ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

For

OTOROHANGA DISTRICT COUNCIL
AND GENESIS ENERGY LIMITED

Prepared by: Rebecca Elliot

Date audit commenced: 5 May 2022

Date audit report completed: 20 May 2022

Audit report due date: 1 June 2022

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EXECUTIVE SUMMARY

This audit of the **Otorohanga District Council (ODC)** 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 ODC, who is Genesis' customer. RATA (Waikato Regional Asset Technical Accord) provides technical support for RAMM road asset information as a shared service across the Waikato region.

A monthly report is expected to be sent but none has been received since October 2021. I compared the May 2022 extract with the October 2021 extract and found no differences. I recommend Genesis follow this up with RATA to ensure that extracts are sent.

The NZTA lights reconciled in this database are also being reconciled by NZTA in their RAMM database. This is estimated to be resulting in 104,930 kWh of over submission to the market per annum. Genesis is the trader for both ODC and NZTA. I recommend that they work with the customers to determine which database these lights are to be reconciled to and process revisions accordingly.

The ODC NZTA lights are spread across the both the Lines Company and Waipa Networks but are only being reconciled to the Lines Company network. I identified 22 lights that are likely to be on the Waipa network. This will be resulting in an estimated 19,540 kWh per annum being reconciled and billed to the incorrect network.

Database accuracy is described as follows:

Result	Percentage	Comments
The point estimate of R	106.7	Wattage from survey is higher than the database wattage by 6.7%
R_L	101.6	With a 95% level of confidence, it can be concluded that the error could be between 1.6% and 11.7%
R_H	111.7	

The conclusion from Scenario C is that the variability of the sample results across the strata could mean that the true wattage (installed in the field) could be between 1.6% to 11.7% higher than the wattage recorded in the DUML database. Non-compliance is recorded because the potential error is greater than 5.0%.

- In absolute terms the installed capacity is estimated to be 2 kW higher than the database indicates.
- There is a 95% level of confidence that the installed capacity is between 1 and 4 kW higher than the database.
- In absolute terms, total annual consumption is estimated to be 10,400 kWh higher than the DUML database indicates.
- There is a 95% level of confidence that the annual consumption is between 2,500 to 18,000 kWh p.a. higher than the database indicates.

The audit found five non-compliances and makes four recommendations. The future risk rating of 31 indicates that the next audit be completed in three months. I have considered this in conjunction with Genesis' comments and recommend that the next audit be due six months from the last audit due date.

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 resulting in an estimated annual under submission of 10,400 kWh. NZTA lights are being submitted by both ODC and NZTA resulting in 104,930 kWh of over submission. An estimated 22 NZTA lights or 19,540 kWh per annum are reconciled to the Lines Company network instead of the Waipa network. Festive lights are included throughout the year resulting in an estimated annual over submission of 812 kWh. Some decorative and festive lights are not recorded in the database. Submission is based on a snapshot and does not consider historic adjustments.	Weak	High	9	Identified
Description and capacity of load	2.4	11(2)(c) and (d) of Schedule 15.3	Pole ID 741 with no lamp make, model or wattage recorded.	Strong	Low	1	Identified
All load recorded in database	2.5	11(2A) of Schedule 15.3	Three additional items of load found in the field. Some decorative and festive lights are not recorded in the database.	Weak	Low	3	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 resulting in an estimated annual under submission of 10,400 kWh. NZTA lights are being submitted by both ODC and NZTA resulting in 104,930 kWh of over submission. An estimated 22 NZTA lights or 19,540 kWh per annum are reconciled to the Lines Company network instead of the Waipa network. Pole ID 741 with no lamp make, model or wattage recorded. Festive lights are included throughout the year resulting in an estimated annual over submission of 812 kWh. Some decorative and festive lights are not recorded in the database.	Weak	High	9	Identified
Volume information accuracy	3.2	15.2 and 15.37B(c)	The database is not confirmed as accurate with a 95% level of confidence resulting in an estimated annual under submission of 10,400 kWh. NZTA lights are being submitted by both ODC and NZTA resulting in 104,930 kWh of over submission. An estimated 22 NZTA lights or 19,540 kWh per annum are reconciled to the Lines Company network instead of the Waipa network. Festive lights are included throughout the year resulting in an estimated annual over submission of 812 kWh. Some decorative and festive lights are not recorded in the database. Submission is based on a snapshot and does not consider historic adjustments.	Weak	High	9	Identified
Future Risk Rating						31	

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
Deriving submission information	2.1	Ensure monthly reports are being received from RATA.
		Identify all unmetered festive and decorative lights, confirm their wattages, and update RAMM. If the lights are not connected year-round, communicate the on and off times to Genesis, so that the lights are correctly included in submission information when connected, and excluded from submission information when disconnected.
Database Accuracy	3.1	Determine which database the NZTA streetlights are to be reconciled to and process corrections accordingly.
		Investigate the NZTA load for the ODC area to ensure that it is reconciled to the correct ICP and therefore network.

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

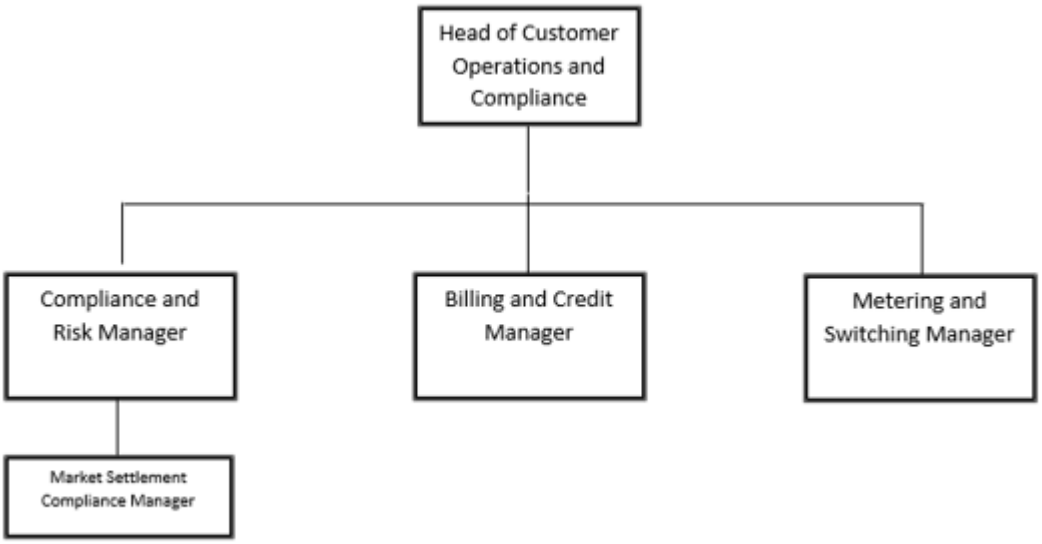
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

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
Andreas Senger	Roading Manager	Otorohonga District Council
Cameron Senior	Asset Information Engineer – RATA	RATA – Waikato Regional Asset Technical Accord
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 Ltd. The database is commonly known as “RAMM” which stands for “Roading Asset and Maintenance Management”.

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)
0000400332WA74B	Te Kawa	TMU0111	STL	3	66
0000400337WAA04	OPARAU/AOTEA S/LTS	TMU0111	STL	10	220
0000400341WAED6	Kawhia	TMU0111	STL	114	2,478
0001111170WMD3F	State Highway Urban	HTI0331	STL	147	24,568
0008807415WMBD6	Local Authority Streetlights	HTI0331	STL	399	8,798
Total				**673**	**36,130**

The NZTA lights are also recorded in the NZTA Waikato database and will therefore being submitted twice. I recommend in **section 3.1**, that Genesis work with NZTA and the council to resolve this.

1.7. Authorisation Received

All information was provided directly by Genesis, ODC and RATA – Waikato Regional Asset Technical Accord.

1.8. Scope of Audit

This audit of the ODC 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.

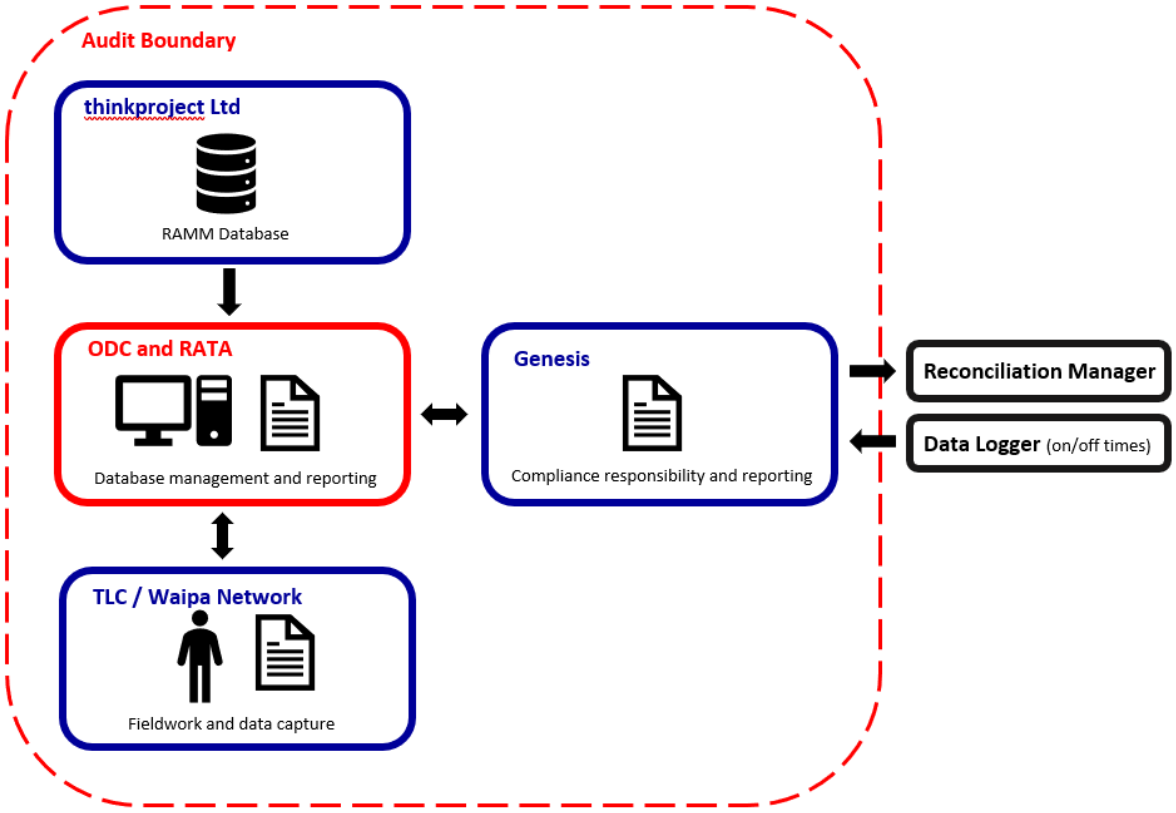
A RAMM database is held by ODC, who is Genesis' customer. RATA (Waikato Regional Asset Technical Accord) provides technical support for RAMM road asset information as a shared service across the Waikato region.

New connections are managed by the relevant networks.

ODC are not renewing the contract with The Lines Company for field maintenance. The streetlight load is now all LED with the exception of NZTA lights which ODC do not maintain. Maintenance going forward will be undertaken on a job-by-job basis with the work being issued to either The Lines Company or Waipa Network depending on which network the light/s are located. Outage patrols will continue to be undertaken by ODC every six months.

A monthly report from the database is expected to be provided to Genesis by ODC. This is used to calculate submissions. If no report is received, then the latest report is used. Genesis reconciles the DUML load as NHH using the NST profile, and on and off times are derived from data logger information.

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 137 items of load on 19 May 2022.

1.9. Summary of previous audit

The previous audit was completed in November 2020 by Tara Gannon of Veritek Limited. The current status of that audit's findings is detailed below.

Table of Non-compliance

Subject	Section	Clause	Non-compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	203W relating to festive lights was included in the August 2020 submission when the lights were disconnected. Some decorative and festive lights are not recorded in the database.	Still existing
All load recorded in database	2.5	11(2A) of Schedule 15.3	Three additional items of load found in the field. Some decorative and festive lights are not recorded in the database.	Still existing

Subject	Section	Clause	Non-compliance	Status
Database accuracy	3.1	15.2 and 15.37B(b)	Some decorative and festive lights are not recorded in the database.	Still existing
Volume information accuracy	3.2	15.2 and 15.37B(c)	203W relating to festive lights was included in the August 2020 submission when the lights were disconnected. Some decorative and festive lights are not recorded in the database.	Still existing

Table of Recommendations

Subject	Section	Recommendation for Improvement	Status
Festive and decorative lights	2.1	Identify all unmetered festive and decorative lights, confirm their wattages, and update RAMM. If the lights are not connected year-round, communicate the on and off times to Genesis, so that the lights are correctly included in submission information when connected, and excluded from submission information when disconnected.	Repeated
Tracking of load changes for NZTA lights	3.1	Develop a process to ensure that all NZTA lights are accurately recorded in the database, and changes are captured.	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 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 database accuracy assessed.

Audit commentary

Genesis reconciles the DUML load as NHH using the NST profile. A RAMM extract is expected to be sent each month, but none has been received since October 2021. On and off times are derived from a data logger.

A monthly report is expected to be sent but none has been received since October 2021. I recommend below that Genesis follow this up with RATA. I compared the May 2022 extract with the October 2021 extract and found no differences. I recalculated the submissions for May 2022 using the data logger and the database information and the submission figures matched.

Recommendation	Description	Audited party comment	Remedial action
Deriving submission information	Ensure monthly reports are being received from RATA.	Genesis has advised the ODC that we require monthly data extracts to reconcile the consumption correctly.	Investigating

The NZTA lights reconciled in this database are also being reconciled by NZTA in their RAMM database. I detail in **section 3.1**, where it appears the duplication is occurring. This is estimated to be resulting in 104,930 kWh of over submission to the market per annum. Genesis is the trader for both ODC and NZTA. I recommend in **section 3.1**, that Genesis work with the customers to determine which database these lights are to be reconciled to and process revisions accordingly.

The ODC NZTA lights are spread across the both the Lines Company and Waipa Networks but are only being reconciled to the Lines Company network. I identified 22 lights north of Kio Kio Station Road that are likely to be on the Waipa network. This will be resulting in an estimated 19,540 kWh per annum being reconciled and billed to the incorrect network.

As reported in the last audit, festive lights for Maniapoto Street were added to the database following the 2019 audit; and are connected from 1 December until 31 January each year. The festive lights continue to be included throughout the year resulting in an estimated over submission of 812 kWh per annum, which is recorded as non-compliance below and in **sections 3.1** and **3.2**.

As reported in the last two audits, some other festive and decorative lights are not recorded in the database; and were therefore excluded from submission information.

- The 2019 audit found that decorative LED lights in the redwood trees on Maniapoto Street, Otorohanga were not recorded in the database. These lights are thought to have been donated to the community by The Lines Company, but they do not appear to be recorded in any database, therefore submission may not be occurring for them.

- During the 2020 field audit, five LED strings of festive lights were located on Jervois Street, Kawhia which were not recorded in the database. I confirmed they are still present in the field. I repeat the last audit's recommendation to get these added to the database.

Recommendation	Description	Audited party comment	Remedial action
Festive and decorative lights	Identify all unmetered festive and decorative lights, confirm their wattages, and update RAMM. If the lights are not connected year-round, communicate the on and off times to Genesis, so that the lights are correctly included in submission information when connected, and excluded from submission information when disconnected.	Genesis has advised of ODC of the audit finding with the intent that the data base be updated to reflect this. ODC has also been advised to advise Genesis of the on and off times of these festive lights.	Investigating

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
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 12-Nov-20 To: 05-May-22	The database is not confirmed as accurate with a 95% level of confidence resulting in an estimated annual under submission of 10,400 kWh. NZTA lights being submitted by both ODC and NZTA resulting in 104,930 kWh of over submission. An estimated 22 NZTA lights or 19,540 kWh per annum reconciled to the Lines Company network instead of the Waipa network. Festive lights are included throughout the year resulting in an estimated annual over submission of 812 kWh. Some decorative and festive lights are not recorded in the database. Submission is based on a snapshot and does not consider historic adjustments. Potential impact: High Actual impact: High Audit history: Twice previously Controls: Weak Breach risk rating: 9
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as weak as the controls in place to manage the deriving of submission should have identified the duplication of load being submitted. The impact is assessed to be high based on the kWh impact to the market.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis has completed a review of the NZTA Waikato data base and are now currently in the process of comparing this to ODC. Once this comparison has been completed genesis will look to revise the submissions. Genesis will investigate the over submission of the festive lights and confirm with ODC the on and off times with the intent to reconceal this consumption going back 14mths Genesis has advised the ODC of the importance of tracking of change and will work with ODC to improve this process.	01/09/2022 Continuous improvement	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Genesis continues to work with the council to raise database accuracy levels.	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 is recorded for each item of load.

Audit commentary

All items of load had an ICP recorded as required by this clause. I recommend in **section 3.1**, that the ICP allocation for the NZTA streetlights is reviewed as these are being reconciled to different ICPs and in some cases different NSPs and therefore networks.

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 road names, displacements, and Global Positioning System (GPS) coordinates.

GPS coordinates are populated for 664 of the 673 items of load, and the remaining items have sufficient location information to enable them to be readily located.

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 fields for lamp make, lamp model, lamp wattage and gear wattage.

All items of load had a valid description, lamp wattage and gear wattage apart from pole ID 741. This is a spotlight in a park with an installation date of 16 November 2020 and has no lamp make, model or wattage recorded. This will be resulting in a very minor amount of under submission. This recorded as non-compliance below and in **sections 2.1, 3.1** and **3.2**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.4 With: Clause 11(2)(c) and (d) of Schedule 15.3 From: 12-Nov-20 To: 05-May-22	Pole ID 741 with no lamp make, model or wattage recorded. 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 overall as they will mitigate risk to an acceptable level. The impact is assessed to be low, as the amount of under submission caused by one light is very minor.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis has discussed the audit findings with the ODC with the intent that 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 continues to work with the council to raise database accuracy levels.	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 137 items of load on 19 May 2022. The sample was selected from five relatively similar sized strata:

1. NZTA SH 31 Kawhia/Otorohonga & SH 3 Otorohonga,
2. ODC streets A-L,
3. ODC streets M-W,
4. NZTA SH3 Main Road North, and
5. NZTA SH3 Maniapoto St.

Audit commentary

The field audit discrepancies are detailed in the table below:

Street	Database count	Field count	Light count difference	Wattage recorded incorrectly	Comments
HINEWAI ST	21	21		1	1x 21W LED was recorded as 22W LED in the database.
HUIPUTEA DR Section 1	15	14	-1	-	1x 22W LED not found in the field (before rail bridge at the South end of road).
MAIN NORTH RD (SH 3) Section 2	16	16		4	4x 150W HPS recorded as 1x 70W HPS and 3x 37W LED in the database.
RANGIPARE ST	5	7	+2	-	2x additional 21W LED found in the field but not recorded in the database.
TE KANAWA ST (SH 31) Section 2	9	10	+1	1	1x additional 150W HPS found in the field on the corner of Rangipare St and Te Kanawa Rd. 1x 150W HPS recorded as 100W HPS in the database.
Grand Total	**137**	**137**	**4 (-1+3)**	**7**	

Three additional items of load were found in the field audit and are recorded as non-compliance below.

As reported in the last two audits, some other festive and decorative lights are not recorded in the database; and were therefore excluded from submission information.

- The 2019 audit found that decorative LED lights in the redwood trees on Maniapoto Street, Otorohanga were not recorded in the database. These lights are thought to have been donated to the community by The Lines Company, but they do not appear to be recorded in any database, therefore submission may not be occurring for them.
- During the 2020 field audit, five LED strings of festive lights were located on Jervois Street, Kawhia which were not recorded in the database. I confirmed they are still present in the field. I repeat the last audit's recommendation to get these added to the database.

I have repeated the recommendation made in **section 2.1** to identify all unmetered festive and decorative lights, confirm their wattages, and update RAMM. If the lights are not connected year-round, the on and off dates should be communicated to Genesis, so that the lights are correctly included in submission information when connected and excluded from submission information when disconnected.

Audit outcome

Non-compliant

<table>
<tr><th>Non-compliance</th><th colspan="3">Description</th></tr>
<tr><td>Audit Ref: 2.5
With: Clause 11(2A) of Schedule 15.3

From: unknown
To: 05-May-22</td><td colspan="3">Three additional items of load found in the field.
Some decorative and festive lights are not recorded in the database.
Potential impact: Low
Actual impact: Low
Audit history: Twice previously
Controls: Weak
Breach risk rating: 3</td></tr>
<tr><th>Audit risk rating</th><th colspan="3">Rationale for audit risk rating</th></tr>
<tr><td>Low</td><td colspan="3">The controls are rated as weak overall as the controls in place are not robust enough to ensure that all load is recorded in the database.
The impact is assessed to be low, as the kWh impact on reconciliation is expected to be small.</td></tr>
<tr><th colspan="2">Actions taken to resolve the issue</th><th>Completion date</th><th>Remedial action status</th></tr>
<tr><td colspan="2">Genesis has discussed the audit findings with the ODC with the intent that council makes every effort to ensure the exceptions are rectified.</td><td>Continuous improvement</td><td rowspan="3">Identified</td></tr>
<tr><th colspan="2">Preventative actions taken to ensure no further issues will occur</th><th>Completion date</th></tr>
<tr><td colspan="2">Genesis continues to work with the council to raise database accuracy levels.</td><td>Continuous improvement</td></tr>
</table>

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 a monthly extract from the RAMM database. A RAMM database extract was provided in May 2022, 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	Otorohanga district
Strata	The database contains items of load in the Otorohanga area, recorded against five ICPs. The processes for the management of ODC items of load are the same, but I decided to place the items of load into five relatively similar sized strata: 1. NZTA SH 31 Kawhia/Otorohonga & SH 3 Otorohonga, 2. ODC streets A-L, 3. ODC streets M-W, 4. NZTA SH3 Main Road North, and 5. NZTA SH3 Maniapoto St.
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 23 sub-units or 20% of the database wattage.
Total items of load	137 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 field audit was conducted of a statistical sample of 137 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	106.7	Wattage from survey is higher than the database wattage by 6.7%
R_L	101.6	With a 95% level of confidence, it can be concluded that the error could be between 1.6% and 11.7%
R_H	111.7	

The conclusion from Scenario C is that the variability of the sample results across the strata could mean that the true wattage (installed in the field) could be between 1.6% to 11.7% higher than the wattage recorded in the DUML database. Non-compliance is recorded because the potential error is greater than 5.0%.

- In absolute terms the installed capacity is estimated to be 2 kW higher than the database indicates.
- There is a 95% level of confidence that the installed capacity is between 1 and 4 kW higher than the database.
- In absolute terms, total annual consumption is estimated to be 10,400 kWh higher than the DUML database indicates.
- There is a 95% level of confidence that the annual consumption is between 2,500 to 18,000 kWh p.a. higher than the database indicates.

Scenario	Description
A - **Good accuracy, good precision**	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 - **Poor accuracy, demonstrated with statistical significance**	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
C - **Poor precision**	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 %

Light description and capacity accuracy

All items of load had a valid description, lamp wattage and gear wattage apart from pole ID 741. This is a spotlight in a park with an installation date of 16 November 2020 and has no lamp make, model or wattage recorded. This will be resulting in a very minor amount of under submission. This recorded as non-compliance below and in **sections 2.1** and **3.2**.

Lamp and gear wattages were compared to the expected values and confirmed all were correct.

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

As discussed in **section 2.2**, all items of load have an ICP number recorded. I recommend below, that the ICP allocation for the NZTA streetlights is reviewed as these are being reconciled to different ICPs and in some cases different NSPs and therefore networks.

NZTA lights

NZTA have a project underway to remove their lighting from local council databases. The NZTA load recorded in the ODC database is also being reconciled by NZTA under ICPs 0000400344WA399 (TMU0111), 0000400320WAD63 (TMU0111) and 0008806768WM373 (HTI 0331). This is estimated to be resulting in 104,930 kWh of over submission to the market per annum. Genesis is the trader for both ODC and NZTA. I recommend below that Genesis work with the customers to determine which database these lights are to be reconciled to and process revisions accordingly.

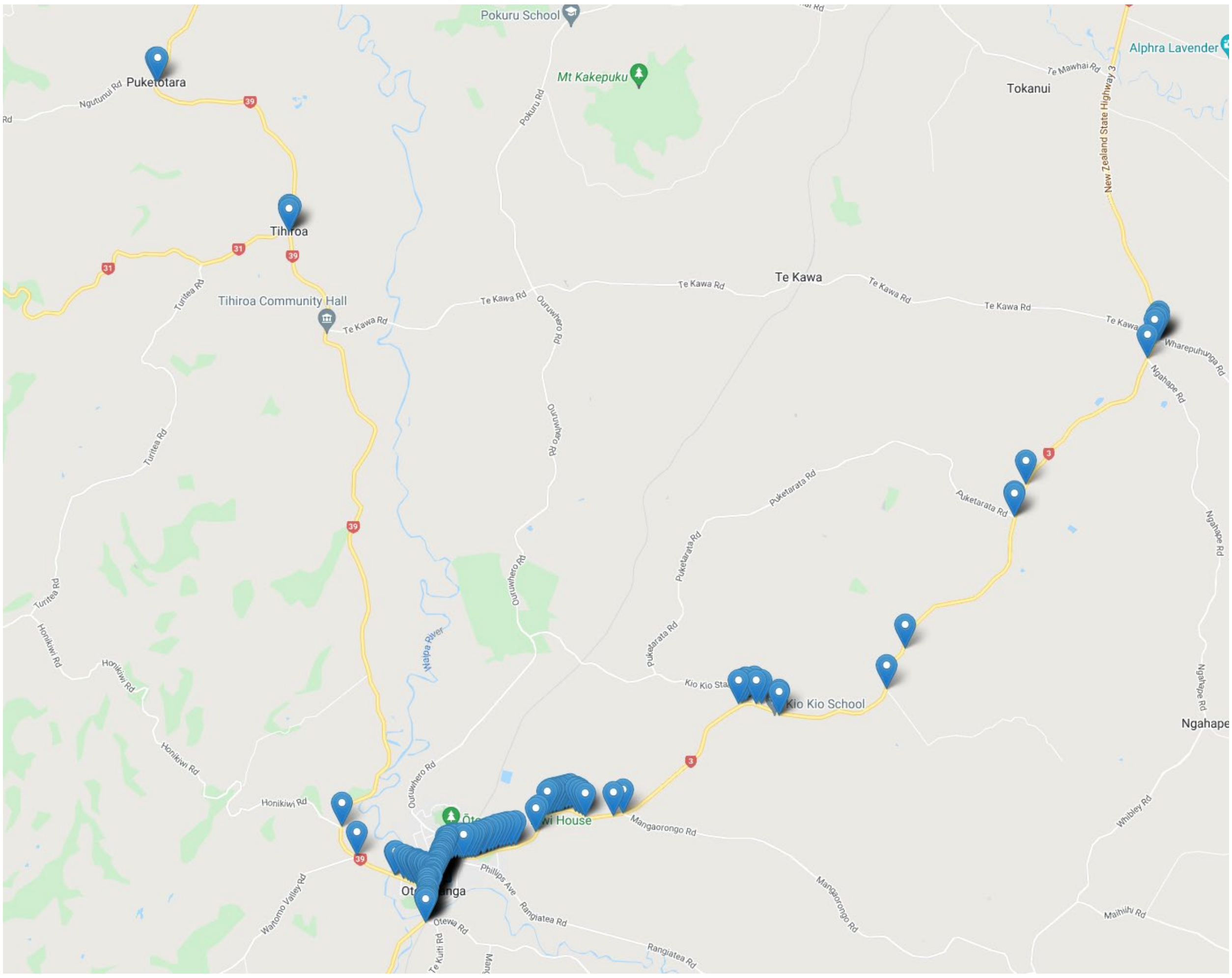
Recommendation	Description	Audited party comment	Remedial action
Database accuracy	Determine which database the NZTA streetlights are to be reconciled to and process corrections accordingly.	Genesis has completed a review of the NZTA Waikato data base and are now currently in the process of comparing this to ODC. Once this comparison has been completed genesis will look to revise the submissions.	Identified

The ODC NZTA lights are spread across the both the Lines Company and Waipa Networks but are only being reconciled to the Lines Company network. I identified 22 lights that are likely to be on the Waipa network. This will be resulting in an estimated 19,540 kWh per annum being reconciled and billed to the incorrect network.

Recommendation	Description	Audited party comment	Remedial action
Database accuracy	Investigate the NZTA load for the ODC area to ensure that it is reconciled to the correct ICP and therefore network.	Genesis has completed a review of the NZTA Waikato data base and are now currently in the process of comparing this to ODC. Once this comparison has been completed genesis will look to revise the submissions.	Identified

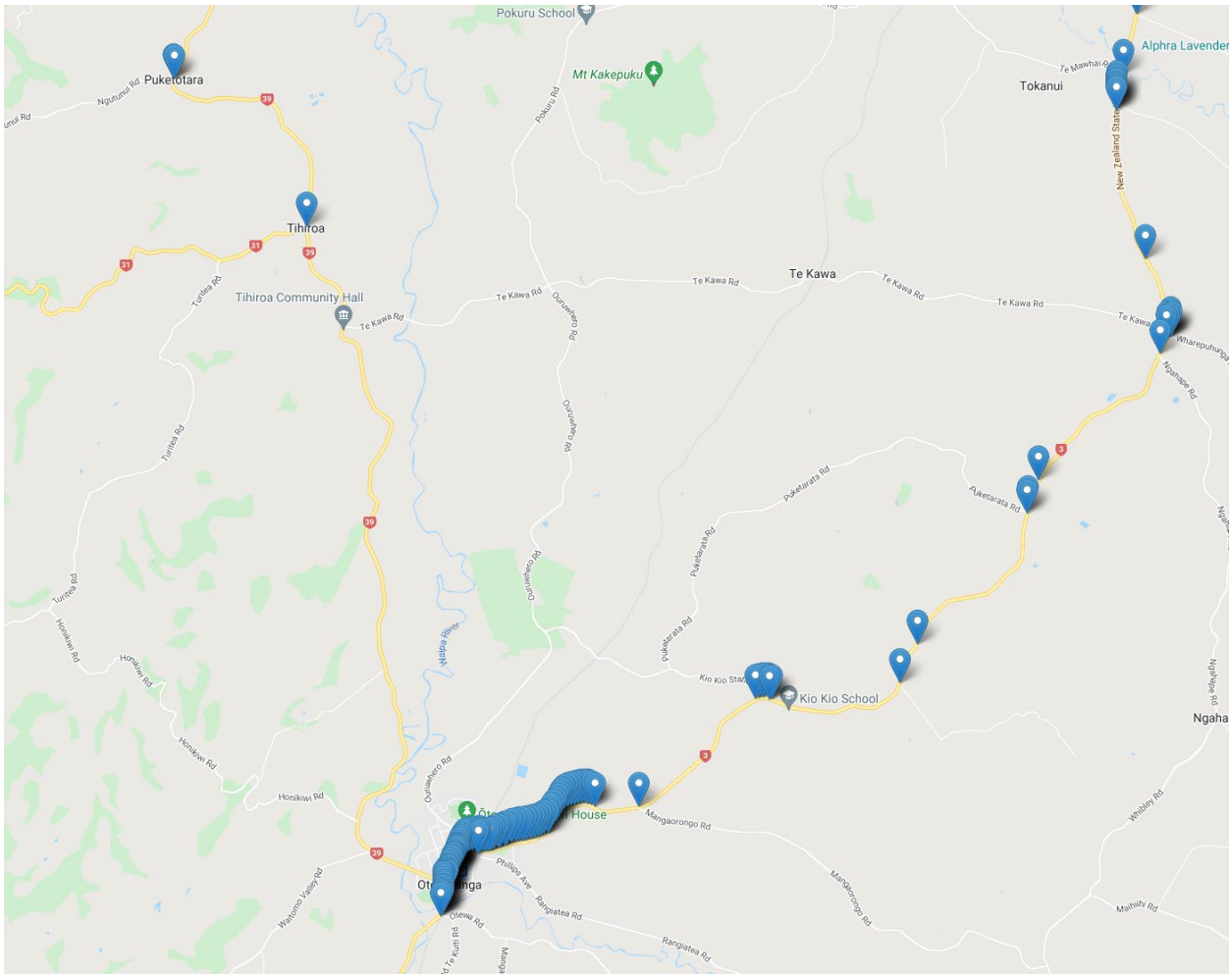
I have mapped both sets of lights for visual reference below:

ODC



Pokuru School
Mt Kakepuku
Alphra Lavender
Puketotara
Tokanui
Tihiroa
Tihiroa Community Hall
Te Kawa
Kio Kio School
Ngahape

NZTA



Change management process findings

ODC use a RAMM database to manage this DUML load. RATA (Waikato Regional Asset Technical Accord) provides technical support for RAMM road asset information as a shared service across the Waikato region.

New connections are managed by the relevant network. Each network has their own process. New subdivisions are rare but there is one due to come on stream in the next year. ODC have invested in this, and the process is expected to be unchanged with the network confirming acceptance of the additional streetlights prior to the street light circuit being electrically connected.

ODC are not renewing the field maintenance contract with The Lines Company. The streetlight load is now all LED with the exception of NZTA lights which ODC do not maintain. As detailed above ODC will work with Genesis to determine if these lights continue to be reconciled for this database or not. Going forward Maintenance will be undertaken on a job-by-job basis with the work being issued to either The Lines Company or Waipa Network depending on which network the light/s are located. Any changes made in the field will be provided back to ODC to be loaded into RAMM. Due to the invoicing process this may not occur within the calendar month the change occurs.

Outage patrols will continue to be undertaken by ODC every six months, and residents also report faulty streetlights.

ODC have completed the LED roll out, and no CMS system is installed or planned.

Festive and decorative lights

As reported in the last audit, festive lights for Maniapoto Street were added to the database following the 2019 audit; and are connected from 1 December until 31 January each year. The festive lights continue to be included throughout the year resulting in an estimated over submission of 812 kWh per annum, which is recorded as non-compliance below and in **sections 2.1** and **3.2**.

As reported in the last two audits, some other festive and decorative lights are not recorded in the database; and were therefore excluded from submission information.

- The 2019 audit found that decorative LED lights in the redwood trees on Maniapoto Street, Otorohanga were not recorded in the database. These lights are thought to have been donated to the community by The Lines Company, but they do not appear to be recorded in any database, therefore submission may not be occurring for them.
- During the 2020 field audit, five LED strings of festive lights were located on Jervois Street, Kawhia which were not recorded in the database. I confirmed they are still present in the field.

I repeat the last audit's recommendation in **section 2.1** to identify all unmetered festive and decorative lights, confirm their wattages, and update RAMM. If the lights are not connected year-round, the on and off dates should be communicated to Genesis, so that the lights are correctly included in submission information when connected and excluded from submission information when disconnected.

Private lights

Three private lights are recorded in the database. The private lights are paid for by ODC and have the correct ICP number assigned which ensures that they are included in Genesis' reconciliation submissions as part of the DUML load.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 12-Nov-20 To: 05-May-22	The database is not confirmed as accurate with a 95% level of confidence resulting in an estimated annual under submission of 10,400 kWh. NZTA lights being submitted by both ODC and NZTA resulting in 104,930 kWh of over submission. An estimated 22 NZTA lights or 19,540 kWh per annum reconciled to the Lines Company network instead of the Waipa network. Pole ID 741 with no lamp make, model or wattage recorded. Festive lights are included throughout the year resulting in an estimated annual over submission of 812 kWh. Some decorative and festive lights are not recorded in the database. Potential impact: High Actual impact: High Audit history: Three times previously Controls: Weak Breach risk rating: 9
Audit risk rating	**Rationale for audit risk rating**
High	Controls are rated as weak as the processes in place do not sufficiently mitigate risk and the recommendations made in the last audit have not been adopted. The impact is assessed to be high based on the kWh impact to the market.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis has completed a review of the NZTA Waikato data base and are now currently in the process of comparing this to ODC. Once this comparison has been completed genesis will look to revise the submissions. Genesis will investigate the over submission of the festive lights and confirm with ODC the on and off times with the intent to reconceal this consumption going back 14mths	01/09/2022 Continuous improvement	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Genesis continues to work with the council to raise database accuracy levels.	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 on hours against the submitted figure to confirm accuracy.

Audit commentary

Genesis reconciles the DUML load as NHH using the NST profile. A RAMM extract is expected to be sent each month, but none has been received since October 2021. On and off times are derived from a data logger.

A monthly report is expected to be sent but none has been received since October 2021. I recommend in **section 2.1**, that Genesis follow this up with RATA. I compared the May 2022 extract with the October 2021 extract and found no differences. I recalculated the submissions for May 2022 using the data logger and the database information and the submission figures matched.

The NZTA lights reconciled in this database are also being reconciled by NZTA in their RAMM database. I detail in **section 3.1**, where it appears the duplication is occurring. This is estimated to be resulting in 104,930 kWh of over submission to the market per annum. Genesis is the trader for both ODC and NZTA. I recommend in **section 3.1**, that Genesis work with the customers to determine which database these lights are to be reconciled to and process revisions accordingly.

The ODC NZTA lights are spread across the both the Lines Company and Waipa Networks but are only being reconciled to the Lines Company network. I identified 22 lights north of Kio Kio Station Road that are likely to be on the Waipa network. This will be resulting in an estimated 19,540 kWh per annum being reconciled and billed to the incorrect network.

As reported in the last audit, festive lights for Maniapoto Street were added to the database following the 2019 audit; and are connected from 1 December until 31 January each year. The festive lights continue to be included throughout the year resulting in an estimated over submission of 812 kWh per annum, which is recorded as non-compliance below and in **sections 2.1** and **3.2**.

As reported in the last two audits, some other festive and decorative lights are not recorded in the database; and were therefore excluded from submission information.

- The 2019 audit found that decorative LED lights in the redwood trees on Maniapoto Street, Otorohanga were not recorded in the database. These lights are thought to have been donated to the community by The Lines Company, but they do not appear to be recorded in any database, therefore submission may not be occurring for them.
- During the 2020 field audit, five LED strings of festive lights were located on Jervois Street, Kawhia which were not recorded in the database. I confirmed they are still present in the field. I repeat the last audit's recommendation in **section 2.1**, to get these added to the database.

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
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: 12-Nov-20 To: 05-May-22	The database is not confirmed as accurate with a 95% level of confidence resulting in an estimated annual under submission of 10,400 kWh. NZTA lights being submitted by both ODC and NZTA resulting in 104,930 kWh of over submission. An estimated 22 NZTA lights or 19,540 kWh per annum reconciled to the Lines Company network instead of the Waipa network. Festive lights are included throughout the year resulting in an estimated annual over submission of 812 kWh. Some decorative and festive lights are not recorded in the database. Submission is based on a snapshot and does not consider historic adjustments. Potential impact: High Actual impact: High Audit history: Twice previously Controls: Weak Breach risk rating: 9
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as weak as the controls in place to manage the deriving of submission should have identified the duplication of load being submitted. The impact is assessed to be high based on the kWh impact to the market.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis has completed a review of the NZTA Waikato data base and are now currently in the process of comparing this to ODC. Once this comparison has been completed genesis will look to revise the submissions. Genesis will investigate the over submission of the festive lights and confirm with ODC the on and off times with the intent to reconceal this consumption going back 14mths Genesis has advised the ODC of the importance of tracking of change and will work with ODC to improve this process.	01/09/2022 Continuous improvement	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Genesis continues to work with the council to raise database accuracy levels.	Continuous improvement	

CONCLUSION

A monthly report is expected to be sent but none has been received since October 2021. I compared the May 2022 extract with the October 2021 extract and found no differences. I recommend Genesis follow this up with RATA to ensure that extracts are sent.

The NZTA lights reconciled in this database are also being reconciled by NZTA in their RAMM database. This is estimated to be resulting in 104,930 kWh of over submission to the market per annum. Genesis is the trader for both ODC and NZTA. I recommend that they work with the customers to determine which database these lights are to be reconciled to and process revisions accordingly.

The ODC NZTA lights are spread across the both the Lines Company and Waipa Networks but are only being reconciled to the Lines Company network. I identified 22 lights that are likely to be on the Waipa network. This will be resulting in an estimated 19,540 kWh per annum being reconciled and billed to the incorrect network.

Database accuracy is described as follows:

Result	Percentage	Comments
The point estimate of R	106.7	Wattage from survey is higher than the database wattage by 6.7%
R_L	101.6	With a 95% level of confidence, it can be concluded that the error could be between 1.6% and 11.7%
R_H	111.7	

The conclusion from Scenario C is that the variability of the sample results across the strata could mean that the true wattage (installed in the field) could be between 1.6% to 11.7% higher than the wattage recorded in the DUML database. Non-compliance is recorded because the potential error is greater than 5.0%.

- In absolute terms the installed capacity is estimated to be 2 kW higher than the database indicates.
- There is a 95% level of confidence that the installed capacity is between 1 and 4 kW higher than the database.
- In absolute terms, total annual consumption is estimated to be 10,400 kWh higher than the DUML database indicates.
- There is a 95% level of confidence that the annual consumption is between 2,500 to 18,000 kWh p.a. higher than the database indicates.

The audit found five non-compliances and makes four recommendations. The future risk rating of 31 indicates that the next audit be completed in three months. I have considered this in conjunction with Genesis' comments and recommend that the next audit be due six months from the last audit due date.

PARTICIPANT RESPONSE

Genesis has completed a review of the NZTA Waikato data base and are now currently in the process of comparing this to ODC. Once this comparison has been completed genesis will look to revise the submissions.

Genesis will investigate the over submission of the festive lights and confirm with ODC the on and off times with the intent to reconceal this consumption going back 14mths

Genesis has advised the ODC of the importance of tracking of change and will work with ODC to improve this process.