ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

SCANPOWER COMMUNITY LIGHTS AND MERIDIAN ENERGY LIMITED

Prepared by: Bernie Cross

Date audit commenced: 8 November 2022

Date audit report completed: 29 November 2022

Audit report due date: 1 December 2022

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EXECUTIVE SUMMARY

This audit of the **Scanpower community lights** DUML database and processes was conducted at the request of **Meridian Energy Limited (Meridian)** 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.

Scanpower maintains a database of under verandah lights installed in Woodville and Dannevirke, in the form of an Excel spreadsheet. Installation and maintenance work is completed by Scanpower, who update the database when lights are installed, repaired, or replaced.

All lights recorded in the database were surveyed in the field. I found that the field wattage was 99.5% of the database wattage, and compliance is recorded because the error is less than ±5.0%.

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.

Changes to the load are tracked in the database as they are changed, but the load is not calculated to reflect the change on the day the light was removed. Therefore, the current data used is a snapshot and this practice is non-compliant.

The audit found four non-compliances and makes no recommendations. Four new lights have been installed since the last audit and these are the first that have occurred for several years. The database has been updated during the audit by Scanpower to correct the wattage values for 76 lights plus update the records to the three recent light changes identified from the field audit. Meridian will process the incorrect wattage corrections outstanding from the previous audit via the available wash up periods.

The future risk rating of eight indicates that the next audit be completed in 18 months. I have considered this in conjunction Meridians comments and the recognising the database corrections that have been performed by Scanpower during this audit and I recommend that the next audit be in 24 months.

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	76 items have the incorrect wattage applied indicating an estimated over submission of 1,298 kWh per annum. The data used for submission does not track changes at a daily basis and is provided as a snapshot.	Moderate	Low	2	Identified
Audit trails	2.7	11(4) of Schedule 15.3	The Excel spreadsheet does not record an audit trail.	Moderate	Low	2	Identified
Database accuracy	3.1	15.2 and 15.37B(b)	76 items have the incorrect wattage applied indicating an estimated over submission of 1,298 kWh per annum. Three items of load have incorrect wattage recorded.	Moderate	Low	2	Identified
Volume information accuracy	3.2	15.2 and 15.37B(c)	76 items have the incorrect wattage applied indicating an estimated over submission of 1,298 kWh per annum. The data used for submission does not track changes at a daily basis and is provided as a snapshot.	Moderate	Low	2	Identified
Future Risk Rating						8	

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

RECOMMENDATIONS

Subject	Section	Recommendation
		Nil

ISSUES

Subject	Section	Description	Issue
		Nil	

1. ADMINISTRATIVE

1.1. Exemptions from Obligations to Comply with Code

Code reference

Section 11 of Electricity Industry Act 2010.

Code related audit information

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

Audit observation

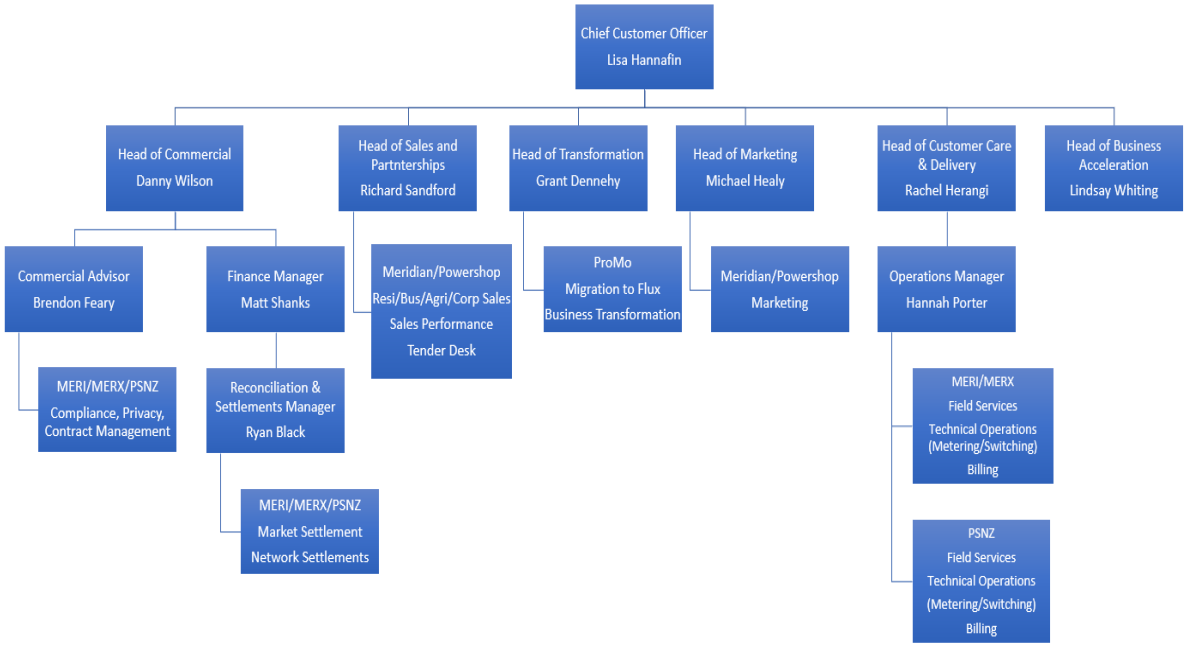
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

Audit commentary

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

1.2. Structure of Organisation

Meridian provided a copy of their organisational structure.



1.3. Persons involved in this audit

Auditor:

Name	Company	Role
Bernie Cross	Veritek Limited	Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Tristan Smiley	Network Engineer (Field Services)	Scanpower
Daniel Lau	Energy Data Analyst	Meridian Energy

1.4. Hardware and Software

Scanpower records DUML information for community and NZTA lights on their network in an Excel spreadsheet. The spreadsheet is saved on Scanpower's file network, which requires a login and password. All files on the network are backed up nightly.

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	NSP	Profile	Number of items of load	Database wattage (watts)
0009107000CA9BC	Community Lighting -	DVK0111	DST	225	16,518
0009108000CA0DC	Community Lighting - Woodville	WDV0111	DST	47	3,384
Total				272	19,902

1.7. Authorisation Received

All information was provided directly by Meridian or Scanpower.

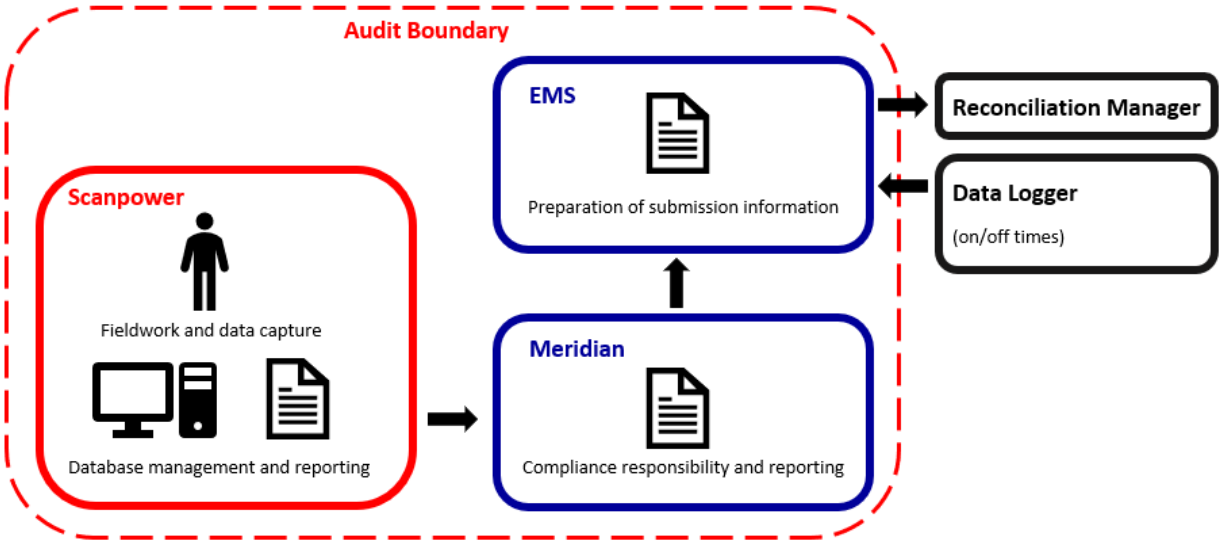
1.8. Scope of Audit

This audit of the Scanpower community lights DUML database and processes was conducted at the request of Meridian 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.

Scanpower maintains a database of under verandah lights installed in Woodville and Dannevirke, in the form of an Excel spreadsheet. Installation and maintenance work is completed by Scanpower, who update the database when lights are installed, repaired, or replaced.

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 all 272 items of load on 14 November 2022.

1.9. Summary of previous audit

The previous audit of this database was undertaken by Rebecca Elliot of Veritek Limited in May 2021. The summary table below shows the statuses of the non-compliances raised in the previous audit. Further comment is made in the relevant sections of this report.

Subject	Section	Clause	Non-compliance	Status
Deriving submissions	2.1	11(1) of Schedule 15.3	107 items have the incorrect wattage applied indicating an estimated over submission of 1,828 kWh per annum. The data used for submission does not track changes at a daily basis and is provided as a snapshot.	Still existing
Audit trails	2.7	11(4) of Schedule 15.3	The Excel spreadsheet does not record an audit trail.	Still existing
Database accuracy	3.1	15.2 and 15.37B(b)	107 items have the incorrect wattage applied indicating an estimated over submission of 1,828 kWh per annum. Two items of load have incorrect wattage recorded.	Still existing

Subject	Section	Clause	Non-compliance	Status
Volume information accuracy	3.2	15.2 and 15.37B(c)	107 items have the incorrect wattage applied indicating an estimated over submission of 1,828 kWh per annum. The data used for submission does not track changes at a daily basis and is provided as a snapshot.	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

Meridian have requested Veritek to undertake this streetlight audit.

Audit commentary

This audit report confirms that the requirement to conduct an audit has been met for this database within the required timeframe.

Audit outcome

Compliant

2. DUML DATABASE REQUIREMENTS

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

Code reference

Clause 11(1) of Schedule 15.3

Code related audit information

The retailer must ensure the:

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

Audit observation

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

Audit commentary

Meridian reconciles this DUML load using the DST profile. I compared the database provided to the capacity information Meridian supplied to EMS for the month of October 2022 and found it matched.

Meridian is using the Scanpower database for reconciliation. The on and off times are derived from a data logger read by EMS and are used to create a shape file. Meridian supplies EMS with the capacity information and EMS calculates the kWh figure for each ICP and includes this in the relevant AV080 file. This process was audited during Meridian's reconciliation participant audit and EMS' agent audit. Compliance was confirmed for both parties.

The field audit confirmed that the database is accurate within the allowable +/-5% threshold.

Analysis of the database found 76 items of load with the lamp wattage of 72W recorded incorrectly as 76W for the Dannevirke population of lights. This will be resulting in an estimated over submission of 1,298 kWh per annum. This is detailed in **section 3.1**.

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

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

Changes to the load are tracked in the database as they are changed, but the load is not calculated to reflect the change on the day the light was removed. Therefore, the current data used is a snapshot and this practice is non-compliant.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 01-May-21 To: 14-Nov-22	76 items have the incorrect wattage applied indicating an estimated over submission of 1,298 kWh per annum. The data used for submission does not track changes at a daily basis and is provided as a snapshot. Potential impact: Low Actual impact: Low Audit history: Twice previously Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	Controls are rated as moderate as the processes overall are robust, but the change of the load, whilst tracked at a daily level, is calculated as a snapshot. The audit risk rating is low as the impact on submission is very minor.

Actions taken to resolve the issue	Completion date	Remedial action status
Scanpower has corrected all wattage inaccuracies in the database and Meridian will revise historic submissions to correct the over submission	01/02/2023	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
We have assessed our processes and tools to account for historic lamp installations and changes to the database at a daily level. There are checks in place comparing month to month data to identify any material changes and confirm details for these. These are accounted for in monthly submission.	Ongoing	

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

Code reference

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

Code related audit information

The DUML database must contain:

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

Audit observation

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

Audit commentary

The ICP number is recorded for all items of load.

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

Street number, road name, and business name are recorded for all items of load.

Audit outcome

Compliant

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

Code reference

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

Code related audit information

The DUML database must contain:

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

Audit observation

The database was checked to confirm that:

- it contained a field for 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

A description and total wattage for each light is recorded. The accuracy of the recorded wattages is discussed in **section 3.1**.

Audit outcome

Compliant

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

Code reference

Clause 11(2A) of Schedule 15.3

Code related audit information

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

Audit observation

The field audit was undertaken of all 272 lights.

Audit commentary

The field audit discrepancies are detailed in the table below:

Street	Database count	Field count	Light count difference	Wattage recorded incorrectly	Comments
Dannevirke					
24 High Street (Holiday Inn)	3	3		1	1 incorrect wattage recorded in the database as 96W Fluorescent, but 60W LED found in the field
53 High Street (Subway)	**2**	**2**		**1**	1 incorrect wattage recorded in the database as 96W Fluorescent, but 60W LED found in the field
Woodville					
88 Vogel St (Café 88)	**2**	**2**		**1**	1 incorrect wattage recorded in the database as 92W Fluorescent, but 60W LED found in the field
Grand Total	**7**	**7**		**3**	

Two of the discrepancies identified were lights that had been upgraded just prior to the field audit so were relating to timing issues in the provision of the database extract. The third exception was identified as missing paperwork from a lighting upgrade. All three exceptions have now been updated within the database.

The audit did not find any additional lights in the field. The accuracy of the database 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 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 Excel spreadsheet records light install, removal and change dates.

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 is an Excel spreadsheet, and does not have an automatically generated audit trail that meets the requirements of Clause 11(4) of Schedule 15.3.

All changes are recorded in the database, and the removed lights remain in the database with the removed date recorded. The provides a history of the lights installed and removed.

The user who made changes is not recorded, but the database is normally only changed by Scanpower's Network Engineer (Field Services).

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.7 With: Clause 11(4) of Schedule 15.3 From: 01-May-21 To: 14-Nov-22	The Excel spreadsheet does not record an audit trail. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are moderate as they will mitigate risk most of the time but there is room for improvement. The audit risk rating is low because historic information is retained enabling before and after values to be confirmed, and the approximate date of the change. The database is normally maintained by one user.

Actions taken to resolve the issue	Completion date	Remedial action status
		Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Existing audit trail capability is considered adequate given the size of the database, frequency of changes and number of operators with access to maintain the database		

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

Meridian's submissions are based on a monthly extract from the database. A database extract was provided in October 2022. A full field audit was undertaken.

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

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

Audit commentary

Field audit findings

A field audit was conducted of all 272 items of load recorded in the database. I found that the field wattage was 99.5% of the database wattage, and compliance is recorded because the error is less than ±5.0%. The variances in the field are detailed in **section 2.5**.

Light description and capacity accuracy

As discussed in **section 2.4**, all lights have a lamp and gear wattage recorded. Lamp and gear wattages were compared to the expected values and the following exceptions were identified:

Model	Database Wattage	Correct Wattage	Quantity	Total difference (W)
Unknown 2 x 36W Fluorescent	76	72	76	304
		Total	**74**	**304**

The correct ballast is being applied to these lights therefore the incorrect base wattage will be resulting in an estimated over submission of 1,298 kWh. This has now been corrected within the database by Scanpower during the audit and was confirmed on receipt of a revised database extract.

Change management process findings

Scanpower maintains a database of under verandah lights installed in Woodville and Dannevirke, in the form of an Excel spreadsheet. Installation and maintenance work is completed by Scanpower, who update the database when lights are installed, repaired, or replaced.

The Excel spreadsheet records light install, removal and change dates, and the monthly report is provided as a snapshot at the end of each month.

I walked through the new connection process and confirmed that four new lights have been installed since the last audit and these are the first that have occurred for several years.

Inspections of under verandah lights are completed every six months by Scanpower, to identify any lights that require repairs or maintenance.

Festive lights

No festive lights are connected to the under-veranda lighting circuits. Tararua Disctict Council are responsible for festive light load relating to Dannevirke and Woodville and instruct Scanpower to install and remove these lights each year.

Private lights

Private under verandah lights are metered through the affected shops' installations.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 01-May-21 To: 14-Nov-22	76 items have the incorrect wattage applied indicating an estimated over submission of 1,298 kWh per annum. This has now been corrected within the database. Three items of load have incorrect wattage recorded. Potential impact: None Actual impact: Low Audit history: Once Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are moderate as they will mitigate risk most of the time but there is room for improvement. The audit risk rating is low as the impact on submission is very minor.

Actions taken to resolve the issue	Completion date	Remedial action status
Scanpower has corrected all wattage inaccuracies in the database and Meridian will revise historic submissions to correct the over submission.	01/02/2023	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	

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

Meridian reconciles this DUML load using the DST profile. I compared the database provided to the capacity information Meridian supplied to EMS for the month of October 2022 and found it matched.

Meridian is using the Scanpower database for reconciliation, wattages are derived from reports provided by Scanpower. The on and off times are derived from a data logger read by EMS and are used to create a shape file.

Meridian supplies EMS with the capacity information rounded to two decimal places and EMS calculates the kWh figure for each ICP and includes this in the relevant AV080 file. This process was audited during Meridian's reconciliation participant audit and EMS' agent audit. Compliance was confirmed for both parties.

The field audit confirmed that the database is up to date.

Analysis of the database found 76 items of load with the lamp wattage of 72W recorded incorrectly as 76W. This will be resulting in an estimated over submission of 1,298 kWh per annum. This is detailed in **section 3.1**.

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

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

Changes to the load are tracked in the database as they are changed, but the load is not calculated to reflect the change on the day the light was removed. Therefore, the current data used is a snapshot and this practice is non-compliant.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: 01-May-21 To: 14-Nov-22	76 items have the incorrect wattage applied indicating an estimated over submission of 1,298 kWh per annum. This has now been corrected within the database. The data used for submission does not track changes at a daily basis and is provided as a snapshot. Potential impact: Low Actual impact: Low Audit history: Twice Controls: Moderate Breach risk rating: 2

Audit risk rating	Rationale for audit risk rating		
Low	Controls are rated as moderate as the processes overall are robust, but the change is not tracked at a daily level. The impact is assessed to be low as there are very few changes made to this database and the field audit confirmed the database to be accurate based on the estimated database errors found.		
Actions taken to resolve the issue		**Completion date**	**Remedial action status**
Scanpower has corrected all wattage inaccuracies in the database and Meridian will revise historic submissions to correct the over submission.		01/02/2023	Identified
Preventative actions taken to ensure no further issues will occur		**Completion date**	
We have assessed our processes and tools to account for historic lamp installations and changes to the database at a daily level. There are checks in place comparing month to month data to identify any material changes and confirm details for these. These are accounted for in monthly submission.		Ongoing	

CONCLUSION

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.

Scanpower maintains a database of under verandah lights installed in Woodville and Dannevirke, in the form of an Excel spreadsheet. Installation and maintenance work is completed by Scanpower, who update the database when lights are installed, repaired, or replaced.

All lights recorded in the database were surveyed in the field. I found that the field wattage was 99.5% of the database wattage, and compliance is recorded because the error is less than ±5.0%.

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.

Changes to the load are tracked in the database as they are changed, but the load is not calculated to reflect the change on the day the light was removed. Therefore, the current data used is a snapshot and this practice is non-compliant.

The audit found four non-compliances and makes no recommendations. Four new lights have been installed since the last audit and these are the first that have occurred for several years. The database has been updated during the audit by Scanpower to correct the wattage values for 76 lights plus update the records to the three recent light changes identified from the field audit. Meridian will process the incorrect wattage corrections outstanding from the previous audit via the available wash up periods.

The future risk rating of eight indicates that the next audit be completed in 18 months. I have considered this in conjunction Meridians comments and the recognising the database corrections that have been performed by Scanpower during this audit and I recommend that the next audit be in 24 months.

PARTICIPANT RESPONSE