide monthly database extracts as they see no value in doing so.

A logger in Taupo on the Unison network is being used to calculate the burn hours and these burn hours have been applied for all available revisions since the database extract was received. This is likely to be more accurate than the previous 11.9 hours daily burn hour figure that was being used but is not accurate as it is on a different network. KDC intends to move away from the ripple relay to day light sensors in each light. I recommend that Genesis work with KDC to ensure that the correct burn hours are applied and a suitable profile is in place for submission. No time frame was given as to when this will be deployed.

The following database accuracy issues are present:

- there have been a large number of Cree lights replaced with ITRON lights during the audit period due to their high failure rate. Almost half of the light heads in the field audit were found to be incorrect. These have been unable to be updated in RAMM as the light type needs to be added. Horizon have now added this light type and an updated database extract is expected to be provided to Genesis,
- no discrepancies from the last two audits have been updated in the database.

The field audit found that in absolute terms, total annual consumption is estimated to be 14,800 kWh lower than the DUMML database indicates.

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 DUMML load and volumes.

The intermittent wattage reports are provided as a snapshot, and this is non-compliant. Genesis completes revision submissions where corrections are required. Genesis is working to develop event-based calculations, which will enable accurate volume calculations where lamps change part way through a month.

## Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.1 Clause 11(1) of Schedule 15.3  From: 25-Nov-21 To: 18-Aug-22	Actual on and off times not used to calculate consumption. Total annual consumption is estimated to be 14,800 kWh lower than the DUML database indicates, based on the field audit. The RAMM database is not being updated with changes made in the field. None of the discrepancies from the last two audits have been updated in the database including adding the lights on Anaru Drive into the database. Submission is based on a snapshot and does not consider historic adjustments. Potential impact: High Actual impact: Medium Audit history: Multiple times Controls: Weak Breach risk rating: 6		
Audit risk rating	Rationale for audit risk rating		
<b>Medium</b>	The controls are rated as weak because quality control of the database accuracy is not evident, and no progress has been made since the last audit. The impact is assessed to be medium, based on the kWh differences described above.		
Actions taken to resolve the issue		Completion date	Remedial action status
Genesis will investigate options to use accurate on and off times. Genesis Energy has discussed the discrepancies that are still outstanding and needing to be corrected with the council with an intent that KDC takes every effort to have this rectified.		01/03/2023	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	
Genesis Energy will review the dataset and provide exceptions where required. Genesis relies on KDC to accurately maintain its database.		01/03/2023	

## 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 DUMML database must contain:

- each ICP identifier for which the retailer is responsible for the DUMML
- 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

No changes have been made to the database since the last audit. Four items of load do not have an ICP recorded against them. Two are recorded as NZTA and two are blank. The two blank ones are on Fletcher Avenue.

### Audit outcome

Non-compliant

Non-compliance	Description	
Audit Ref: 2.2 With: Clause 11(2)(a) and (aa) of Schedule 15.3  From: 01-Jun-21 To: 18-Aug-22	Blank ICP field for two items of load.  Potential impact: Low  Actual impact: Low  Audit history: None  Controls: Weak  Breach risk rating: 3	
Audit risk rating	Rationale for audit risk rating	
<b>Low</b>	The controls are rated as weak. The data quality indicates a lack of quality control to check the data being loaded.  The impact is assessed to be low based on the low proportion of missing ICPs.	
Actions taken to resolve the issue		Completion date
Genesis has reviewed the auditors finding and have advised KDC of the discrepancy with the intent that KDC undertakes a full audit and updates all missing details.		01/03/2023
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.		01/03/2023
		Investigating



### 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 DUMML database must contain the location of each DUMML 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 also GPS coordinates. All items of load have 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 DUMML database must contain:

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

#### Audit observation

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

#### Audit commentary

There have been no changes made to the database since the last audit. The database contains fields for the manufacturers rated wattage and the ballast wattage. The extract provided did not have lamp or gear wattage. It is unclear if the lamp and ballast wattage fields are populated. The wattage and ballast values provided were derived by separating the wattage value out.

Recommendation	Description	Audited party comment	Remedial action
Capacity of load	Confirm that the lamp wattage and ballast fields are populated.	Genesis has reviewed the auditors finding and have advised KDC of the discrepancy with the intent that KDC provides the required information	Investigating

#### Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.4 Clause 11(2)(c)&(d) of Schedule 15.3  From: 01-Jun-21 To: 18-Aug-22	Lamp and gear wattage fields not provided for the audit.  Potential impact: Low  Actual impact: Low  Audit history: Multiple times  Controls: Weak  Breach risk rating: 3		
Audit risk rating	Rationale for audit risk rating		
<b>Low</b>	The controls are rated as weak the data quality indicates a lack of quality control to check the data being managed.  The impact is assessed to be low based on the low proportion of missing data.		
Actions taken to resolve the issue		Completion date	Remedial action status
Genesis has reviewed the auditors finding and have advised KDC of the discrepancy with the intent that KDC provides the required information		01/03/2023	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	
Genesis has reviewed the auditors finding and have advised KDC of the discrepancy with the intent that KDC provides the required information. Genesis relies on KDC to provide accurate information		01/03/2023	

## 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 210 items of load on 19<sup>th</sup> August 2022.

### Audit commentary

There were 102 field audit discrepancies, and a spreadsheet of the findings has been supplied with this report. The table below shows a summary of findings.

Finding	Quantity
Lights missing from the field	1
Incorrect wattage	101

No additional lights were found in the field. The accuracy of the field audit is discussed in **section 3.1**.

### Audit outcome

Compliant

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

### Code reference

*Clause 11(3) of Schedule 15.3*

### Code related audit information

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

### Audit observation

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

### Audit commentary

The RAMM database functionality achieves compliance with the code.

### Audit outcome

Compliant

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

### Code reference

*Clause 11(4) of Schedule 15.3*

### Code related audit information

*The DUMML 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

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	Kawerau District Council streetlights in and around Kawerau
Strata	The database contains 938 items of load in the Kawerau DC area.  The processes for the management of all Kawerau DC items of load is the same. I selected the following strata: <ul style="list-style-type: none"> <li>• roads A-F,</li> <li>• roads G-I,</li> <li>• roads J-O,</li> <li>• roads P-R and</li> <li>• roads s-Z.</li> </ul>
Area units	I created a pivot table of the roads in each database and used a random number generator in each spreadsheet to select a total of 44 sub-units.
Total items of load	210 items of load were checked.

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

##### Audit commentary

##### Database accuracy based on the field audit

A field audit was conducted of a statistical sample of 210 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	92.7	Wattage from survey is higher than the database wattage by 27.3%
R <sub>L</sub>	86.6	With a 95% level of confidence, it can be concluded that the error could be between -4.6% and -9.4%
R <sub>H</sub>	96.4	

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 4.6% and 9.4% lower than the wattage recorded in the DUML database. Non-compliance is recorded because the potential error is greater than 5.0%.

In absolute terms the installed capacity is estimated to be 3.0 kW lower than the database indicates.

There is a 95% level of confidence that the installed capacity is between 2.0 kW to 6.0 kW lower than the database.

In absolute terms, total annual consumption is estimated to be 14,800 kWh lower than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 7,300 kWh p.a. to 27,300 kWh p.a. lower than the database indicates.

Scenario	Description
<b>A - Good accuracy, good precision</b>	This scenario applies if: (a) $R_H$ is less than 1.05; and (b) $R_L$ is greater than 0.95  The conclusion from this scenario is that: (a) the best available estimate indicates that the database is accurate within +/- 5 %; and (b) this is the best outcome.
<b>B - Poor accuracy, demonstrated with statistical significance</b>	This scenario applies if: (a) the point estimate of R is less than 0.95 or greater than 1.05 (b) as a result, either $R_L$ is less than 0.95 or $R_H$ is greater than 1.05.  There is evidence to support this finding. In statistical terms, the inaccuracy is statistically significant at the 95% level
<b>C - Poor precision</b>	This scenario applies if: (a) the point estimate of R is between 0.95 and 1.05 (b) $R_L$ is less than 0.95 and/or $R_H$ is greater than 1.05  The conclusion from this scenario is that the best available estimate is not precise enough to conclude that the database is accurate within +/- 5 %

#### Lamp description and capacity accuracy

The database was checked against the published standardised wattage table.

As detailed in **section 2.4**, lamp wattages were unable to be checked because they were not provided for the audit.

As recorded in the last two audits, festive lights are connected to the unmetered streetlight circuits but are not tracked in RAMM. I was unable to determine the specific impact on reconciliation, but the volume of lights associated with this is small. I am repeating the recommendation to maintain visibility.

Description	Recommendation	Audited party comment	Remedial action
Database accuracy	Record festive lights in RAMM.	Genesis has reviewed the auditors finding and will advise KDC of the discrepancy with the intent that KDC undertakes a full audit and updates all details as required.	Investigating

### NZTA lighting

NZTA lighting is included in the database for the urban area and was checked as part of the field audit.

### ICP accuracy

As detailed in **section 2.2**, there are two items of load with no ICP recorded. This is recorded as non-compliance below.

### Location accuracy

The database contains fields for the street address and also GPS coordinates and all were populated.

### Change management process findings

The processes were reviewed for ensuring that changes in the field are captured. The field work and database management are carried out by Horizon. WSP no longer have any involvement in the management of this database. There have been a large number of Cree lights replaced with ITRON lights during the audit period due to their high failure rate. These have been unable to be updated in RAMM as the light type needs to be added. Horizon have now added this light type and an updated database extract is expected to be provided to Genesis.

As reported in the last audit, there are two new areas where the lights are not all recorded against the new roads. The roads are Piripiri Cres and Tiwhatiwha Cres. The new connection process needs to be reviewed to ensure that acceptance of new streetlights from the trader is gained prior to these being electrically connected. As Horizon is both the network and the database management contractor this should be able to be put in place. I recommend that Genesis liaise with KDC and Horizon to get this in place.

Description	Recommendation	Audited party comment	Remedial action
Database accuracy	Liaise with KDC and Horizon to ensure new streetlights are accepted by the trader prior to them being electrically connected.	Genesis Energy will look to review the new connection process with the council with the aim that new roads are been added within a timely manner	Investigating

The last audit noted that a full field audit was conducted by KDC, and the results were updated into the database. This audit, as did the last, found a high volume of errors suggesting that the last field audit did not accurately capture the lighting load. I repeat the last audit's recommendation that a full field audit is undertaken to bring the database up to date.

Description	Recommendation	Audited party comment	Remedial action
Database accuracy	Undertake full field audit.	Genesis has discussed with KDC the importance of conducting a full audit with an intent that they carry it out at the earliest.	Investigating

As recorded in the last audit identified 26 new 85-watt LED lights on Anaru Drive and the intersection of Anaru Drive and Kawerau Rd. 17 of these lights may be the responsibility of NZTA which is subject to a different audit but there are nine which are not on the highway and will be the responsibility of KDC. None of these have been added to the database, leading to a potential under submission of 3,267 kWh per annum.

KDC have fortnightly outage patrols in place. The frequency of these patrols is expected to be extended once the Cree lights that are failing have been replaced.

There are no known private lights connected.

#### **Audit outcome**

Non-compliant



Non-compliance	Description		
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b)  From: 01-Jun-21 To: 18-Aug-22	Database accuracy is outside the allowable +/-5% threshold resulting in an estimated over submission of 14,800 kWh per annum. Lamp and gear wattages not provided for the audit. Two items of load without ICPs. Festive lighting is connected but the volume is not recorded. The RAMM database is not being updated with changes made in the field. None of the discrepancies from the last two audits have been updated in the database including adding the lights on Anaru Drive into the database. Potential impact: High Actual impact: Medium Audit history: Multiple times Controls: Weak Breach risk rating: 6		
Audit risk rating	Rationale for audit risk rating		
<b>Medium</b>	The controls are rated as weak because quality control of the database accuracy is not evident and no progress has been made since the last audit. The impact is assessed to be medium, based on the kWh differences described above.		
Actions taken to resolve the issue		Completion date	Remedial action status
Genesis Energy has advised council of the auditor's findings regarding missing information, with the intent that the council makes every effort to ensure that exceptions are rectified		01/03/2023	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	
Genesis continues to work with the council to increase accuracy levels within their database. Genesis relies on KDC to accurately maintain its 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 the ICP has the correct profile and submission flag, and
- checking the database extract combined with the burn hours against the submitted figure to confirm accuracy.

### Audit commentary

Genesis reconciles this DUML load using the NST profile. The database extract provided in November 2021 is being used to calculate the kW figure. I checked the calculations and confirmed that the kW value matches to the most recent database extract provided. KDC advised that they are unwilling to provide monthly database extracts as they see no value in doing so.

A logger in Taupo on the Unison network is being used to calculate the burn hours and these burn hours have been applied for all available revisions since the database extract was received. This is likely to be more accurate than the previous 11.9 hours daily burn hour figure that was being used but is not accurate as it is on a different network. KDC intends to move away from the ripple relay to day light sensors in each light. I recommend that Genesis work with KDC to ensure that the correct burn hours are applied and a suitable profile is in place for submission. No time frame was given as to when this will be deployed.

The following database accuracy issues are present:

- there have been a large number of Cree lights replaced with ITRON lights during the audit period due to their high failure rate. Almost half of the light heads in the field audit were found to be incorrect. These have been unable to be updated in RAMM as the light type needs to be added. Horizon have now added this light type and an updated database extract is expected to be provided to Genesis,
- no discrepancies from the last two audits have been updated in the database.

The field audit found that in absolute terms, total annual consumption is estimated to be 14,800 kWh lower than the DUML database indicates.

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 is non-compliant. Genesis completes revision submissions where corrections are required. Genesis is working to develop event-based calculations, which will enable accurate volume calculations where lamps change part way through a month.

### Audit outcome

Non-compliant

Non-compliance	Description		
<p>Audit Ref: 3.2 Clause 15.2 and 15.37B(c)</p> <p>From: 25-Nov-21 To: 18-Aug-22</p>	<p>Actual on and off times not used to calculate consumption.</p> <p>Total annual consumption is estimated to be 14,800 kWh lower than the DUMML database indicates, based on the field audit.</p> <p>The RAMM database is not being updated with changes made in the field.</p> <p>None of the discrepancies from the last two audits have been updated in the database including adding the lights on Anaru Drive into the database.</p> <p>Submission is based on a snapshot and does not consider historic adjustments.</p> <p>Potential impact: High Actual impact: Medium Audit history: Multiple times Controls: Weak Breach risk rating: 6</p>		
Audit risk rating	Rationale for audit risk rating		
<p><b>Medium</b></p>	<p>The controls are rated as weak because quality control of the database accuracy is not evident.</p> <p>The impact is assessed to be medium, based on the kWh differences described above.</p>		
Actions taken to resolve the issue		Completion date	Remedial action status
<p>Genesis will investigate options to use accurate on and off times. Genesis Energy has discussed the discrepancies that are still outstanding and needing to be corrected with the council with an intent that KDC takes every effort to have this rectified.</p>		<p>01/03/2023</p>	<p>Investigating</p>
Preventative actions taken to ensure no further issues will occur		Completion date	
<p>Genesis Energy will review the dataset and provide exceptions where required. Genesis relies on KDC to accurately maintain its database.</p>		<p>01/03/2023</p>	

## CONCLUSION

The scope of the audit encompasses the collection, security and accuracy of the data, including the preparation of submission information. The field work and management of the RAMM database is carried out by Horizon. WPS (formerly Opus) no longer has any involvement in the KDC database. There have been a large number of Cree lights replaced with ITRON lights during the audit period due to their high failure rate. These have been unable to be updated in RAMM as the light type needs to be added. Horizon have now added this light type and an updated database extract is expected to be provided to Genesis. Genesis have requested monthly database extracts but KDC see no value in doing so. The increased error rate has resulted in an increase in the estimated annual over submission of volume for this streetlight load from 5,800 kWh to 14,800 kWh.

As reported in the last audit, there is a high error rate and errors found in the last two audits have not been corrected. I repeat the recommendation that a full field audit is undertaken to correct the data set. This will ensure that KDC is billed correctly and submissions to the market are accurate.

This audit found seven non-compliances and makes four recommendations. The future risk rating of 30 indicates that the next audit be completed in three months.

## PARTICIPANT RESPONSE

Genesis contacted the council and discussed discrepancies. Genesis Energy continues to work with the council to improve data accuracy and mitigate the risk surrounding +/- settlement submissions with the intent that council makes every effort to ensure the exceptions are rectified.