

ELECTRICITY INDUSTRY PARTICIPATION CODE  
DISTRIBUTED UNMETERED LOAD AUDIT REPORT



For

GORE DISTRICT COUNCIL  
AND  
MERIDIAN ENERGY  
NZBN: 9429037696863

Prepared by: Rebecca Elliot

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Audit report due date: 08-Mar-24

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## EXECUTIVE SUMMARY

This audit of the **Gore District Council (GDC)** DUMML 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 DUMML audits version 1.1.

The database is remotely hosted by thinkproject Ltd. WSP provide a monthly report to Meridian of this database. Meridian reconciles this DUMML load using the DST profile.

The field audit was undertaken of a statistical sample of 184 items of load on 9<sup>th</sup> January 2024.

The database accuracy appears to have worsened since the last audit. This is not an indication of further decline in database accuracy and will be due to the sample containing a number of 130W lamps recorded as 24W. It is not within the allowable +/-5% accuracy threshold and under submission is likely to be occurring as a result:

- in absolute terms the installed capacity is estimated to be 29 kW higher than the database indicates,
- there is a 95% level of confidence that the installed capacity is between 1 kW and 79 kW higher than the database,
- in absolute terms, total annual consumption is estimated to be 122,600 kWh higher than the DUMML database indicates, and
- there is a 95% level of confidence that the annual consumption is between 5,500 kWh and 336,600 kWh p.a. higher than the database indicates.

As reported in the last audit the monthly wattage report provided, the monthly wattage report uses the lamp note field to derive wattages rather than the combined value of lamp and gear wattage, therefore the database extract provided does not align with the wattage report provided to Meridian. I repeat the last audit's recommendation that the combined value of lamp and gear wattage is used in the wattage report. This will require some data cleansing.

GDC advised that they have a full contingent of staff now and are confident that they will be able to address the non-compliances raised in this audit.

This audit found six non-compliances and makes six recommendations. The future risk rating of 38 indicates that the next audit be completed in three months. I have considered this in conjunction with Meridian's comments and Meridian's efforts to engage the customer to make improvement and recommend that the next audit be in six months time.

The matters raised are detailed below:

## AUDIT SUMMARY

### NON-COMPLIANCES

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Deriving submission information	2.1	Clause 11(1) of Schedule 15.3	In absolute terms, total annual consumption is estimated to be 122,600 kWh higher than the DUML database indicates.  The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.	Weak	High	9	Investigating
Location of each item of load	2.3	11(2)(b) of Schedule 15.3	Nine items of load with insufficient details to locate.	Weak	Low	3	Investigating
Description and capacity of load	2.4	Clause 11(2)(c) and (d) of Schedule 15.3	49 items of load with no lamp wattages and/or lamp description that would result in an estimated under submission of 14,684 kWh per annum if used to derive the wattage.	Weak	Low	2	Investigating
All load recorded in database	2.5	11(2A) of Schedule 15.3	Four additional items of load found in the field of 184 items of load sampled	Weak	Low	3	Investigating

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Database accuracy	3.1	Clause 15.2 and 15.37B(b)	<p>In absolute terms, total annual consumption is estimated to be 122,600 kWh higher than the DUML database indicates.</p> <p>49 items of load with lamp wattages and/or lamp description resulting in an estimated under submission of 14,684 kWh per annum.</p> <p>146 fluorescent items of load with the incorrect gear wattage applied resulting in an estimated annual under submission of 5,609 kWh if used to derive the wattage.</p> <p>Changes made in the field not being updated in the RAMM database.</p>	Weak	High	9	Investigating
Volume information accuracy	3.2	Clause 15.2 and 15.37B(c)	<p>In absolute terms, total annual consumption is estimated to be 122,600 kWh higher than the DUML database indicates.</p> <p>The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.</p>	Weak	High	9	Investigating
Future Risk Rating						36	

<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	Recommendation
Deriving submission	2.1	Use the combined value of lamp and gear wattage to derive the total wattage.
Database accuracy	3.1	Complete a field audit of all the under-verandah lights to confirm light make and model and therefore wattage.
		Update RAMM with the make and model details for 54 items of load so that the wattage can be confirmed as accurately recorded in RAMM.
		Review the new streetlight connection process to ensure that lights are reconciled from the electrical connection date.
		Review change management process so that changes made in the field are updated in the RAMM database.
		Liaise with Powernet and GDC to move the privately owned lights from the GDC database to their own ICP

## 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

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 commentary

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

### 1.2. Persons involved in this audit

Auditor:

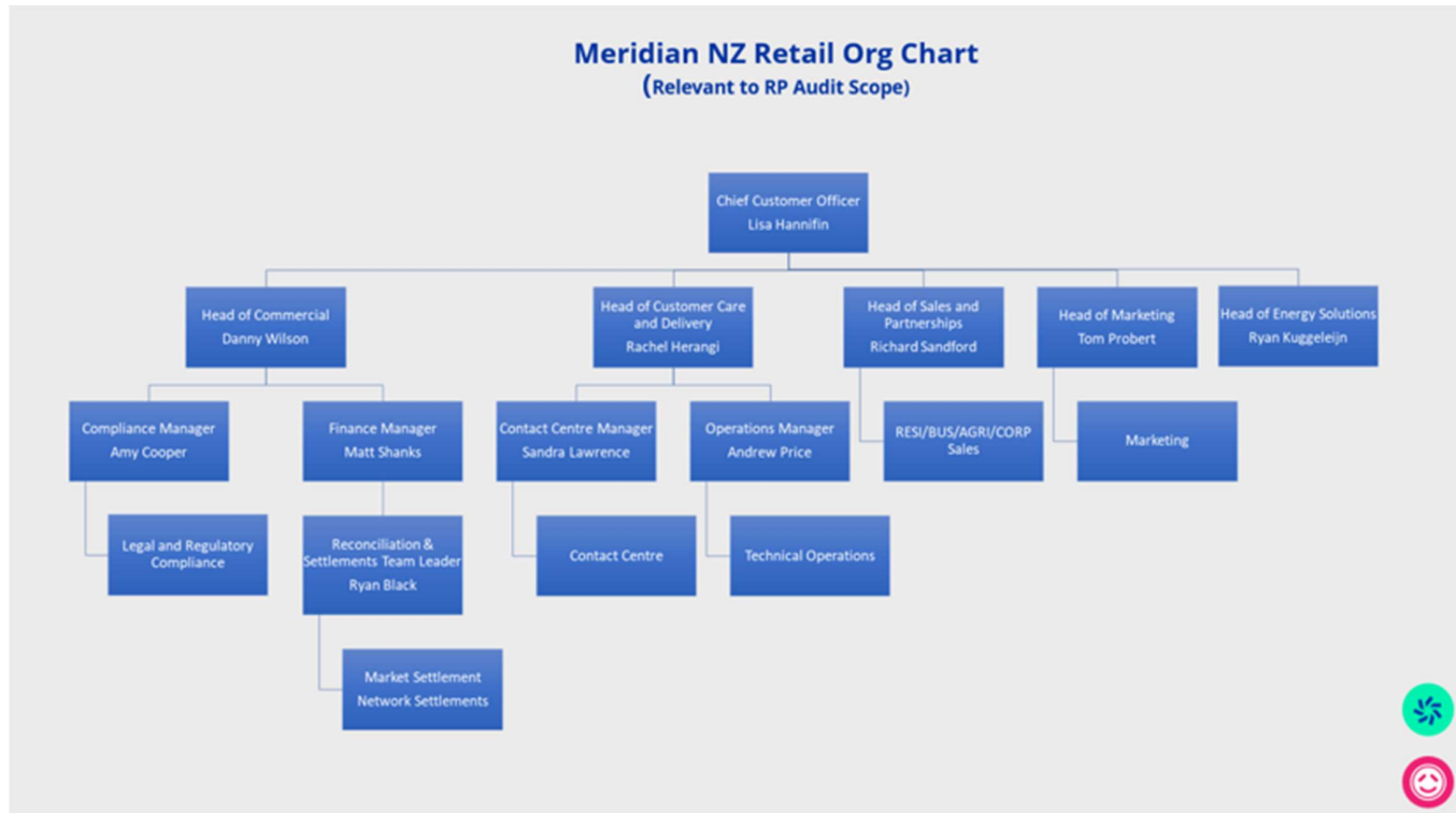
Name	Title	Company
Rebecca Elliot	Auditor	Veritek

Other personnel assisting in this audit were:

Name	Title	Company
Melanie Mathews	Quality and Compliance Advisor	Meridian Energy
Murray Hasler	Roading Asset Manager	Gore District Council
Rehan Mehta	Engineer and Asset Management	WSP NZ

### 1.3. Structure of Organisation

Meridian provided a copy of their organisational structure:





#### 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	NSP	Number of items of load	Database wattage (watts)
0008801002TP3AD	GDC LIGHTS - URBAN	GOR0331	174	4,176
0008801019TP7D4	GDC LIGHTS - NZTA	GOR0331	336	66,015
0008801020TPE7D	GDC LIGHTS - URBAN	GOR0331	44	1,028
0008801007TPEE2	GDC LIGHTS - URBAN	GOR0331	1,144	37,857
<b>Total</b>			<b>1,698</b>	<b>109,076</b>

#### 1.7. Authorisation Received

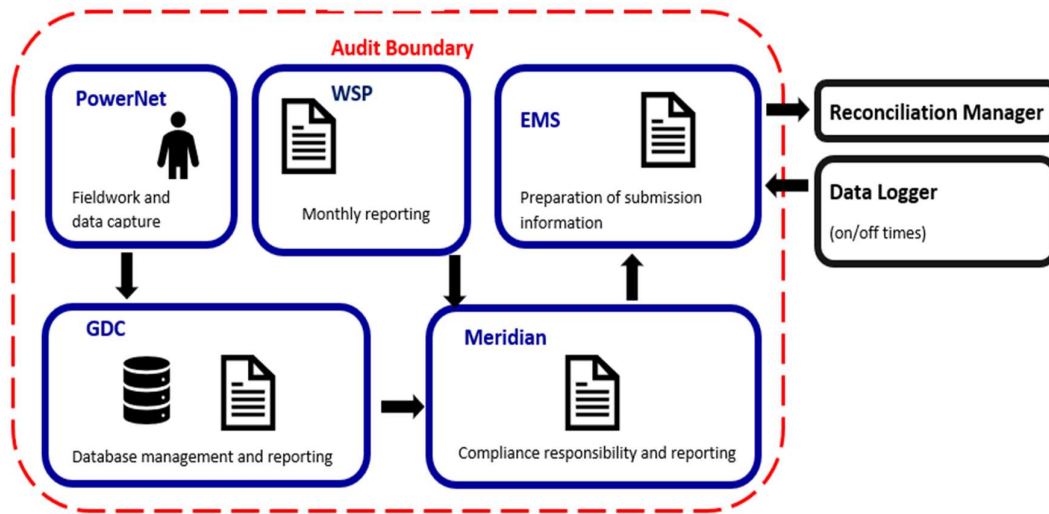
All information was provided directly by Meridian, WSP and GDC.

#### 1.8. Scope of Audit

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.

Field work is conducted by PowerNet as a contractor.

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 184 items of load on 9<sup>th</sup> January 2024.

### 1.9. Summary of previous audit

The previous audit was completed in July 2023 by Rebecca Elliot of Veritek Limited. Five non-compliances were identified, and one recommendation was made. The current statuses of the non-compliance clauses recorded, and the recommendation are detailed below:

#### Table of Non-Compliance

Subject	Section	Clause	Non-Compliance	Status
Deriving submission information	2.1	Clause 11(1) of Schedule 15.3	In absolute terms, the total annual consumption is estimated to be 45,200 kWh higher than the DUML database indicates.  139 items of load with no lamp wattages and/or no lamp description resulting in an estimated under submission of 50,090 kWh per annum.  204 fluorescent items of load with no ballast applied resulting in a potential estimated under submission of 35,730 kWh per annum.  The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.	Still existing
Description and capacity of load	2.4	Clause 11(2)(c) and (d) of Schedule 15.3	139 items of load with no lamp wattages and/or lamp description resulting in an estimated under submission of 50,090 kWh per annum.	Still existing
All load recorded in database	2.5	11(2A) of Schedule 15.3	One additional item of load was found in the field of 300 items of load sampled.	Still existing

Subject	Section	Clause	Non-Compliance	Status
Database accuracy	3.1	Clause 15.2 and 15.37B(b)	<p>In absolute terms, total annual consumption is estimated to be 45,200 kWh higher than the DUML database indicates.</p> <p>204 fluorescent items of load with no ballast applied resulting in a potential estimated under submission of 35,730 kWh per annum.</p> <p>139 items of load with lamp wattages and/or lamp description resulting in an estimated under submission of 50,091kWh per annum.</p> <p>Changes made in the field not being updated in the RAMM database.</p>	Still existing
Volume information accuracy	3.2	Clause 15.2 and 15.37B(c)	<p>In absolute terms, the total annual consumption is estimated to be 45,200 kWh higher than the DUML database indicates.</p> <p>139 items of load with no lamp wattages and/or no lamp description resulting in an estimated under submission of 50,090 kWh per annum.</p> <p>204 fluorescent items of load with no ballast applied resulting in a potential estimated under submission of 35,730 kWh per annum.</p> <p>The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.</p>	Still existing

### Table of Recommendations

Subject	Section	Recommendation	Status
Deriving submission	2.1	Use the combined value of lamp and gear wattage to derive the total wattage.	Repeated
Database accuracy	3.1	Use the combined value of lamp and gear wattage to derive the total wattage.	Repeated
		Complete a field audit of all the under-verandah lights to confirm light make and model and therefore wattage.	Repeated
		Update RAMM with the make and model details for the Fairy lights so that the wattage can be confirmed as accurately recorded in RAMM.	Cleared
		Review the new streetlight connection process to ensure that lights are reconciled from the electrical connection date.	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

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.

### 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.

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 the EMS agent audit. Compliance was confirmed for both parties.

I compared the database provided to the capacity information Meridian supplied to EMS for the month of December 2023 and I confirm the submission is calculated correctly from the GDC provided wattage report.

As reported in the last audit the monthly wattage report provided, the monthly wattage report uses the lamp note field to derive wattages rather than the combined value of lamp and gear wattage, therefore the database extract provided does not align with the wattage report provided to Meridian. I repeat the last audit's recommendation that the combined value of lamp and gear wattage is used in the wattage report. This will require some data cleansing.

Description	Recommendation	Audited party comment	Remedial action
Deriving submission	Use the combined value of lamp and gear wattage to derive the total wattage.	Meridian has advised Gore DC of the recommendations.  Meridian will follow up Gore DC regularly to see if any of the recommendations are implemented and offer assistance.	Investigating

The field audit found that the database was not within the allowable +/-5% accuracy threshold. In absolute terms, total annual consumption is estimated to be 122,600 kWh higher than the DUML database indicates. This is not an indication of a decline in the database accuracy from the last audit but is due to the sample selected containing a number of lights recorded as 24W but were 130W LEDs. This is recorded as non-compliance below.

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

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

The current data provided is a snapshot. Meridian is working with GDC and WSP to provide a monthly wattage report that considers changes at a daily level. The use of a snapshot is recorded as non-compliance.

### Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3  From: 23-May-23 To: 16-Jan-24	In absolute terms, total annual consumption is estimated to be 122,600 kWh higher than the DUML database indicates.  The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.  Potential impact: High Actual impact: High Audit history: Multiple times Controls: Weak Breach risk rating: 9		
Audit risk rating	Rationale for audit risk rating		
<b>High</b>	The controls are rated as weak as the processes in place do not mitigate risk to an acceptable level.  The impact is assessed to be high based on the kWh impact on reconciliation.		
Actions taken to resolve the issue		Completion date	Remedial action status
Meridian has advised Gore DC of the inaccuracies identified and has requested for corrections to be made.		01/02/2024	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	
Meridian will continue to follow up with Gore DC regularly to have the inaccuracies corrected.  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.		08/09/2024  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

An ICP 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

The database contains fields for the street name, Pole number, and Global Positioning System (GPS) coordinates. GPS coordinates and street name are recorded for all but nine new items of load added on 3/03/23. GDC is working with WSP to get these co-ordinates added. This is recorded as non-compliance.

### Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.3 With: Clause 11(2)(b) of Schedule 15.3 From: 03-Mar-23 To: 16-Jan-24	Nine items of load with insufficient details to locate. Potential impact: Low Actual impact: Low Audit history: None Controls: Weak Breach risk rating: 3		
Audit risk rating	Rationale for audit risk rating		
Low	The controls are rated as weak as the processes in place do not mitigate risk to an acceptable level. The audit risk rating is assessed to be low as this affected only nine items of load.		
Actions taken to resolve the issue		Completion date	Remedial action status
Meridian has advised Gore DC of the inaccuracies identified and has requested for corrections to be made.		01/02/2024	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	
Meridian will continue to follow up with Gore DC regularly to have the inaccuracies corrected.		08/09/2024	

#### 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 that 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

The database contains the lamp model which records the lamp wattage. The lamp notes field is used to record the total wattage for the lamp including wattage and ballast and this is used to calculate the kW value for submission. As detailed in **section 2.1**, I recommend that this process is reviewed as the data held in the lamp notes field is not accurate. Analysis of the database found:

- 49 items of load with no lamp type or wattage recorded. I have calculated the missing load based on the most common for that light type.

This needs to be corrected before this is used in the monthly wattage report. If not, this would result in an estimated under submission of 14,684 kWh per annum. This is recorded as non-compliance below and in **section 3.1**.

The accuracy of the recorded wattages and lamp descriptions is discussed in **section 3.1**.

### Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.4 With: Clause 11(2)(c) &(d) of Schedule 15.3 From: 11-Jan-23 To: 16-Jan-24	49 items of load with no lamp wattages and/or lamp description that would result in an estimated under submission of 14,684 kWh per annum if used to derive the wattage. Potential impact: Medium Actual impact: None Audit history: Twice previously Controls: Weak Breach risk rating: 3		
Audit risk rating	Rationale for audit risk rating		
<b>Low</b>	The controls are rated as weak as the kW value process will not mitigate risk to an acceptable level. The impact is assessed to be low as these values are not used to calculate submission.		
Actions taken to resolve the issue		Completion date	Remedial action status
Meridian has advised Gore DC of the inaccuracies identified and has requested for corrections to be made.		01/02/2024	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	
Meridian will continue to follow up with Gore DC regularly to have the inaccuracies corrected.		08/09/2024	

## 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 184 items of load on 22<sup>nd</sup> June 2023.

### Audit commentary

The field audit discrepancies are detailed in the table below:

Discrepancy	Quantity
Lights in the database not in the field	0
Lights in the field, not in the database	4
Incorrect wattage	9

A detailed spreadsheet has been provided to GDC.

The field audit found four additional items of load found in the field of 184 items of load sampled.

The accuracy of the database is detailed in **section 3.1**.

### Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3 From: 23-May-23 To: 16-Jan-24	Four additional items of load found in the field of 184 items of load sampled. Potential impact: Low Actual impact: Low Audit history: Three times previously Controls: Weak Breach risk rating: 3		
Audit risk rating	Rationale for audit risk rating		
<b>Low</b>	The controls are rated as weak as the processes in place do not mitigate risk to an acceptable level. The impact is assessed to be low due to four additional lights found in the field in relation to the overall count of the items of load.		
Actions taken to resolve the issue		Completion date	Remedial action status
Meridian has advised Gore DC of the inaccuracies identified and has requested for corrections to be made.		01/02/2024	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	
Meridian will continue to follow up with Gore DC regularly to have the inaccuracies corrected.		08/09/2024	

## 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.

### 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 RAMM database was checked for audit trails.

### Audit commentary

RAMM records audit trail information of changes made.

### 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	Gore District Council region
Strata	The database contains items of load in Gore district area including Waka Kotahi lights.  The processes for the management of GDC items of load are the same, but I decided to place the items of load into four strata of a similar size, as follows: <ol style="list-style-type: none"> <li>1. A -Hok,</li> <li>2. Hop- Main St- DECR</li> <li>3. Main St-INCR- O, and</li> <li>4. P – W.</li> </ol>
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 40 sub-units.
Total items of load	184 items of load were checked.

Wattages were checked for alignment with the published standardised wattage table produced by the Electricity Authority or against the LED light specification provided.

The accuracy of the ICP assignment was examined.

The process to manage changes made in the field being updated in the database was examined.

##### Audit commentary

##### Field Audit Findings

A field audit was conducted of a statistical sample of 184 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	126.3	Wattage from survey is higher than the database wattage by 26.3%
R <sub>L</sub>	101.2	With a 95% level of confidence, it can be concluded that the error could be between 1.2% and 68.8%.
R <sub>H</sub>	172.2	

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 B (detailed below) applies.

The conclusion from Scenario B is that the variability of the sample results across the strata means that the true wattage (installed in the field) could be between 0.8% and 68.8% 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 29 kW higher than the database indicates.

There is a 95% level of confidence that the installed capacity is between 1 kW and 79 kW higher than the database.

In absolute terms, total annual consumption is estimated to be 122,600 kWh higher than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 5,500 kWh and 336,300 kWh p.a. higher than the database indicates. This is not an indication of further decline in database accuracy and will be due to the sample containing a number of 130W lamps recorded as 24W.

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

As detailed in **section 2.1**, Meridian is supplied the “lamp notes” field to calculate the total kW value. This field was not provided in the database extract for this audit. I recommend that the lamp wattage and gear wattage are used to derive the kW values.

These details have been provided to GDC and WSP and will need to be corrected before the lamp and gear wattage figures are used.

As noted in the last audit, the light description maybe incorrect for the under-verandah lighting making the wattage incorrect. I repeat the last audit's that a field audit of these is completed to confirm light make and model and therefore wattage.

Recommendation	Description	Audited party comment	Remedial action
Database accuracy	Complete a field audit of all the under-verandah lights to confirm light make and model and therefore wattage.	Meridian has advised Gore DC of the recommendations.  Meridian will follow up Gore DC regularly to see if any of the recommendations are implemented and offer assistance.	Investigating

Analysis of the database found:

- As noted in **section 2.4**, 49 items of load with no lamp type or wattage recorded. I have calculated the missing load based on the most common total wattage for that light type. This would result in an estimated under submission of 14,684 kWh per annum if these values were used. This is recorded as non-compliance below.
- 146 fluorescent lights with the incorrect gear wattage applied. This would result in an estimated under submission of 5,609 kWh per annum if these values were used. This is recorded as non-compliance below.
- 54 items of load have insufficient light make and model details to determine the wattage (47 LED lights and seven lights with an unknown type). I recommend that the light make and model details are added.

These details have been provided to GDC and WSP and will need to be corrected before the lamp and gear wattage figures are used.

Recommendation	Description	Audited party comment	Remedial action
Database accuracy	Update RAMM with the make and model details for 54 items of load so that the wattage can be confirmed as accurately recorded in RAMM.	Meridian has advised Gore DC of the recommendations.  Meridian will follow up Gore DC regularly to see if any of the recommendations are implemented and offer assistance.	Investigating

### Waka Kotahi lighting

Waka Kotahi lighting is included in the database. This is expected to be moved to a dedicated Waka Kotahi database within the next 12 months. This is included as part of this audit until this change is completed.

### Change management process findings

The processes were reviewed for new lamp connections and the tracking of load changes due to faults and maintenance.

As reported in the last audit, GDC does not have much new development but has had two new developments during the audit period. The electrical connection date has not been advised by Powernet, so the active date has been derived from the pole install date. I repeat the last audit's recommendation that Meridian review the new streetlight connection process in conjunction with GDC and Powernet to ensure that the volumes are reconciled from the correct date for new streetlights.

Recommendation	Description	Audited party comment	Remedial action
Database accuracy	Review the new streetlight connection process to ensure that lights are reconciled from the electrical connection date.	Meridian has advised Gore DC of the recommendations.  Meridian will follow up Gore DC regularly to see if any of the recommendations are implemented and offer assistance.	Investigating

Powernet carry out all maintenance work but there has been no formal contract in place for some time. GDC intend to address this. As recorded in the last audit, the notification process from Powernet to GDC and WSP is unclear and I recommend that this is reviewed to ensure changes made in the field are updated in the database.

Recommendation	Description	Audited party comment	Remedial action
Database accuracy	Review change management process so that changes made in the field are updated in the RAMM database.	Meridian has advised Gore DC of the recommendations.  Meridian will follow up Gore DC regularly to see if any of the recommendations are implemented and offer assistance.	Investigating

GDC have identified some lights that are now in private ownership that need to be removed from the GDC load. I recommend that Meridian work with GDC and Powernet to action this and once they are being reconciled elsewhere the items of load can be removed.

Recommendation	Description	Audited party comment	Remedial action
Private lights	Liaise with Powernet and GDC to move the privately owned lights from the GDC database to their own ICP.	Meridian has advised Gore DC of the recommendations.  Meridian will follow up Gore DC regularly to see if any of the recommendations are implemented.	Investigating

#### **Central Management System and/or dimming**

The LED light rollout was completed some years ago. There is no CMS system in place and no dimming is planned at this stage.

#### **Audit outcome**

Non-compliant



Non-compliance	Description	
<p>Audit Ref: 3.1</p> <p>With: Clause 15.2 and 15.37B(b)</p> <p>From: 12-Jan-23</p> <p>To: 22-May-23</p>	<p>In absolute terms, total annual consumption is estimated to be 122,600 kWh higher than the DUMML database indicates.</p> <p>49 items of load with lamp wattages and/or lamp description resulting in an estimated under submission of 14,684 kWh per annum.</p> <p>146 fluorescent items of load with the incorrect gear wattage applied resulting in an estimated annual under submission of 5,609 kWh if used to derive the wattage.</p> <p>Changes made in the field not being updated in the RAMM database.</p> <p>Potential impact: High</p> <p>Actual impact: High</p> <p>Audit history: Multiple times previously</p> <p>Controls: Weak</p> <p>Breach risk rating: 9</p>	
Audit risk rating	Rationale for audit risk rating	
High	<p>The controls are rated as weak as the kW value process will not mitigate risk to an acceptable level.</p> <p>The impact is assessed to be high based on the estimated under submission.</p>	
Actions taken to resolve the issue	Completion date	Remedial action status
Meridian has advised Gore DC of the inaccuracies identified and has requested for corrections to be made.	01/02/2024	Investigating
Preventative actions taken to ensure no further issues will occur	Completion date	
Meridian will continue to follow up with Gore DC regularly to have the inaccuracies corrected.	08/09/2024	

### 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 DUMML is being calculated accurately,
- profiles for DUMML 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, against the submitted figure to confirm accuracy.

### Audit commentary

Meridian reconciles this DUML load using the DST profile.

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 the EMS agent audit. Compliance was confirmed for both parties.

I compared the database provided to the capacity information Meridian supplied to EMS for the month of December 2023 and I confirm the submission is calculated correctly from the GDC provided wattage report.

As reported in the last audit the monthly wattage report provided, the monthly wattage report uses the lamp note field to derive wattages rather than the combined value of lamp and gear wattage, therefore the database extract provided does not align with the wattage report provided to Meridian. I recommend in **section 2.1**, that the combined value of lamp and gear wattage is used in the wattage report. This will require some data cleansing.

The field audit found that the database was not within the allowable +/-5% accuracy threshold. In absolute terms, total annual consumption is estimated to be 122,600 kWh higher than the DUML database indicates. This is not an indication of a decline in the database accuracy from the last audit but is due to the sample selected containing a number of lights recorded as 24W but were 130W LEDs. This is recorded as non-compliance below.

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

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

The current data provided is a snapshot. Meridian is working with GDC and WSP to provide a monthly wattage report that considers changes at a daily level. The use of a snapshot is recorded as non-compliance.

### Audit outcome

Non-compliant

Non-compliance	Description		
<p>Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c)</p> <p>From: 23-May-23 To: 16-Jan-24</p>	<p>In absolute terms, total annual consumption is estimated to be 122,600 kWh higher than the DUMML database indicates.</p> <p>The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.</p> <p>Potential impact: High Actual impact: High Audit history: Multiple times Controls: Weak Breach risk rating: 9</p>		
Audit risk rating	Rationale for audit risk rating		
<p><b>High</b></p>	<p>The controls are rated as weak as the processes in place do not mitigate risk to an acceptable level.</p> <p>The impact is assessed to be high, based on the kWh differences described above.</p>		
Actions taken to resolve the issue		Completion date	Remedial action status
<p>Meridian has advised Gore DC of the inaccuracies identified and has requested for corrections to be made.</p>		<p>01/02/2024</p>	<p>Investigating</p>
Preventative actions taken to ensure no further issues will occur		Completion date	
<p>Meridian will continue to follow up with Gore DC regularly to have the inaccuracies corrected.</p> <p>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.</p>		<p>08/09/2024</p> <p>Ongoing</p>	

## CONCLUSION

The database is remotely hosted by thinkproject Ltd. WSP provide a monthly report to Meridian of this database. Meridian reconciles this DUMML load using the DST profile.

The field audit was undertaken of a statistical sample of 184 items of load on 9<sup>th</sup> January 2024.

The database accuracy appears to have worsened since the last audit. This is not an indication of further decline in database accuracy and will be due to the sample containing a number of 130W lamps recorded as 24W. It is not within the allowable +/-5% accuracy threshold and under submission is likely to be occurring as a result:

- in absolute terms the installed capacity is estimated to be 29 kW higher than the database indicates,
- there is a 95% level of confidence that the installed capacity is between 1 kW and 79 kW higher than the database,
- in absolute terms, total annual consumption is estimated to be 122,600 kWh higher than the DUMML database indicates, and
- there is a 95% level of confidence that the annual consumption is between 5,500 kWh and 336,600 kWh p.a. higher than the database indicates.

As reported in the last audit the monthly wattage report provided, the monthly wattage report uses the lamp note field to derive wattages rather than the combined value of lamp and gear wattage, therefore the database extract provided does not align with the wattage report provided to Meridian. I repeat the last audit's recommendation that the combined value of lamp and gear wattage is used in the wattage report. This will require some data cleansing.

GDC advised that they have a full contingent of staff now and are confident that they will be able to address the non-compliances raised in this audit.

This audit found six non-compliances and makes six recommendations. The future risk rating of 38 indicates that the next audit be completed in three months. I have considered this in conjunction with Meridian's comments and Meridian's efforts to engage the customer to make improvement and recommend that the next audit be in six months time.

## PARTICIPANT RESPONSE

Meridian have reviewed this report, and their comments are recorded in the body of the report. No further comments were provided.