VERITEK

Electricity Industry Participation Code Audit Report

For

Meridian Energy Limited

meridian

Waterloo Park lights
Distributed Unmetered Load

Prepared by Rebecca Elliot – Veritek Ltd

Date of Audit: 06/11/17

Date Audit Report Complete: 13/04/18

Executive Summary

This audit of the Waterloo Park streetlight 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, which became effective on 1 June 2017.

The lights covered by this audit are located in Waterloo Park which is a recent industrial park in Islington, Christchurch. The database is managed by Orion. The streetlight data is held in Orion's GIS and an SQL database, which interfaces with the GIS.

This audit found three non-compliances and makes no recommendations. A full field audit was undertaken of all 53 items of load. The non-compliances relate to a small variance between the kW figure used by Meridian and the database extract and the field audit found five wattage variances resulting in a 92.9% database accuracy. These variances combined is resulting in an estimated minor over submission of 2,024kWh.

Based on the next audit frequency table the next audit of this database should be completed in 18 months and I agree with this recommendation. The matters raised are detailed below:

Table of Non-Compliance

Subject	Section	Clause	Non-compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Deriving submissions	2.1	11(1) of Schedule 15.3	A difference in the kW figures between the database and the figure recorded by Meridian of 0.274kW resulting in an estimated over submission of 1,170kWh per annum. Database accuracy of 92.9% indicating over submission of 854 kWh per annum. A combined estimated annual over submission of 2,024kWh.	Moderate	Low	2	Identified
Database accuracy	3.1	15.2 & 15.37(b)	Accuracy ratio is 92.9% indicating over submission of 854 kWh per annum.	Moderate	Low	2	Identified

Subject	Section	Clause	Non-compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Volume information accuracy	3.2	15.2 & 15.37(c)	A difference in the kW figures between the database and the figure recorded by Meridian of 0.274kW resulting in an estimated over submission of 1,170kWh per annum. Database accuracy of 92.9% indicating over submission of 854 kWh per annum. A combined estimated annual over submission of 2,024kWh.	Moderate	Low	2	Identified
Future Risk Rating						6	

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

Table of Recommendations

Subject	Section	Recommendation	Description
		Nil	

Persons Involved in This Audit:

Auditor:

Rebecca Elliot
Veritek Limited
Electricity Authority Approved Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Amy Cooper	Compliance Officer	Meridian
Helen Youngman	Energy Data Analyst	Meridian
Penny Lawrence	Operations Services Co-ordinator	Orion

Contents

1. Administrative

1.1 List of ICPs

The following ICP is relevant to the scope of this audit:

ICP	Description	NSP	No. of items of load
0007174608RN59A	Waterloo Business Park Street Lighting ICP	ISL0331	53

1.2 Exemptions from Obligations to Comply with Code (Section 11 of Electricity Industry Act 2010)

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.

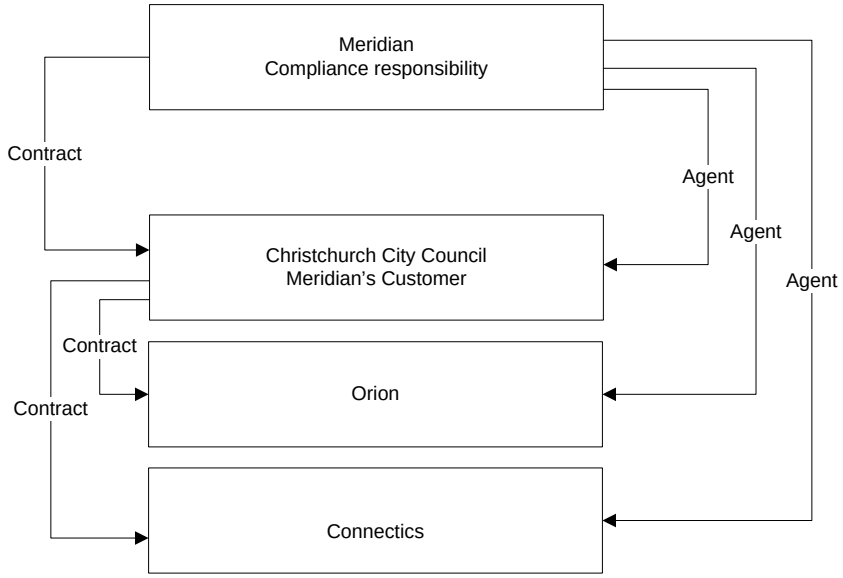
Meridian confirms there are no exemptions in place relevant to the scope of this audit.

1.3 Supplier List

Orion and Connetics are considered agents and Meridian understands that the use of agents does not release them from their compliance obligations.

The relationship between Meridian and the agents is complicated by the fact that the contractual relationship exists between Meridian and Christchurch City Council and Christchurch City Council and Orion and Connetics. There is no direct contractual relationship between Meridian and Orion or Connetics.

The diagram below shows the relationships from a compliance and contractual perspective.



1.4 Hardware and Software

Section 1.9 shows that the streetlight data is held in Orion's GIS and an SQL database.

Both systems are backed up in accordance with standard industry procedures. Access to the GIS and 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 Distributed Unmetered Load Audits (Clauses 16A.26 & 17.295F)

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 has 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

1.7 Separate Distributed Unmetered Load Audit (Clause 16A.8(4))

Retailers must ensure that DUML audits are reported in a separate audit report.

Audit Observation

Meridian has requested Veritek to undertake this streetlight audit.

Audit Commentary

The audit report for this DUML load is separate from other audit reports.

Audit outcome
Compliant

1.8 Summary of Previous Audit

Meridian provided a copy of the previous audit report for this DUML load, conducted in 2016 by Steve Woods of Veritek Limited. Compliance was recorded in relation to this DUML load.

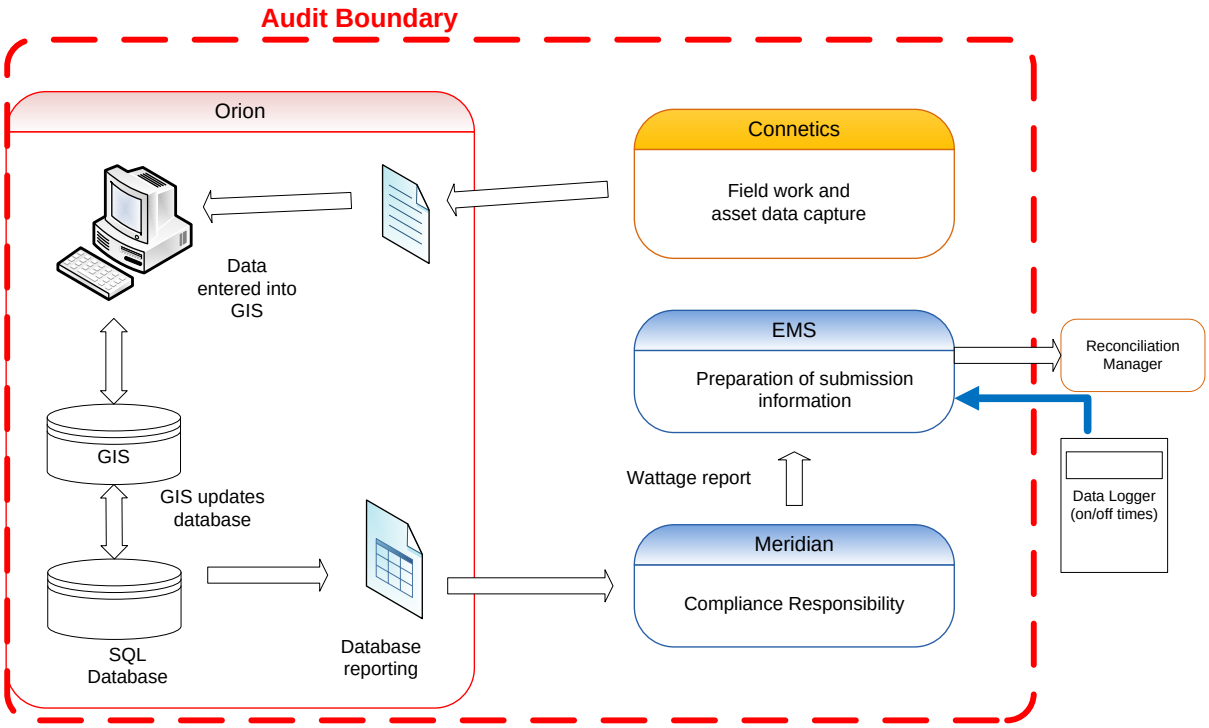
1.9 Scope of Audit

This audit of the Waterloo Park streetlight 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, which became effective on 1 June 2017.

The lights covered by this audit are located in Waterloo Park which is a recent industrial park in Islington, Christchurch. The database is managed by Orion. The streetlight data is held in Orion's GIS and an SQL database, which interfaces with the GIS.

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 audit was carried out at on 08/11/17. The field audit was undertaken of all 53 lights. They are all streetlights and therefore treated as one population group.

1.10 Data Transmission (Clause 20 of Schedule 15.2)

Orion sends a password protected excel spreadsheet to Meridian each month.

Audit outcome
Compliant

2. DUML database requirements

2.1 Deriving Submission Information (Clause 11(1) of Schedule 15.3)

The retailer must ensure the:
• DUML database is up to date
• methodology for deriving submission information complies with Schedule 15.5.

Audit Observation

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

Audit Commentary

Meridian reconciles this DUML load using the DST profile. The on and off times are derived from a data logger read by EMS. 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 was audited during Meridian's reconciliation participant audit, and compliance was confirmed.

I checked the submission for the month of November 2017 and found that the load recorded by Meridian was 0.274 kW higher than the light values recorded in the Orion database. This will be resulting in an estimated over submission of 1,170 kWh per annum (based on an annual burn hours figure of 4,271 as is detailed in the DUML database auditing tool).

As discussed in **section 3.1**, analysis of the field audit results indicated a database accuracy of 92.9% due to five incorrect wattages found in the field. This will result in a minor estimated over submission of 854 kWh per annum.

The submission discrepancies are also recorded as non-compliance in **sections 3.1** and **3.2.**

Audit outcome
Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: 11(1) of Schedule 15.3 From: entire audit period	A difference in the kW figures between the database and the figure recorded by Meridian of 0.274kW resulting in an estimated over submission of 1,170kWh per annum. Database accuracy of 92.9% indicating over submission of 854 kWh per annum. A combined estimated annual over submission of 2,024kWh. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	Controls are rated as moderate, as they are sufficient to mitigate the risk most of the time but there is room for improvement. The combined variance of an estimated 2,024kWh annual over submission, is considered minor therefore the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
Meridian has investigated the differences in kW figures reported and concludes that the difference of .0274 kW was caused by a timing difference between the database extract used for the audit analysis (early Nov) and the report used by Meridian to calculate settlement volumes for Nov 17 (30 Nov). Orion has confirmed that lights were connected and added to the database during the month of November which as reported in section 2.6 take effect from the beginning of the month.	March 2018	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	

2.2 ICP Identifier (Clause 11(2)(a) of Schedule 15.3)

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 that the ICP was recorded against each item of load.

Audit Commentary

The database contains the relevant ICP identifiers.

Audit outcome
Compliant

2.3 Location of Each Item of Load (Clause 11(2)(b) of Schedule 15.3)

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. This can also include GPS co-ordinates.

Audit Commentary

The streetlight data is held in Orion's GIS and an SQL database. GIS records the geographical location of each item of load. The database contains the street name and number of each item of load. Outage patrols are regularly conducted by Connetics. They notify Orion of any differences found. Orion then updates the GIS and database accordingly.

Audit outcome

Compliant

2.4 Description of Load Type (Clause 11(2)(c) & (d) of Schedule 15.3)

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, that any ballast or gear wattage has been applied correctly, and that it aligns with the published standardised wattage table produced by the Electricity Authority.

Audit Commentary

The assigned lamp ID for each item of load references to a wattage table that contains a total wattage. All of these lights are LED so there is no gear wattage to be added and all items of load had a light type and lamp wattage recorded.

Audit outcome

Compliant

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

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

Audit Observation

The field audit was undertaken of all 53 lights.

Audit Commentary

The field audit confirmed the correct number of lights. Five incorrect wattages were found recorded in the database. These are recorded as non-compliance in **sections 2.1, 3.1** and **3.2**. The findings are detailed in the table below:

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
Innovation Rd	12	12	-	5	5 lamps recorded in the database as 98W LED were 58W LEDs
Enterprise Ave	17	17	-	-	
Islington Ave	18	18	-	-	
Industry Ave	6	6	-	-	
Total	53	53	-	5	

Audit outcome

Compliant

2.6 Tracking of Load Changes (Clause 11(3) of Schedule 15.3)

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 was examined.

Audit Commentary

Any changes that are made during any given month take effect from the beginning of that month. The information is available which would allow for the total load in kW to be retrospectively derived for any day. On September 20th 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 monthly "snapshot" report is sufficient to achieve compliance.

For new connections or upgrades, Orion receives notification from Waterloo Park. The process is well defined and requires paperwork to be completed before each job can progress to next stage. Once accepted an “as built” is provided. The database is updated only once all paperwork is returned and completion is confirmed. The update occurs on the same day received. Any new additions are captured in the next billing cycle, which is taken at the end of the month for the month prior. Therefore, all new lights are captured each month regardless of when they were actually livened. Field checks are regularly conducted when changes are made to ensure database accuracy. The small number of incorrect wattages recorded above were due to the incorrect wattage being recorded on the “as built”, and not because Orion’s process is weak.

Audit outcome
Compliant

2.7 Audit Trail (Clause 11(4) of Schedule 15.3)

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

Any changes made in the database are tracked according to this clause.

Audit outcome
Compliant

3. Accuracy of DUML database

3.1 Database Accuracy (Clause 15.2 & 15.37(b))

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

Audit Observation

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

- checking the registry to confirm that the ICP has the correct profile and submission flag
- 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.

The entire database was audited, and database accuracy is estimated to be 92.9%, based on the recorded database load of 2.82 kW compared to actual load of 2.62 kW (200W difference due to the five incorrect lamp wattages detailed in **section 2.5)**. This will result in an estimated minor over submission of 854 kWh per annum.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: 15.2 & 15.37(b) From: entire audit period	Accuracy ratio is 92.9% indicating over submission of 854 kWh per annum. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	Controls are rated as moderate, as they are sufficient to mitigate the risk most of the time but there is room for improvement. The variance of an estimated 854kWh annual over submission, is considered minor therefore the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
The 5 incorrect wattages identified have been corrected in the database.	March 2018	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Existing controls are considered adequate to mitigate the risk most of the time.	Ongoing	

3.2 Volume Information Accuracy (Clause 15.2 & 15.37(c))

The audit must verify that:
• volume information for the DUML is being calculated accurately
• profiles for DUML have been correctly applied.

Audit Observation

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

- checking the registry to confirm that the ICP has the correct profile and submission flag
- 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 checked the submission for the month of November 2017 and found that the load recorded by Meridian was 0.274 kW higher than the light values recorded in the Orion database. This will be resulting in an estimated over submission of 1,170 kWh per annum (based on an annual burn hours figure of 4,271 as is detailed in the DUML database auditing tool).

The DUML database auditing tool provided a result indicating the field data was 92.9% of the database data. This will result in an estimated minor over submission of 854 kWh per annum.

Audit outcome
Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: 15.2 & 15.37(c) From: entire audit period	A difference in the kW figures between the database and the figure recorded by Meridian of 0.274kW resulting in an estimated over submission of 1,170kWh per annum. Database accuracy of 92.9% indicating over submission of 854 kWh per annum. A combined estimated annual over submission of 2,024kWh. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	Controls are rated as moderate, as they are sufficient to mitigate the risk most of the time but there is room for improvement. The combined variance of an estimated 2,024kWh annual over submission, is considered minor therefore the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
Refer comments in section 2.1 and 3.1 regarding these issues		Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	

4. Conclusions

This audit found three non-compliances and makes no recommendation. A full field audit was undertaken of all 53 items of load. The non-compliances relate to a small variance between the kW figure used by Meridian and the database extract and the field audit found five wattage variances resulting in a 92.9% database accuracy. These variances combined are resulting in an estimated minor over submission of 2,024kWh.

Based on the next audit frequency table the next audit of this database should be completed in 18 months.

5. Meridian Comments

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