ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

For

WESTLAND DISTRICT COUNCIL AND MERIDIAN ENERGY LIMITED

Prepared by: Rebecca Elliot

Date audit commenced: 3 May 2020

Date audit report completed: 28 May 2020

Audit report due date: 1 June 2020

TABLE OF CONTENTS

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 largely conducted in accordance with the audit guidelines for DUML audits version 1.1. A field audit was not undertaken due to the restrictions imposed by the Covid-19 lockdown; therefore, the results of the 2019 field audit were checked to ensure the database was updated.

There were six discrepancies found in the 2019 field audit which had not been addressed at the time of the database extract. The database was subsequently updated prior to the audit being finalised.

There were two items of load which have the incorrect ballast recorded.

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 Westland District Council streetlights have undergone very few changes during the audit period. There has been no large-scale LED rollout and no new connections.

The future risk rating of eight indicates that the next audit be completed in 18 months. I agree with this recommendation.

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	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.	Moderate	Low	2	Investigating
All load recorded in database	2.5	11(2A) of Schedule 15.3	Five additional lights found in the field not added to database.	Moderate	Low	2	Cleared
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.	Moderate	Low	2	Identified
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.	Moderate	Low	2	Investigating
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 a uniform format 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

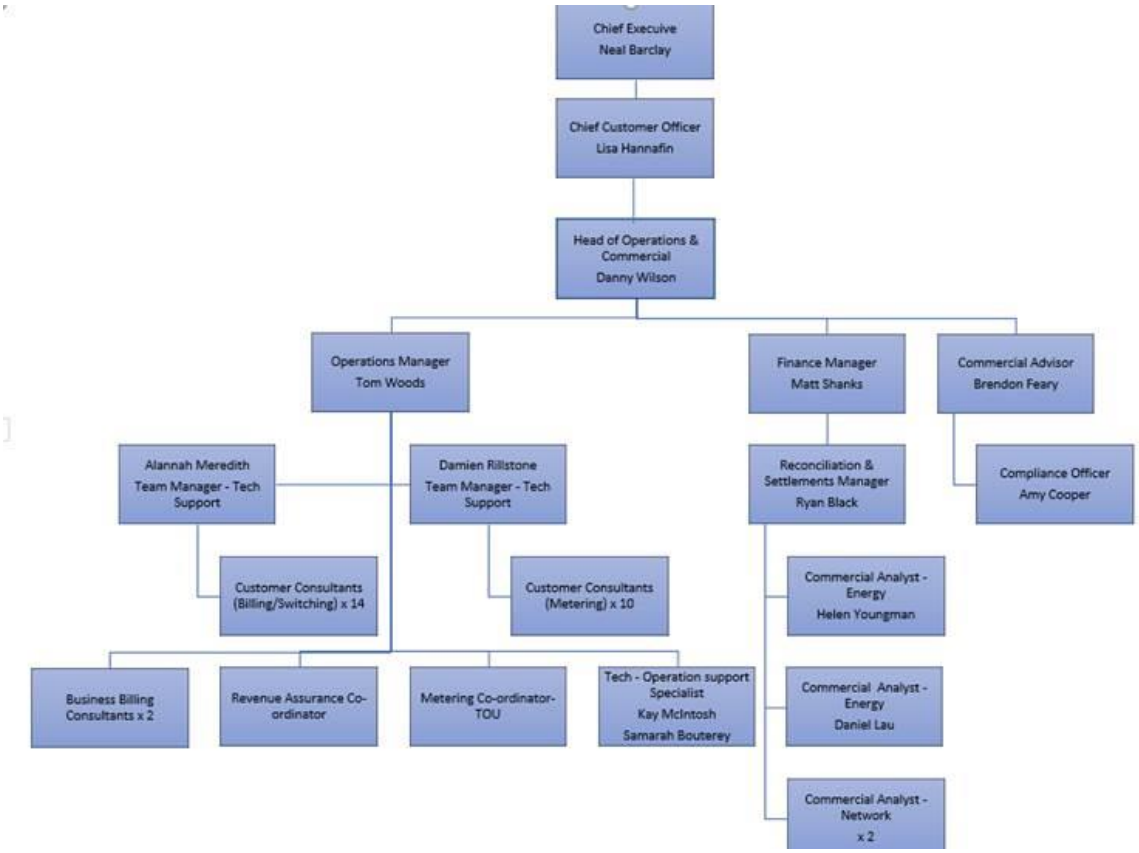
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

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

Auditors:

Rebecca Elliot

Veritek Limited

Electricity Authority Approved Auditor

Supporting Auditor:

Brett Piskulic

Veritek Limited

Electricity Authority Approved Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Amy Cooper	Compliance Officer	Meridian Energy
Helen Youngman	Energy Data Analyst	Meridian Energy
Violet Penty	Asset Support Officer	Electronet
Cary Lancaster	GIS Administrator	ElectroNet
Danielle Sollitt	Asset Systems Cadet	ElectroNet

1.4. Hardware and Software

The Arc GIS SQL database used for the management of DUML 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	4015	39,389
0000950070WP314	RURAL S/LIGHTS HKK0661	HKK0661	DST	161	14,402
0000950071WPF51	WDC KUM0661 SL AC	KUM0661	DST	27	1,894
0000950072WP391	WDC OTI1011 SL AC	OTI0111	DST	1	160
			Total	**594**	**55,845**

1.7. Authorisation Received

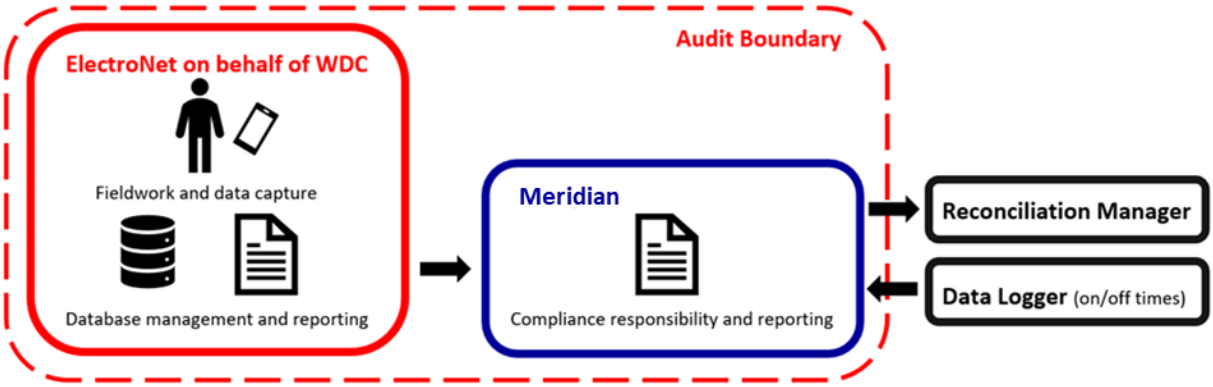
All information was provided directly by Meridian and ElectroNet.

1.8. Scope of Audit

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 audit was largely conducted in accordance with the audit guidelines for DUML audits version 1.1. A field audit was not undertaken due to the restrictions imposed by the Covid-19 lockdown; therefore, the results of the 2019 field audit were checked to ensure the database was updated.

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 2019 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	The database used to prepare submissions contains some inaccurate information.	Still existing
Description and capacity of load	2.4	11(2)(c) and (d) of Schedule 15.3	14 items of load have missing capacity and/or wattage information.	Cleared
All load recorded in database	2.5	11(2A) of Schedule 15.3	Five additional lights found in the field.	Cleared
Database accuracy	3.1	15.2 and 15.37B(b)	2 items of load with the incorrect ballast applied. 14 items of load have missing capacity and/or wattage information.	Still existing for some
Volume information accuracy	3.2	15.2 and 15.37B(c)	The database used to prepare submissions contains some inaccurate information.	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	Still existing
Tracking of load change	2.6	Trustpower to review change management processes with Electronet to ensure changes are tracked.	Cleared

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.

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. This information is 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 has been audited to confirm its accuracy and compliance. Compliance is confirmed.

I checked the March 2020 extract provided by ElectroNet against the submission totals supplied by Meridian and found that submission matched the database.

Database discrepancies and incorrect ballasts not corrected from last audit are recorded below and 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
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 07-May-18 To: 13-May-20	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. 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, because they are sufficient to ensure that lamp information is correctly recorded 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
As reported the database discrepancies identified during the last field audit have now been resolved. We will request the 2 remaining incorrect ballasts recorded be updated. We are considering how we can redesign our processes to incorporate the calculation of volumes at a daily level rather than a monthly snapshot.	Complete 30 June 2020 Ongoing	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Current controls for management of database changes are considered adequate.		

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

Code reference

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

Code related audit information

The DUML database must contain:

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

Audit observation

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

Audit commentary

All items of load 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 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

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 will recommend this clean up of address information be undertaken.	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 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 lamp type and wattage capacity and included any ballast or gear wattage.

Audit commentary

The database records light type and total wattage, including ballast. In the last two audits it was recorded that ElectroNet were planning to split the total wattage into lamp and ballast wattage fields. This has not been progressed.

The database was checked and found that the light type and wattage were recorded for all items of load. In the previous audit there were 15 items of load with missing or unknown light type information and/or zero or blank lamp wattage.

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 141 items of load was undertaken on 10-12 April 2019. The sample was selected from two strata:

- Urban
- Rural.

Audit commentary

The 2019 field audit findings are detailed in the table below.

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
Kaniere Rd (Hokitika)	22	24	+2		2x extra 75W LED pedestrian crossing lights outside Dairy Factory
Park Street	2	2	+2		2x extra 70W HPS found in the field
Second Street	2	2		1	1x incorrect wattage 55W light recorded in the database but 2x 20W fluorescent found in the field
Airport Drive	9	10	+1	-	1x extra 70W HPS found in the field
Total	**141**	**146**	**5**	**1**	

I checked the database and found that the five additional items found in the last audit had not been added at the time of the database extract. The database was subsequently updated prior to the audit being finalised. The additional lights are recorded as non-compliance below.

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: 07-May-18 To: 13-May-20	Five additional lights found in the field not added to database. 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 additional lights found in the field audit and the database is relatively static.

Actions taken to resolve the issue	Completion date	Remedial action status
As reported these discrepancies have now been resolved.	Complete	Cleared
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Current controls for management of database changes are considered adequate.		

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 ElectroNet database functionality achieves compliance with the code. The change management process and the compliance of the database reporting provided to Meridian is detailed in **sections 3.1** and **3.2**.

Audit outcome

Compliant

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

Code reference

Clause 11(4) of Schedule 15.3

Code related audit information

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

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

Audit observation

The database was checked for audit trails.

Audit commentary

ElectroNet demonstrated a complete audit trail of all additions and changes to the database information. There is a history table in the database which records the details of all changes made including historical lamp information.

ElectroNet staff take a copy of the GIS database into the field on a device, and modify, add and delete data as required when tasks are completed. When the device is synchronised, the new records are inserted into the main database.

Staff in the office post and reconcile the data. This process involves:

- an automatic comparison between the original data in the device and the current data in the GIS, to determine whether changes to the main database have occurred since the device was last synchronised; if changes have occurred, an exception is created for manual investigation; and
- a manual check of the changed data to confirm it is correct and reasonable.

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

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

The findings of the field audit undertaken during the last audit were reviewed to determine if the database had been updated.

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

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 reported in the last two audits two items of load have the incorrect ballast recorded. This is detailed in the table below:

Lamp Type	Database Total Wattage	EA Standardised Wattage	Variance	Database Quantity	Estimated Annual kWh effect on consumption
70W SON E	83	77	+6	2	+51.25 kWh

The incorrect capacities will be resulting in an estimated over submission of 51.25 kWh per annum (based on annual burn hours of 4,271 as is detailed in the DUML database auditing tool).

Previous field audit findings

I checked if the database had been updated to reflect the findings of the field audit undertaken during the last audit.

There were six discrepancies found in the 2019 field audit which had not been addressed at the time of the database extract. The database was subsequently updated prior to the audit being finalised. The discrepancies are detailed in the following table:

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
Kaniere Rd (Hokitika)	22	24	+2		2x extra 75W LED pedestrian crossing lights outside Dairy Factory
Park Street	2	2	+2		2x extra 70W HPS found in the field
Second Street	2	2		1	1x incorrect wattage 55W light recorded in the database but 2x 20W fluorescent found in the field
Airport Drive	9	10	+1	-	1x extra 70W HPS found in the field
Total	**141**	**146**	**5**	**1**	

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.

Periodic outage patrols are conducted by Electronet. Faults and outages are also reported to WDC, who inform Electronet. When any field work required is completed, the database is updated if necessary.

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: 07-May-18 To: 13-May-20	Two items of load with the incorrect ballast applied. Database discrepancies not corrected from last audit. Potential impact: Low Actual impact: Low Audit history: Once 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 will request to 2 incorrect ballasts be updated. Database discrepancies identified during the last field audit have now been corrected	30 June 2020 Complete	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Current controls for management of database changes are considered adequate.		

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, submissions are based on the database information, with on and off times derived from data logger information.

I checked the submissions for March 2020 which confirmed that the calculation method and total was correct.

Database discrepancies and incorrect ballasts not corrected from last audit are recorded in **section 2.1** and 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 used is a snapshot and this practice is non-compliant. As there have been minimal changes to the database since 2018 there has been no impact on submission.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: 07-May-18 To: 13-May-20	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. 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, because they are sufficient to ensure that lamp information is correctly recorded 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
As reported the database discrepancies identified during the last field audit have now been resolved.	Complete	Investigating
We will request the 2 remaining incorrect ballasts recorded be updated.	30 June 2020	
We are considering how we can redesign our processes to incorporate the calculation of volumes at a daily level rather than a monthly snapshot.	Ongoing	

Preventative actions taken to ensure no further issues will occur	Completion date	
Current controls for management of database changes are considered adequate.		

CONCLUSION

The audit was largely conducted in accordance with the audit guidelines for DUML audits version 1.1. A field audit was not undertaken due to the restrictions imposed by the Covid-19 lockdown; therefore, the results of the 2019 field audit were checked to ensure the database was updated.

There were six discrepancies found in the 2019 field audit which had not been addressed at the time of the database extract. The database was subsequently updated prior to the audit being finalised.

There were two items of load which have the incorrect ballast recorded.

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 Westland District Council streetlights have undergone very few changes during the audit period. There has been no large-scale LED rollout and no new connections.

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 comments and I agree with this recommendation.

PARTICIPANT RESPONSE