ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

For

ASHBURTON DISTRICT COUNCIL AND MERIDIAN ENERGY LIMITED

Prepared by: Tara Gannon

Date audit commenced: 7 April 2019

Date audit report completed: 21 May 2019

Audit report due date: 1 June 2019

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EXECUTIVE SUMMARY

This audit of the **Asburton District Council (ADC)** 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.

ADC's DUML ICPs switched from Trustpower to Meridian effective from 01/04/19. The NZTA ICPs 0000033381EAF01 and 0000033382EA3C1 are included in the database, but are still supplied by Trustpower, so are excluded from the scope of this audit and subject to a separate audit for Trustpower.

A RAMM database is held by ADC, who is Meridian's customer. **Electricity Ashburton (EA Networks)** are responsible for new connections, fault, maintenance and upgrade work, and maintain the database. ADC also works with EA Networks to complete some RAMM updates, particularly where new streetlight types are entered or bulk updates occur for LED upgrades.

A monthly report from the database is provided to Meridian, and used to calculate submissions. Meridian submits the DUML load as NHH 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 EMS' agent audit.

Five non-compliances were identified, and two recommendations were raised. The future risk rating of 32 indicates that the next audit be completed in three months. Most of the non-compliance relates to timing differences for LED upgrades, which has led to over submission. LED lights are updated in bulk when a claim is received, and the database may be updated well after the lamp has been upgraded. I note that the LED upgrade project is nearing completion and it is expected that once all these updates are processed accuracy will improve significantly. Based on this, and the comments received, I recommend the next audit be completed in nine months to allow time to update records for the upgraded lights and resolve the other non-compliances.

The matters raised are detailed below:

AUDIT SUMMARY

NON-COMPLIANCES

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Deriving submission information	2.1	11(1) of Schedule 15.3	The database contains some inaccurate data.	Weak	High	9	Identified
ICP identifier and items of load	2.2	11(2)(a) and (aa) of Schedule 15.3	Four lights were assigned to an ICP which is not settled.	Moderate	Low	2	Identified
All load recorded in database	2.5	Clause 11(2A) of Schedule 15.3	Festive and decorative lights are not recorded in the database.	Weak	Low	3	Identified
Database accuracy	3.1	15.2 and 15.37B(b)	The database contains some inaccurate data.	Weak	High	9	Identified
Volume information accuracy	3.2	15.2 and 15.37B(c)	The database contains some inaccurate data.	Weak	High	9	Identified
Future Risk Rating							32

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	Description	Recommendation
All load recorded in database	2.5	Festive lights	Confirm the wattages for festive and decorative lights, and update RAMM. Communicate on and off dates for festive and decorative lights to Meridian.
Tracking of load changes	2.6	Private lights	I recommend the details of known private lights should be passed to EA Networks to create shared unmetered load or standard unmetered load as appropriate, and removed from the monthly wattage report once this is complete.

ISSUES

Subject	Section	Description	Issue
		Nil	

1. ADMINISTRATIVE

1.1. Exemptions from Obligations to Comply with Code

Code reference

Section 11 of Electricity Industry Act 2010.

Code related audit information

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

Audit observation

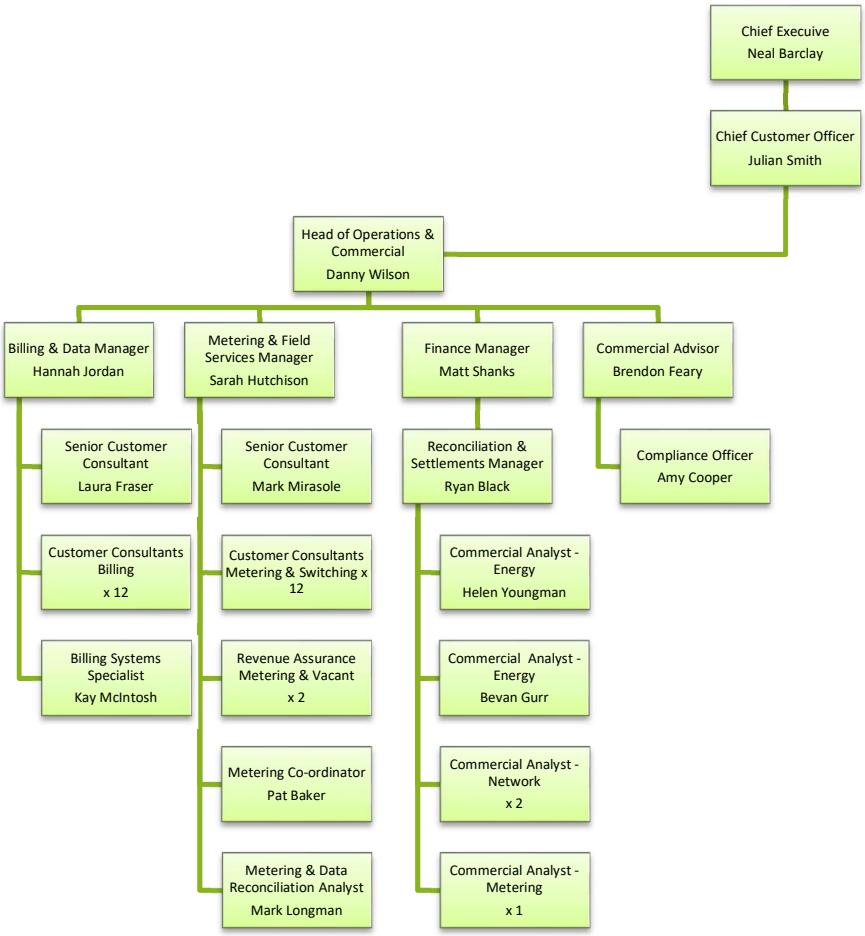
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

Audit commentary

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

1.2. Structure of Organisation

Meridian provided a copy of their organisational structure:



1.3. Persons involved in this audit

Auditor:

Tara Gannon

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
Deborah Barron	Asset Management Officer – Transportation	Ashburton District Council
Wayne Watson	Overhead Manager	Electricity Ashburton

1.4. Hardware and Software

The SQL database used for the management of DUML is remotely hosted by RAMM Software Ltd. The database is commonly known as "RAMM" which stands for "Roading Asset and Maintenance Management".

Database back-up is in accordance with standard industry procedures. Access to the database is secure by way of password protection.

1.5. Breaches or Breach Allegations

There are no breach allegations relevant to the scope of this audit.

1.6. ICP Data

ADC's DUML ICPs switched from Trustpower to Meridian effective from 01/04/19. NZTA ICPs 0000033381EAF01 and 0000033382EA3C1 are included in the database, but are still supplied by Trustpower, so are excluded from the scope of the audit and subject to a separate audit.

ICP Number	Description	NSP	Profile	Number of items of load	Database wattage (watts)
0000010559EAD7C	Ashburton District Council – Streetlighting	ASB0331	DST	27	5778
0000025163EA218	Ashburton District Council – Streetlighting	ASB0331	DST	2929	181922

ICP Number	Description	NSP	Profile	Number of items of load	Database wattage (watts)
0000025164EAFD2	Open Spaces - Parks and Amenities	ASB0331	DST	93	7845
0000030218EA553	Methven	ASB0661	DST	27	961
0000033381EAF01	NZTA Methven	ASB0331	STL	55	6471
0000033382EA3C1	NZTA not Methven	ASB0331	STL	383	64137

The database also includes:

- metered lights connected to ICPs 0000017831EA1F0 and 0000024967EA2BF;
- a small number of lights connected to 0000029898EAE52 and 0000030904EAFEE, which are validly treated as standard unmetered load;
- 0000000000EAXXX which is used to track lights which are installed but not yet live; and
- 0000000000EAZZZ which is used to track lights with unknown owners.

These additional ICPs are outside of the scope of the audit except 0000000000EAZZZ, which is discussed further in **section 2.2**.

1.7. Authorisation Received

All information was provided directly by Meridian, ADC and Electricity Ashburton.

1.8. Scope of Audit

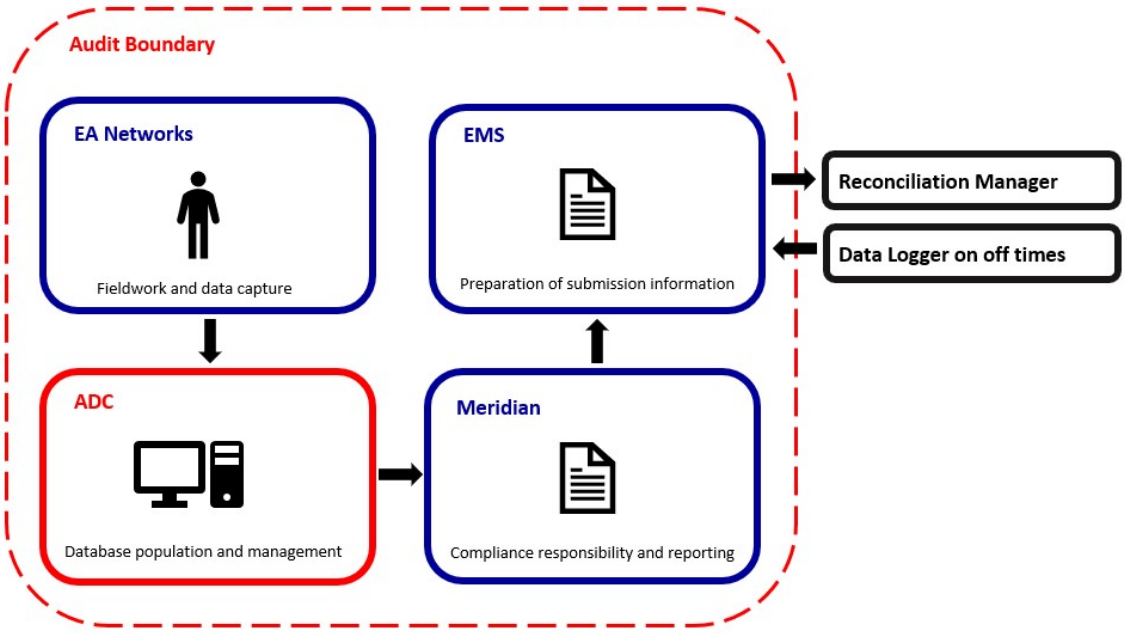
This audit of the ADC DUML database and processes was conducted at the request of Meridian in accordance with clause 15.37B. The purpose of this audit is to verify that the volume information is being calculated accurately, and that profiles have been correctly applied. The audit was conducted in accordance with the audit guidelines for DUML audits version 1.1.

ADC's DUML ICPs switched from Trustpower to Meridian effective from 01/04/19. NZTA ICPs 0000033381EAF01 and 0000033382EA3C1 are included in the database, but are still supplied by Trustpower, so are excluded from the scope of the audit and subject to a separate audit.

A RAMM database is held by ADC, who is Meridian's customer. EA Networks are responsible for new connections, fault, maintenance and upgrade work, and maintain the database. ADC also works with EA Networks to complete some RAMM updates, particularly where new streetlight types are entered or bulk updates occur for LED upgrades.

A monthly report from the database is provided to Meridian, and used to calculate submissions. Meridian submits the DUML load as NHH 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 EMS' agent audit.

The scope of the audit encompasses the collection, security and accuracy of the data, including the preparation of submission information based on the monthly reporting. The diagram below shows the flow of information and the audit boundary for clarity.



The field audit was undertaken of a statistical sample of 141 items of load on 7-9 April 2019.

1.9. Summary of previous audit

The previous audit was completed for Trustpower in March 2018 by Rebecca Elliot of Veritek Limited. Five non-compliances were found, and two recommendations were made. The status of the non-compliances and recommendations are detailed below:

Subject	Section	Clause	Non-compliance	Status
Deriving submission	2.1	11(1) of Schedule 15.3	Under submission of 15.04 kWh per month due to the rounding of the unmetered load kW figure to the nearest whole number. Accuracy ratio is 100.21% indicating under submission of 3,178 kWh per annum. 625 items of load with the incorrect ballast applied indicating under submission of 5,901 kWh per annum. Combined value of 9,079 kWh under submitted per annum.	Not relevant to Meridian Still existing, some database inaccuracies are present

Subject	Section	Clause	Non-compliance	Status
Recording of all load	2.5	11(2A) of Schedule 15.3	2 lights not found in the field.	Still existing, some load is not recorded in the database
Tracking of load change	2.6	11(3) of Schedule 15.3	Methven festival lights are not included in reporting to Trustpower.	Still existing, recorded in **section 2.5**
Database accuracy	3.1	Clause 15.2 & 15.37(b)	Accuracy ratio is 100.21% indicating under submission of 3,178 kWh per annum. 625 items of load with the incorrect ballast applied indicating under submission of 5,901 kWh per annum. Combined value of 9,079 kWh under submitted.	Still existing, some database inaccuracies are present
Volume information accuracy	3.2	Clause 15.2 & 15.37(c)	Under submission of 15.04 kWh per month due to the rounding of the unmetered load kW figure to the nearest whole number. Accuracy ratio is 100.21% indicating under submission of 3,178 kWh per annum. 625 items of load with the incorrect ballast applied indicating under submission of 5,901 kWh per annum. Combined value of 9,079 kWh under submitted per annum.	Not relevant to Meridian Still existing, some database inaccuracies are present

Subject	Section	Recommendation	Description	Status
Data transmission	1.10	20 of schedule 15.2	Add password protection to the monthly report.	Not implemented
Tracking of load change	2.6	11(3) of schedule 15.3	Field check that the light type provided in the as builts is what is installed in the field.	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. Compliance is confirmed.

NZTA ICPs 0000033381EAF01 and 0000033382EA3C1 are included in the database, but are still supplied by Trustpower, so are excluded from the scope of the audit and subject to a separate audit.

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

This clause requires that the distributed unmetered load database must satisfy the requirements of schedule 15.5 regarding the methodology for deriving submission information.

A monthly report from the database is provided to Meridian, and used to calculate submissions. Meridian submits the DUML load as NHH 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 EMS' agent audit.

The capacities supplied to EMS for April 2019 were checked and confirmed to be accurate.

Volume inaccuracy is present as follows:

Issue	Estimated volume information impact (annual kWh)
Potential over submission due to database inaccuracy identified during the field audit.	Potential over submission of 217,900 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).
Two lamps had incorrect gear wattages recorded, and were corrected during the audit.	Over submission of 8W or 34 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).
Five private lights which ADC is not responsible for were recorded in the database**.**	Over submission of 325W or 1388 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).
Festive and decorative lights are unmetered, but are not recorded in RAMM.	Unknown volume of under submission but expected to be minor.
Four lights had ICP 0000000000EAZZZ assigned, which is used to track lights with unknown owners and is not settled.	Under submission of 394W or 1,682 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: unknown To: 09-Apr-19	The database contains some inaccurate data. The field data is 73.9% of the database data for the sample checked. This will result in potential over submission of 217,900 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool). Two lamps had incorrect gear wattages recorded, and were corrected during the audit. The error resulted in over submission of 8W or 34 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool). Five private lights which ADC is not responsible for were recorded in the database against ADC DUML ICP 0000025163EA218, resulting in over submission of 325W or 1388 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool). Festive and decorative lights are unmetered, but are not recorded in RAMM. Four lights were assigned to an ICP which is not settled, resulting in under submission of 394W or 1682 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool). Potential impact: High Actual impact: Unknown Audit history: Once Controls: Weak Breach risk rating: 9
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as weak, because they are not sufficient to ensure that database wattage is accurate. The impact is assessed to be high based on the wattage differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
The LED upgrade program is now complete and all resulting changes to lamp information and wattages have been made in the database. As noted, this is expected to improve the accuracy of the database significantly as the majority of discrepancy found during the field audit were associated with upgraded lamps that had not been changed in the database.	May 2019	Identified
The council is in the process of identifying the lamps associated with the decorative and festive lighting so these can be added to the database.	Nov 2019	
The 4 lights that were assigned to an ICP that is not settled have now been assigned to the correct ICP	April 2019	
Preventative actions taken to ensure no further issues will occur	**Completion date**	
See above		

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 whether an ICP is recorded for each item of load.

Audit commentary

The analysis found that all items of load had an ICP number recorded.

Four lights had ICP 0000000000EAZZZ assigned, which is used to track lights with unknown owners and is not settled. ADC advised that the ICP numbers and owners will be updated for these ICPs.

Light ID	ICP Description	Area	Road Name	Lamp Model
8061	Unknown Owner	Lake Hood	LAKE HOOD DRIVE	SON 70w
7901	Unknown Owner	Tinwald	TINWALD DOMAIN ROAD3	SON 100w
7902	Unknown Owner	Tinwald	TINWALD DOMAIN ROAD3	SON 100w
8062	Unknown Owner	Lake Hood	TRENT PLACE	SON 70w

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.2 With: Clause 11(2)(a) and (aa) of Schedule 15.3 From: unknown To: 09-Apr-19	Four lights were assigned to an ICP which is not settled. Potential impact: Low Actual impact: Unknown Audit history: None Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as moderate, because almost all lights are assigned to a settled ICP. The impact is assessed to be low, the total wattage of the lights assigned to ICP 0000000000EAZZZ is 394W or 1682 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).

Actions taken to resolve the issue	Completion date	Remedial action status
The 4 lights that were assigned to an ICP that is not settled have now been assigned to the correct ICP	April 2019	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	

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 street addresses and pole numbers.

Most items of load have GPS coordinates recorded. Al items without GPS coordinates have road name, location number, displacement, road side, and pole number information which allows them to be located.

Audit outcome

Compliant

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

Code reference

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

Code related audit information

The DUML database must contain:

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

Audit observation

The database was checked to confirm that it contained a field for lamp type and wattage capacity and included any ballast or gear wattage.

Audit commentary

All items of load have a lamp model, lamp wattage and gear wattage populated. The accuracy of the recorded wattages is discussed in **section 3.1**.

Audit outcome

Compliant

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

Code reference

Clause 11(2A) of Schedule 15.3

Code related audit information

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

Audit observation

The field audit was undertaken of a statistical sample of 141 items of load on 7-9 April 2019.

Audit commentary

The following differences were identified during the field audit.

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
ADC					
AGNES STREET	6	6	-	6	One L55A and five L25A LEDs were recorded in the database as sodium lamps.

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
CARTERS TERRACE	11	9	-2	6	One 27w LED and one 70W SON in the database were not located in the field. One L55A and five L25A LEDs were recorded in the database as sodium lamps.
CRIDLAND STREET	6	6	-	6	Six L25A LEDs were recorded in the database as sodium lamps.
GRAHAM STREET	9	9	-	9	Nine L55A LEDs were recorded in the database as sodium lamps.
ISLEWORTH ROAD	4	4	-	3	Three L55A LEDs were recorded in the database as sodium lamps.
MACKIE STREET (RAKAIA)	5	5	-	5	Five L25A LEDs were recorded in the database as sodium lamps.
TURTON STREET	9	8	-1	-	One 27w LED was not located in the field.
Total	**166**	**163**	**3**	**35**	

The field audit did not identify any lights which were present in the field but not recorded in the database. Three lights were recorded in the database but not located in the field, and 35 wattage discrepancies were identified. These differences are recorded as non-compliance in **section 3.1**.

As reported in the last audit report, Methven festival lights and other festive lights are connected to the streetlight circuits when operating, but are not recorded in RAMM. The number and wattage of these lights is unknown but is expected to be minor. This is recorded as non-compliance in **section 2.1**, **3.1** and **3.2**.

Description	Recommendation	Audited party comment	Remedial action
Clause 11(2A) of Schedule 15.3 Festive lights	Confirm the wattages for festive and decorative lights, and update RAMM. Communicate on and off dates for festive and decorative lights to Meridian.	The council is in the process of identifying the lamps associated with the decorative and festive lighting so these can be added to the database.	Identified

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3 From: unknown To: 09-Apr-19	Festive and decorative lights are not recorded in the database. Potential impact: Low Actual impact: Low Audit history: None Controls: Weak Breach risk rating: 3
Audit risk rating	**Rationale for audit risk rating**
Low	Controls are rated as weak, because festive lights are currently excluded from the database. The impact is expected to be low, because only festive and decorative lights are affected.

Actions taken to resolve the issue	Completion date	Remedial action status
The council is in the process of identifying the lamps associated with the decorative and festive lighting so these can be added to the database.	Nov 2019	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	

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

On 20th September 2012 the Authority sent a memo to Retailers and auditors advising that tracking of load changes at a daily level was not required as long as the database contained an audit trail. I have interpreted this to mean that the production of a "snapshot" report is sufficient to achieve compliance. The database tracks additions and removals as required by this clause.

Database changes

Processes to track changes to the database were reviewed.

EA Networks are responsible for new connections, fault, maintenance and upgrade work, and maintain the database. ADC also works with EA Networks to complete some RAMM updates, particularly where new streetlight types are entered or bulk updates occur for LED upgrades.

For new subdivisions, the developer liaises with EA Networks to arrange a new connection. Streetlight design is approved by ADC on EA Networks' recommendation. EA Networks completes the connection once it is approved by ADC and EA Networks, and updates RAMM. As recommended in the last audit, a check is now completed to ensure that streetlight data is verified before RAMM is updated. ICP 0000000000EAXXX is used to track lights which are not yet livened, and once the lights become live they are moved to the correct ICP. This ICP is correctly excluded from submission data.

The LED upgrade project is well underway. As at 1 April 2019 1,659 lights had been upgraded, and 352 lights were still to be upgraded. RAMM is updated for LED upgrades by ADC when claim data is received. There have been two claims and subsequent bulk updates to date, with the last one on 21 March 2019. This process has led to some delays in database updates, which were evident in the field audit results discussed in **section 2.5**.

Outage patrols are completed by EA Networks as part of their maintenance agreement with ADC. Outages are also reported by residents within the ADC region and work orders are raised with EA Networks as required.

Private lights

EA Networks confirmed that there are a small number of private unmetered streetlights on their network. These are typically associated with another ICP. EA Networks does not have unmetered load recorded on the registry for the affected ICPs, and confirmed that retailers normally request confirmation of the unmetered load details when these ICPs switch.

Most of these ICPs are excluded from the database, but a small number are included the database and submissions:

Light ID	Road Name	Lamp Model	Lamp Wattage	Gear wattage	ICP
7941	ALLENS ROAD	Unknown 65w	65	0	0000025163EA218
7979	EAST STREET	Unknown 65w	65	0	0000025163EA218
7980	EAST STREET	Unknown 65w	65	0	0000025163EA218
7973	MCMURDO STREET	Unknown 65w	65	0	0000025163EA218
7977	THOMSON STREET	Unknown 65w	65	0	0000025163EA218

ADC confirmed that they are not responsible for the load associated with private lighting, and these private lights will be covered as part of EA Networks' distributor audit. These lights should be passed to EA Networks to create shared unmetered load or standard unmetered load as appropriate, and removed from the monthly wattage report once this is complete.

Recommendation	Description	Audited party comment	Remedial action
Clause 11(3) of Schedule 15.3 Tracking of load changes	I recommend the details of known private lights should be passed to EA Networks to create shared unmetered load or standard unmetered load as appropriate, and removed from the monthly wattage report once this is complete.	We will discuss this recommendation with the council and EA Networks	Investigating

Festive lights

Methven festival lights are connected to the streetlight circuits in Methven during winter and at Christmas time. Festive lights are occasionally connected in other locations, including East Street in Ashburton. These lights were not connected this year.

Methven festival lights and other festive lights are not recorded in RAMM. The number and wattage of these lights is unknown, but is expected to be low. This is recorded as non-compliance in **sections 2.1**, **2.5**, **3.1** and **3.2**. ADC intends to discuss processes for these lights with Meridian.

Audit outcome

Compliant

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

Code reference

Clause 11(4) of Schedule 15.3

Code related audit information

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

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

Audit observation

The database was checked for audit trails.

Audit commentary

The database has a complete audit trail.

Audit outcome

Compliant

3. ACCURACY OF DUML DATABASE

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

Code reference

Clause 15.2 and 15.37B(b)

Code related audit information

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

Audit observation

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	Streetlights in the Ashburton region
Strata	The database contains 3,076 items of load located in the Ashburton region owned by ADC. The management process is the same for all lights, and one stratum was created.
Area units	I created a pivot table of the roads in the stratum, and I used a random number generator in a spreadsheet to select a total of 24 sub-units making up 5% of the total database wattage.
Total items of load	141 items of load were checked.

Wattages for all items of load were checked against the published standardised wattage tables produced by the Electricity Authority, and the manufacturer's specifications.

Audit commentary

Database accuracy based on the field audit

A small number of differences were identified during the field audit. The individual discrepancies are discussed in **section 2.5**.

The field data was 73.9% of the database data for the sample checked. The statistical sampling tool reported with 95% confidence the precision of the sample was 23.8%, and the true load in the field will be between 57.7% to 89.9% of the load recorded in the database. The sample is not sufficiently precise due to the inaccuracies found in the field audit and indicates that the database is likely to be over recording wattages.

The tool indicated that there is potentially 217,900 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool) of over submission. The statistical sampling tool reported with 95% confidence the possible impact will be over submission of between 84,200 and 352,700 kWh per annum.

Most of the differences relate delays in recording LED upgrades, which has led to over submission. LED lights are updated in bulk when a claim is received, and the database may be updated well after the lamp has been upgraded. I note that the LED upgrade project is nearing completion and it is expected that once all these updates are processed accuracy will improve significantly with only minor changes being made going forward.

Wattage accuracy – comparison to specifications

The database was checked against the published standardised wattage table, and manufacturer's specifications where available.

I identified two lamps with gear wattage discrepancies, which were corrected to the expected values during the audit. The error resulted in over submission of 8W or 34 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).

Lamp Model	Quantity	Recorded gear wattage	Expected gear wattage	Difference (W)
SON 70w	1	14	13	-1
SON 70w	1	20	13	-7
Total				-8

Two other lamps had different gear wattages to the expected values, and ADC confirmed that the recorded values matched the suppliers data sheets:

Lamp Model	Quantity	Recorded gear wattage	Expected gear wattage
FL 18w	21	0	2
MV 125w	15	10	11

Wattage accuracy – private lights

As discussed in **section 2.6**, most private lights are not recorded in the database. Five private lights are recorded as unknown 65W with zero ballast wattages. ADC confirmed that they are not responsible for the load associated with private lighting, and these private lights will be covered as part of EA Networks' distributor audit. Inclusion of these private lights will result in over submission of 325W or 1388 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).

Wattage accuracy – festival and festive lights

Methven festival lights are connected to the streetlight circuits in Methven during winter and at Christmas time. Festive lights are occasionally connected in other locations, including East Street in Ashburton. These lights were not connected this year.

Methven festival lights and other festive lights are not recorded in RAMM. The number and wattage of these lights is unknown, but is expected to be low.

ICP accuracy

As discussed in **section 2.2**, four lights were assigned to an ICP which is not settled. The total wattage of the lights assigned to ICP 0000000000EAZZZ is 394W or 1682 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: unknown To: 09-Apr-19	The database contains some inaccurate data. The field data is 73.9% of the database data for the sample checked. This will result in potential over submission of 217,900 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool). Two lamps had incorrect gear wattages recorded, and were corrected during the audit. The error resulted in over submission of 8W or 34 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool). Five private lights which ADC is not responsible for were recorded in the database against ADC DUML ICP 0000025163EA218, resulting in over submission of 325W or 1388 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool). Festive and decorative lights are unmetered, but are not recorded in RAMM. Four lights were assigned to an ICP which is not settled, resulting in under submission of 394W or 1682 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool). Potential impact: High Actual impact: Unknown Audit history: None Controls: Weak Breach risk rating: 9
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as weak, because they are not sufficient to ensure that database wattage is accurate. The impact is assessed to be high based on the wattage differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
The LED upgrade program is now complete and all resulting changes to lamp information and wattages have been made in the database. As noted, this is expected to improve the accuracy of the database significantly as the majority of discrepancy found during the field audit were associated with upgraded lamps that had not been changed in the database. The council is in the process of identifying the lamps associated with the decorative and festive lighting so these can be added to the database. The 4 lights that were assigned to an ICP that is not settled have now been assigned to the correct ICP	May 2019 Nov 2019 April 2019	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	

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

Code reference

Clause 15.2 and 15.37B(c)

Code related audit information

The audit must verify that:

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

Audit observation

Submission data was checked for accuracy, including:

- 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

The process for calculation of consumption was examined.

Audit commentary

This clause requires that the distributed unmetered load database must satisfy the requirements of schedule 15.5 regarding the methodology for deriving submission information.

A monthly report from the database is provided to Meridian, and used to calculate submissions. Meridian submits the DUML load as NHH 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 EMS' agent audit.

The correct profile and submission type is recorded on the registry for all ICPs. The capacities supplied to EMS for April 2019 were checked and confirmed to be accurate.

Volume inaccuracy is present as follows:

Issue	Estimated volume information impact (annual kWh)
Potential over submission due to database inaccuracy identified during the field audit.	Potential over submission of 217,900 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).
Two lamps had incorrect gear wattages recorded, and were corrected during the audit.	Over submission of 8W or 34 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).
Five private lights which ADC is not responsible for were recorded in the database**.**	Over submission of 325W or 1388 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).
Festive and decorative lights are unmetered, but are not recorded in RAMM.	Unknown volume of under submission.
Four lights had ICP 0000000000EAZZZ assigned, which is used to track lights with unknown owners and is not settled.	Under submission of 394W or 1682 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 11(1) of Schedule 15.3 From: unknown To: 09-Apr-19	The database contains some inaccurate data. The field data is 73.9% of the database data for the sample checked. This will result in potential over submission of 217,900 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool). Two lamps had incorrect gear wattages recorded, and were corrected during the audit. The error resulted in over submission of 8W or 34 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool). Five private lights which ADC is not responsible for were recorded in the database against ADC DUML ICP 0000025163EA218, resulting in over submission of 325W or 1388 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool). Festive and decorative lights are unmetered, but are not recorded in RAMM. Four lights were assigned to an ICP which is not settled, resulting in under submission of 394W or 1682 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool). Potential impact: High Actual impact: Unknown Audit history: Once Controls: Weak Breach risk rating: 9
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as weak, because they are not sufficient to ensure that database wattage is accurate. The impact is assessed to be high based on the wattage differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
The LED upgrade program is now complete and all resulting changes to lamp information and wattages have been made in the database. As noted, this is expected to improve the accuracy of the database significantly as the majority of discrepancy found during the field audit were associated with upgraded lamps that had not been changed in the database.	May 2019	Identified
The council is in the process of identifying the lamps associated with the decorative and festive lighting so these can be added to the database.	Nov 2019	
The 4 lights that were assigned to an ICP that is not settled have now been assigned to the correct ICP	April 2019	
Preventative actions taken to ensure no further issues will occur	**Completion date**	

CONCLUSION

ADC's DUML ICPs switched from Trustpower to Meridian effective from 01/04/19. NZTA ICPs 0000033381EAF01 and 0000033382EA3C1 are included in the database, but are still supplied by Trustpower, so are excluded from the scope of the audit and subject to a separate audit.

A RAMM database is held by ADC, who is Meridian's customer. **Electricity Ashburton (EA Networks)** are responsible for new connections, fault, maintenance and upgrade work, and maintain the database. ADC also works with EA Networks to complete some RAMM updates, particularly where new streetlight types are entered or bulk updates occur for LED upgrades.

A monthly report from the database is provided to Meridian, and used to calculate submissions. Meridian submits the DUML load as NHH 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 EMS' agent audit.

Five non-compliances were identified, and two recommendations were raised. The future risk rating of 32 indicates that the next audit be completed in three months. Most of the non-compliance relates to timing differences for LED upgrades, which has led to over submission. LED lights are updated in bulk when a claim is received, and the database may be updated well after the lamp has been upgraded. I note that the LED upgrade project is nearing completion and it is expected that once all these updates are processed accuracy will improve significantly. Based on this, and the comments received, I recommend the next audit be completed in nine months to allow time to update records for the upgraded lights and resolve the other non-compliances.

PARTICIPANT RESPONSE

Meridian has reviewed this report, and their comments are contained within its body.