

**ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT**

For

**WESTLAND DISTRICT COUNCIL AND
MERIDIAN ENERGY LIMITED
NZBN: 9429041923603**

Prepared by: Steve Woods

Date audit commenced: 16 August 2021

Date audit report completed: 28 September 2021

Audit report due date: 1 Dec 2021

TABLE OF CONTENTS

Executive summary	3
Audit summary	4
Non-compliances	4
Recommendations	5
Issues 5	
1. Administrative	6
1.1. Exemptions from Obligations to Comply with Code	6
1.2. Structure of Organisation	6
1.3. Persons involved in this audit	7
1.4. Hardware and Software	7
1.5. Breaches or Breach Allegations	7
1.6. ICP Data	8
1.7. Authorisation Received	8
1.8. Scope of Audit	8
1.9. Summary of previous audit	9
1.10. Distributed unmetered load audits (Clause 16A.26 and 17.295F)	10
2. DUML database requirements	11
2.1. Deriving submission information (Clause 11(1) of Schedule 15.3)	11
2.2. ICP identifier and items of load (Clause 11(2)(a) and (aa) of Schedule 15.3)	12
2.3. Location of each item of load (Clause 11(2)(b) of Schedule 15.3)	13
2.4. Description and capacity of load (Clause 11(2)(c) and (d) of Schedule 15.3)	13
2.5. All load recorded in database (Clause 11(2A) of Schedule 15.3)	14
2.6. Tracking of load changes (Clause 11(3) of Schedule 15.3)	16
2.7. Audit trail (Clause 11(4) of Schedule 15.3)	16
3. Accuracy of DUML database	17
3.1. Database accuracy (Clause 15.2 and 15.37B(b))	17
3.2. Volume information accuracy (Clause 15.2 and 15.37B(c))	20
Conclusion	23
Participant response	24

EXECUTIVE SUMMARY

This audit of the **Westland District Council (WDC)** 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 Arc GIS database used for submission is managed by ElectroNet, on behalf of Westpower. New connection, fault, and maintenance work is completed by ElectroNet, who update the GIS in the field using Arc GIS collector. ElectroNet provide a monthly report from the database to Meridian.

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. I compared the Westland database provided to the capacity information Meridian supplied to EMS for the month of July 2021 and I confirm it matches.

Database accuracy is described as follows:

Result	Percentage	Comments
The point estimate of R	94.7	Wattage from survey is higher than the database wattage by 5.9%
R _L	90.3	With a 95% level of confidence, it can be concluded that the error could be between -9.7% and +6.4%
R _H	106.4	

The variability of the sample results across the strata means that the true wattage (installed in the field) could be between 9.7% lower and 6.4% higher than the wattage recorded in the DUML database. Non-compliance is recorded because the potential error is greater than $\pm 5.0\%$.

In absolute terms the installed capacity is estimated to be 3 kW lower than the database indicates.

There is a 95% level of confidence that the installed capacity is between 5 kW lower to 3 kW higher than the database.

In absolute terms, total annual consumption is estimated to be 11,000 kWh lower than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 20,200 kWh p.a. lower to 13,300 kWh p.a. higher than the database indicates.

The audit identified four non-compliances and repeats one recommendation. The future risk rating of eight indicates that the next audit be completed in 18 months. I have considered this in conjunction with Meridian's responses and recommend that the next audit be in 18 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	The data used for submission does not track changes at a daily basis and is provided as a snapshot. In absolute terms, total annual consumption is estimated to be 11,000 kWh lower than the DUML database indicates. Five lights recorded with a light type of "Other".	Moderate	Low	2	Identified
All load recorded in database	2.5	11(2A) of Schedule 15.3	Four additional lights found in the field not added to database.	Moderate	Low	2	Identified
Database accuracy	3.1	15.2 and 15.37B(b)	Database is not confirmed as accurate with a 95% level of confidence resulting in an estimated under submission of 11,000 kWh per annum. Five lights recorded with a light type of "Other".	Moderate	Low	2	Identified
Volume information accuracy	3.2	15.2 and 15.37B(c)	The data used for submission does not track changes at a daily basis and is provided as a snapshot. In absolute terms, total annual consumption is estimated to be 11,000 kWh lower than the DUML database indicates. Five lights recorded with a light type of "Other".	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
Location of each item of load	2.3	Align items of load with a single street with uniform spelling of street names.

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

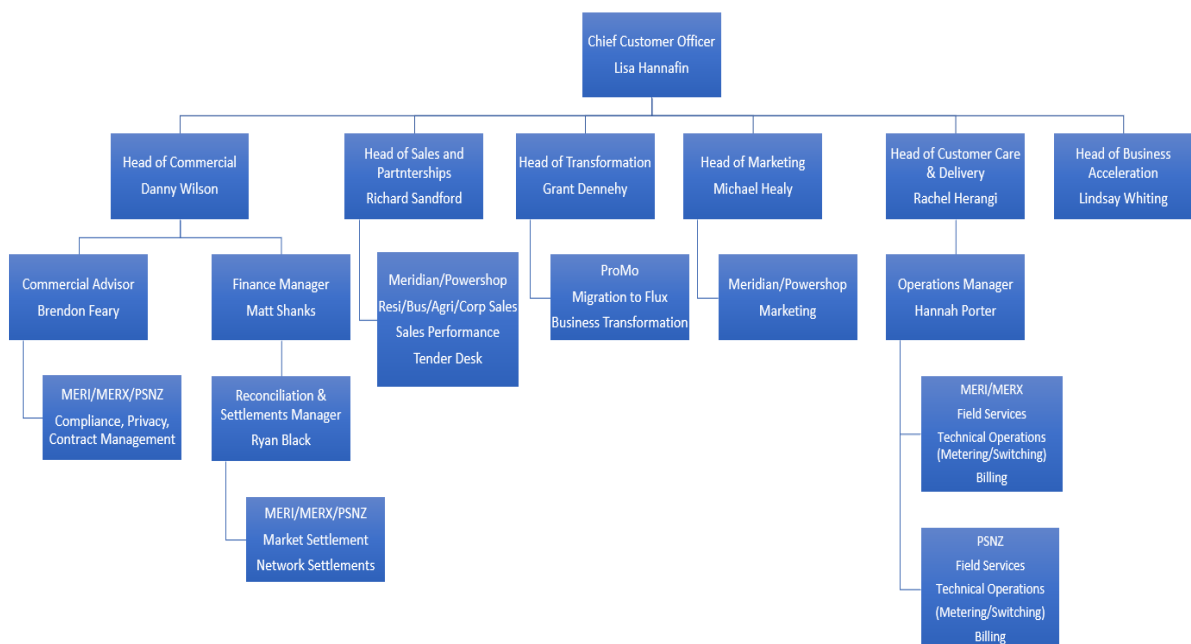
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

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

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

Other personnel assisting in this audit were:

Name	Title	Company
Amy Cooper	Compliance Officer	Meridian Energy
Danial Lau	Energy Data Analyst	Meridian Energy
Violet Penty	Asset Support Officer	Electronet
Chris Busson	GIS Administrator	ElectroNet
Danielle Sollitt	GIS Technician	ElectroNet

1.4. Hardware and Software

The Arc GIS SQL database used for the management of DUMML is managed by ElectroNet. The database back up is in accordance with standard industry procedures. Access to the database is restricted using a login and password.

EMS and Meridian systems used in the process are discussed in their agent and reconciliation participant audit reports.

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)
0000950050WPE41	HOKITIKA S/LIGHTS HKK0661	HKK0661	DST	415	34,593
0000950070WP314	RURAL S/LIGHTS HKK0661	HKK0661	DST	172	11,871
0000950071WPF51	WDC KUM0661 SL AC	KUM0661	DST	28	2,018
0000950072WP391	WDC OTI1011 SL AC	OTI1011	DST	1	160
Total				616	48,642

1.7. Authorisation Received

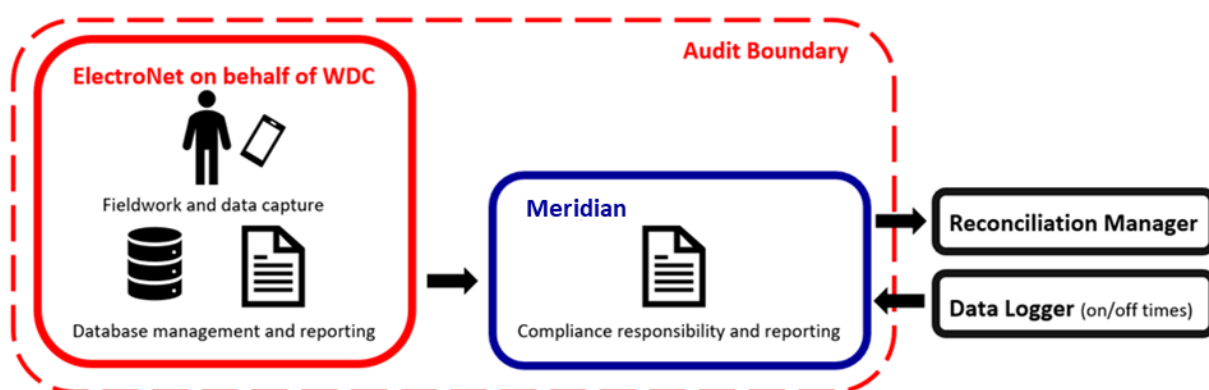
All information was provided directly by Meridian and ElectroNet.

1.8. Scope of Audit

This audit of the Westland DC DUMML 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 Arc GIS database used for submission is managed by ElectroNet, on behalf of Westpower. New connection, fault, and maintenance work is completed by ElectroNet, who update the GIS in the field using Arc GIS collector. ElectroNet provide a monthly report from the database to Meridian.

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.



1.9. Summary of previous audit

Meridian provided a copy of the last audit completed in May 2020 by Rebecca Elliot of Veritek Limited for Trustpower. The table below records the findings.

Table of Non-compliance

Subject	Section	Clause	Non-Compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	Database discrepancies and incorrect ballasts not corrected from last audit. The data used for submission does not track changes at a daily basis and is provided as a snapshot.	Cleared Still existing
All load recorded in database	2.5	11(2A) of Schedule 15.3	Five additional lights found in the field not added to database.	Existing for different lights
Database accuracy	3.1	15.2 and 15.37B(b)	Two items of load with the incorrect ballast applied. Database discrepancies not corrected from last audit.	Cleared Cleared
Volume information accuracy	3.2	15.2 and 15.37B(c)	Database discrepancies and incorrect ballasts not corrected from last audit. The data used for submission does not track changes at a daily basis and is provided as a snapshot.	Cleared Still existing

Table of recommendations

Subject	Section	Recommendation for Improvement	Status
Location of each item of load	2.3	Align items of load with a single street with uniform spelling of street names	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 within the required timeframe.

Audit outcome

Compliant

2. DUMML DATABASE REQUIREMENTS

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

Code reference

Clause 11(1) of Schedule 15.3

Code related audit information

The retailer must ensure the:

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

Audit observation

The process for calculation of consumption was examined.

Audit commentary

Meridian reconciles this DUMML load using the DST profile. I compared the Westland database provided to the capacity information Meridian supplied to EMS for the month of July 2021 and I confirm it matches. The field audit found that in absolute terms, total annual consumption is estimated to be 11,000 kWh lower than the DUMML database indicates.

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.

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 DUMML load and volumes.

The current data used is a snapshot and this practice is non-compliant.

Audit outcome

Non-compliant

Non-compliance	Description		
<p>Audit Ref: 2.1</p> <p>With: Clause 11(1) of Schedule 15.3</p> <p>From: 29-May-20</p> <p>To: 27-Aug-21</p>	<p>The data used for submission does not track changes at a daily basis and is provided as a snapshot.</p> <p>In absolute terms, total annual consumption is estimated to be 11,000 kWh lower than the DUMML database indicates.</p> <p>Five lights recorded with a light type of "Other".</p> <p>Potential impact: Low</p> <p>Actual impact: Low</p> <p>Audit history: Twice previously</p> <p>Controls: Moderate</p> <p>Breach risk rating: 2</p>		
Audit risk rating	Rationale for audit risk rating		
Low	<p>The controls are rated as moderate, because they are sufficient to ensure that lamp information is correctly recorded most of the time.</p> <p>The audit risk rating is low due to the small number of errors found in the field audit and the database is relatively static.</p>		
Actions taken to resolve the issue		Completion date	Remedial action status
We have advised Westland Council of inaccuracies and requested to correct.		Completed	Identified
We have recommended to Westland DC reviewing improvements to the database maintenance processes so that these are received more regularly as they occur.		Completed	
Preventative actions taken to ensure no further issues will occur		Completion date	
We will follow up with Westland Council in regard to the inaccuracies, corrections, and improvement to maintenance processes		28/02/2021	
We will consider reviewing the database information on how we provide a more accurate snapshot from the date of when the lights have been changed		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 DUMML database must contain:

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

Audit observation

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

Audit commentary

All items of load have an ICP number recorded.

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 DUMML database must contain the location of each DUMML item.

Audit observation

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

Audit commentary

All items of load have a GPS location recorded, and most items of load also have a street address recorded. In the previous audit it was recommended that the address fields be reviewed to associate an item of load with a single street rather than the current range of physical address descriptions and street name variances. I repeat this recommendation as the address descriptions remained unchanged. The GPS co-ordinates provide the detail for the specific location.

Description	Recommendation	Audited party comment	Remedial action
Location of each item of load	Align items of load with a single street with a uniform format of street names.	We have passed this recommendation on to the Council for their consideration.	Investigating

Audit outcome

Compliant

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

Code reference

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

Code related audit information

The DUMML database must contain:

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

Audit observation

The database was checked to confirm 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 light type description including the light wattage, and total wattage including ballast is recorded in the database for all items of load.

Five lights have 'Other' recorded for the light type. The accuracy of the lamp description, capacity and ballasts recorded is discussed in **section 3.1**.

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

In the last two audits it was recorded that ElectroNet were planning to split the total wattage into lamp and ballast wattage fields. Electronet have advised this will not be progressed.

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

A field audit of a statistical sample of 139 items of load was undertaken on 15th September 2021.

Audit commentary

The field audit findings for the sample of lamps was accurate with the exception of the streets detailed in the table below:

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
Greenstone Road	5	7	+2	1	50W SON recorded in the database but 22W LED found in the field 2 x 70W SON found in the field
32 Butlers Road	5	5		1	1 x 70W SON recorded in the database but 22W LED found in the field
90 Second Street	1	1		1	1 x 20W Fluro recorded in the database but 22W LED found in the field
Airport Drive	10	10		2	2 x 70W SON recorded in the database but 2 x 22 W LED found in the field
Jollie Street	12	13	+1	1	1 x 22W LED found in the field 1 x 70W SON recorded in the database but 1 x 22W LED found in the field
Kaniere Road	14	14		3	2 x 70W SON recorded in the database but 2 x 22W LED found in the field 1 x 50W SON recorded in the database but 1 x 22W LED found in the field
Kaniere Tram Road	3	3		1	1 x 70W SON recorded in the database but 1 x 22W LED found in the field

Livingstone Street	5	6	+1	1	1 x 125W MBF recorded in the database but 1 x 50W SON found in the field 1 x 22 W LED found in the field
Park Street	5	5		1	1 x 70 W SON recorded in the database but 1 x 22W LED found in the field
Rolleston Street	12	12		1	1 x 50W SON recorded in the database but 1 x 70W SON found in the field
Sale Street	6	6		1	1 x 70W SON in the database but 1 x 22 W LED in the field
Stafford St	23	23		4	4 x 150W SON recorded in the database but 4 x 103W LED found in the field
Total	101	105	4	18	

There were four additional items of load found in the field. This is recorded as a non-compliance. The database accuracy is discussed in **section 3.1**.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3 From: 29-May-20 To: 27-Aug-21	Four additional lights found in the field not added to database. Potential impact: Low Actual impact: Low Audit history: Three times previously Controls: Moderate Breach risk rating: 2		
Audit risk rating	Rationale for audit risk rating		
Low	The controls are rated as moderate as they are sufficient to ensure that all lights are recorded in the database most of the time. The audit risk rating is low due to the small number of additional lights found in the field audit and the database is relatively static.		
Actions taken to resolve the issue		Completion date	Remedial action status
We have advised Westland Council of inaccuracies and requested to correct.		Completed	Identified
We have recommended Westland DC review improvements to the database maintenance processes so that these are received more regularly as they occur.		Completed	
Preventative actions taken to ensure no further issues will occur		Completion date	
We will follow up with Westland Council in regard to the inaccuracies, corrections, and improvement to maintenance processes.		28/02/2021	

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

Code reference

Clause 11(3) of Schedule 15.3

Code related audit information

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

Audit observation

The process for tracking of changes in the database was examined.

Audit commentary

The ElectroNet database functionality achieves compliance with the code.

Audit outcome

Compliant

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

Code reference

Clause 11(4) of Schedule 15.3

Code related audit information

The DUMML database must incorporate an audit trail of all additions and changes that identify:

- *the before and after values for changes*
- *the date and time of the change or addition*
- *the person who made the addition or change to the database.*

Audit observation

The database was checked for audit trails.

Audit commentary

The database has a complete and compliant audit trail.

Audit outcome

Compliant

3. ACCURACY OF DUML DATABASE

3.1. Database accuracy (Clause 15.2 and 15.37B(b))

Code reference

Clause 15.2 and 15.37B(b)

Code related audit information

Audit must verify that the information recorded in the retailer's DUML database is complete and accurate.

Audit observation

The DUML Statistical Sampling Guideline was used to determine the database accuracy. The table below shows the survey plan.

Plan Item	Comments
Area of interest	Westland DC streetlights.
Strata	The database contains 616 items of load in the Westland DC region. The management process is the same for all lights. I created two strata: 1. Rural and 2. Urban.
Area units	I created a pivot table of the roads, and I used a random number generator in a spreadsheet to select a total of 30 sub-units.
Total items of load	139 items of load were checked.

Wattages were checked for alignment with the published standardised wattage table produced by the Electricity Authority, and the manufacturer's specifications or in the case of LED lights against the LED light specification.

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

Audit commentary

Database accuracy

A field audit was conducted of a statistical sample of 139 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	94.7	Wattage from the survey is lower than the database wattage by 5.3%
R _L	90.3	With a 95% level of confidence, it can be concluded that the error could be between -9.7% and +6.4%.
R _H	106.4	

These results were categorised in accordance with the "Distributed Unmetered Load Statistical Sampling Audit Guideline", effective from 1 February 2019. 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 6.4% higher and 9.7% lower than the wattage recorded in the DUML database. Non-compliance is recorded because the potential error is greater than 5.0%.

In absolute terms the installed capacity is estimated to be 3 kW lower than the database indicates.

There is a 95% level of confidence that the installed capacity is between 5 kW lower and 3kW higher than the database.

In absolute terms, total annual consumption is estimated to be 11,000 kWh lower than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 20,200 lower and 13,300 kWh higher than the database indicates.

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

Audit commentary

Lamp description and capacity accuracy

Wattages for all items of load were checked against the published standardised wattage tables produced by the Electricity Authority. As discussed in **section 2.4**, all lights have a lamp and gear wattage recorded. There are five lights recorded with a light type of "Other". The details are insufficient to determine if the correct wattage has been recorded, all other wattages were confirmed to be correct.

Change management process findings

There have been no changes to the processes in place during the audit period. The Arc GIS database used for submission is managed by ElectroNet, on behalf of Westpower. New connection, fault, and maintenance work is completed by ElectroNet, who update the GIS in the field using Arc GIS collector. ElectroNet office staff validate the data and post it to the database after the field devices are synchronised to the main database.

Most new connections relate to network extensions, and new subdivisions are rare. There were no new lights connected during the audit period. When new subdivisions are created, Westpower ensure that the installation is compliant and provides approval for connection.

A process workflow in the Maximo system is used to manage all new connections and includes a step to update GIS information. Maximo tasks are normally allocated to a work group rather than individual, and key tasks are escalated within Maximo if not completed within specified timeframes. Tasks can be reassigned as necessary. Once the installation job is complete, a work task is created for the GIS team to check the Arc GIS database is up to date.

Westland DC currently has no plans to roll out LED lights to replace the existing lights in the council area. LEDs are used to replace faulty lights where necessary and for new lamp connections.

The database contains some permanent festive lighting, and the seasonal festive lights are added to the database when are electrically connected and removed when they are disconnected.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 30-May-20 To: 27-Aug-21	Database is not confirmed as accurate with a 95% level of confidence resulting in an estimated under submission of 11,000 kWh per annum. Five lights recorded with a light type of "Other". 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	The controls are rated as moderate as they are sufficient to ensure that all lights are recorded in the database most of the time. The audit risk rating is low due to the small number of errors found in the field audit and the database is relatively static.		
Actions taken to resolve the issue		Completion date	Remedial action status
We have advised Westland Council of inaccuracies and requested to correct.		Completed	Identified
We have recommended to Westland DC reviewing improvements to the database maintenance processes so that these are received more regularly as they occur.		Completed	
We will follow up with Westland Council in regard to the inaccuracies, corrections, and improvement to maintenance processes.		28/02/2021	

3.2. Volume information accuracy (Clause 15.2 and 15.37B(c))

Code reference

Clause 15.2 and 15.37B(c)

Code related audit information

The audit must verify that:

- *volume information for the DUML is being calculated accurately*
- *profiles for DUML have been correctly applied.*

Audit observation

The submission was checked for accuracy for the month the database extract was supplied. This included:

- checking the registry to confirm that all ICPs have the correct profile and submission flag, and
- checking the database extract combined with the burn hours against the submitted figure to confirm accuracy.

Audit commentary

Meridian reconciles this DUML load using the DST profile. I compared the Westland database provided to the capacity information Meridian supplied to EMS for the month of July 2021 and I confirm it matches. The field audit confirmed the database is not accurate within the acceptable +/-5% accuracy threshold.

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.

There are five lights recorded with a light type of "Other". The details are insufficient to determine if the correct wattage has been recorded. The database accuracy is discussed in **section 3.1**.

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

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

The current data used is a snapshot and this practice is non-compliant.

Audit outcome

Non-compliant

Non-compliance	Description		
<p>Audit Ref: 3.2</p> <p>With: Clause 15.2 and 15.37B(c)</p> <p>From: 29-May-20</p> <p>To: 27-Aug-21</p>	<p>The data used for submission does not track changes at a daily basis and is provided as a snapshot.</p> <p>In absolute terms, total annual consumption is estimated to be 11,000 kWh lower than the DUMML database indicates.</p> <p>Five lights recorded with a light type of "Other".</p> <p>Potential impact: Low</p> <p>Actual impact: Low</p> <p>Audit history: Twice previously</p> <p>Controls: Moderate</p> <p>Breach risk rating: 2</p>		
Audit risk rating	Rationale for audit risk rating		
Low	<p>The controls are rated as moderate, because they are sufficient to ensure that lamp information is correctly recorded most of the time.</p> <p>The audit risk rating is low due to the small number of errors found in the field audit and the database is relatively static.</p>		
Actions taken to resolve the issue		Completion date	Remedial action status
We have advised Westland Council of inaccuracies and requested to correct.		Completed	Identified
We have recommended Westland DC review improvements to the database maintenance processes so that these are received more regularly as they occur.		Completed	
Preventative actions taken to ensure no further issues will occur		Completion date	
We will follow up with Westland Council in regard to the inaccuracies, corrections, and improvement to maintenance processes		28/02/2021	
We will consider reviewing the database information on how we provide a more accurate snapshot from the date of when the lights have been changed.		Ongoing	

CONCLUSION

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

The Arc GIS database used for submission is managed by ElectroNet, on behalf of Westpower. New connection, fault, and maintenance work is completed by ElectroNet, who update the GIS in the field using Arc GIS collector. ElectroNet provide a monthly report from the database to Meridian.

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. I compared the Westland database provided to the capacity information Meridian supplied to EMS for the month of July 2021 and I confirm it matches.

Database accuracy is described as follows:

Result	Percentage	Comments
The point estimate of R	94.7	Wattage from survey is higher than the database wattage by 5.9%
R _L	90.3	With a 95% level of confidence, it can be concluded that the error could be between -9.7% and +6.4%
R _H	106.4	

The variability of the sample results across the strata means that the true wattage (installed in the field) could be between 9.7% lower and 6.4% higher than the wattage recorded in the DUML database. Non-compliance is recorded because the potential error is greater than $\pm 5.0\%$.

In absolute terms the installed capacity is estimated to be 3 kW lower than the database indicates.

There is a 95% level of confidence that the installed capacity is between 5 kW lower to 3 kW higher than the database.

In absolute terms, total annual consumption is estimated to be 11,000 kWh lower than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 20,200 kWh p.a. lower to 13,300 kWh p.a. higher than the database indicates.

The audit identified four non-compliances and repeats one recommendation. The future risk rating of eight indicates that the next audit be completed in 18 months. I have considered this in conjunction with Meridian's responses and recommend that the next audit be in 18 months.

PARTICIPANT RESPONSE

Meridian has reviewed this report and their comments are contained within the report.