

VERITEK

Electricity Industry Participation Code Audit Report

For

Trustpower Limited



**Ashburton District Council
Distributed Unmetered Load**

Prepared by Rebecca Elliot – Veritek Ltd

Date of Audit: 06/10/17

Date Audit Report Complete: 23/03/18

Executive Summary

This audit of the Ashburton District Council (ADC) DUML database and processes was conducted at the request of Trustpower Limited (Trustpower), 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.

ADC is located on the Electricity Ashburton network. Electricity Ashburton is engaged as the streetlighting maintenance contractor. ADC maintains the RAMM database and reporting from this is used by Trustpower to calculate submission information.

ADC have good processes in place for the management of the street light database. The audit identified 625 items of load with the incorrect ballast applied. 586 of these relate to one lamp type with a minor difference of 2 watts and therefore this should be easy to remedy. This results in an estimated under submission of 5,901 kWh per annum.

The field audit of 334 items of load found five differences, resulting in the survey wattage being 0.21% higher than the database wattage. This results in an estimated under submission of 3,178 kWh per annum.

The future risk rating of ten indicates that the next audit be completed in 12 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 submission	2.1	11(1) of Schedule 15.3	<p>Under submission of 15.04 kWh per month due to the rounding of the unmetered load kW figure to the nearest whole number</p> <p>Accuracy ratio is 100.21% indicating under submission of 3,178 kWh per annum.</p> <p>625 items of load with the incorrect ballast applied indicating under submission of 5,901 kWh per annum.</p> <p>Combined value of 9,079 kWh under submitted per annum</p>	Moderate	Low	2	Identified

Subject	Section	Clause	Non-compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Recording of all load	2.5	11(2A) of Schedule 15.3	2 lights not found in the field.	Moderate	Low	2	Identified
Tracking of load change	2.6	11(3) of Schedule 15.3	Methven festival lights are not included in reporting to Trustpower	Moderate	Low	2	Investigating
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.	Moderate	Low	2	Investigating
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	Moderate	Low	2	Identified
Future Risk Rating						10	
Indicative Audit Frequency						12 months	

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
Data transmission	1.10	20 of schedule 15.2	Add password protection to the monthly report.
Tracking of load change	2.6	11(3) of schedule 15.3	Field check that the light type provided in the as built is what is installed in the field.

Persons Involved in This Audit:

Auditor:

Rebecca Elliot
Veritek Limited
Electricity Authority Approved Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Barry Harkerss	Account Manager	Trustpower
Deborah Barron	Asset Manager Officer Roading	Ashburton District Council
Wayne Watson	Projects Manager	Electricity Ashburton

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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
0000010559EAD7C	Ashburton District Council – Streetlighting	ASB0331	27
0000025163EA218	Ashburton District Council – Streetlighting	ASB0331	2,856
0000025164EAFD2	Open Spaces - Parks and Amenities	ASB0331	94
0000030218EA553	Methven	ASB0661	27
0000033381EAF01	NZTA Methven	ASB0331	55
0000033382EA3C1	NZTA not Methven	ASB0331	299
TOTAL items of load			3,358

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.

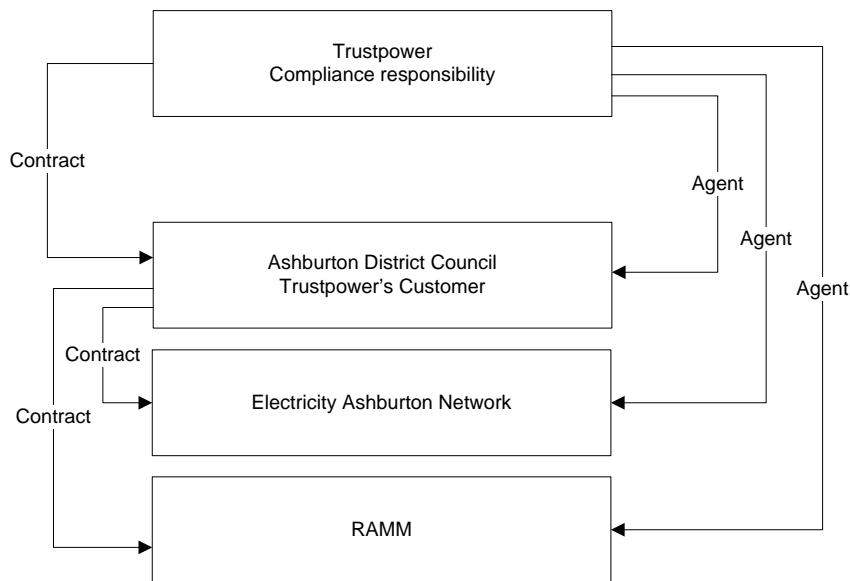
Trustpower confirms there are no exemptions in place relevant to the scope of this audit:

1.3 Supplier List

Ashburton DC, Electricity Ashburton and RAMM are considered agents under this clause, and Trustpower clearly understands that the use of agents does not release them from their compliance obligations.

A contractual relationship exists between Trustpower and Ashburton DC as part of the sales contract, however there is no direct contractual relationship between Trustpower and Electricity Ashburton and RAMM for the provision of services in relation to DUML. This is not seen as an issue, if the processes for updating the database are robust and have appropriate validation controls in place.

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



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”.

Ashburton DC confirmed that the database back-up is in accordance with standard industry procedures. The database is password protected.

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

Trustpower 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. Compliance is confirmed.

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

Trustpower has requested Veritek to undertake this streetlight audit.

Audit Commentary

The audit report for this DUML database is separate from other audit reports. Compliance is confirmed.

1.8 Summary of Previous Audit

Trustpower provided a copy of the last audit report undertaken by Steve Woods of Veritek in 2014. The findings from that audit are set out below with the current statuses.

Table of Non-Compliance

Subject	Section	Clause	Non compliance	Status
ICP identifiers	2.2.1 now 2.2	11(2)(a) of schedule 15.3	EA spreadsheet does not record ICP identifiers.	Cleared
Capacities	2.2.4 now 2.4	11(2)(d) of schedule 15.3	Wattage figures not correct for 5 lamps. Wattage figures not correct for 5 of lamps. Lamp wattage not populated for 766 records in ADC database.	Still existing
Audit trail	2.4 now 2.7	11(4) of schedule 15.3	EA spreadsheet does not contain an audit trail.	Cleared

Table of Recommendations

Subject	Section	Clause	Recommendation for improvement	Status
Data transmission	1.9	20 of schedule 15.2	Transmit monthly reports in a secure manner when reporting from ADC commences.	Still existing
Tracking of load changes	2.3	11(3) of schedule 15.3	Check database accuracy for new developments. Conduct a complete field audit of all lamps.	Still existing Cleared

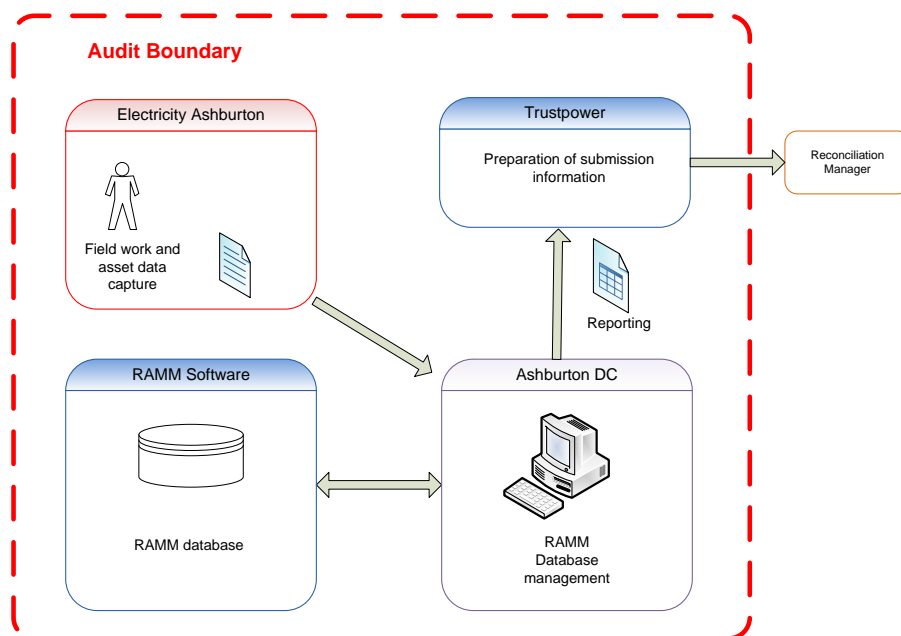
1.9 Scope of Audit

This audit of the Ashburton District Council (ADC) DUML database and processes was conducted at the request of Trustpower Limited (Trustpower), 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.

ADC is located on the Electricity Ashburton network. Electricity Ashburton is engaged as the streetlighting maintenance contractor and ADC maintain the RAMM database, which is used by Trustpower to calculate submission information. ADC provides reporting to Trustpower on a monthly basis.

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 ADC 's premises on 06/10/17. The field audit was undertaken of 334 lights using the statistical sampling methodology. The field selection included four population groups:

- Urban
- Rural
- NZTA
- New lights.

1.10 Data Transmission (Clause 20 of Schedule 15.2)

A report is sent to Trustpower monthly from ADC. This is not password protected. I recommend a password is added.

Recommendation	Description	Audited party comment	Remedial action
Regarding: Clause 20 of schedule 15.2	Add password protection to the monthly report.	Discussed with ADC who believe the security inherent within their, and Trustpower's, email and internet software and information systems meets the requirement of this clause. Password-protected documents introduce issues of their own, where the password must either be remembered or recorded (in itself a security problem) by all users. Change of roles and/or staff can easily render passwords forgotten or lost. This recommendation is declined at this stage	Declined

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.

Audit Commentary

Trustpower reconciles this DUML load using the STL profile. Trustpower derives the hours of operation information using a data logger. I checked the submission figures for the month of September 2017 and found a variance between the calculated kWh figure and the figures submitted. The combined impact of this was an under submission of 15.04 kWh for the month of August. This is due to GTV rounding the unmetered figure to the nearest full number. Trustpower have put a fix in place for this so all streetlight ICPs will round to three decimal places and this will be washed through the revision process.

As detailed in **section 3.1**, the DUML database auditing tool provided a result indicating the field data was 100.21% of the database data. This will result in estimated under submission by 3,178 kWh per annum. Analysis of the ADC identified 625 items of load with the incorrect ballast applied. The incorrect capacities would result in an estimated under submission of 5,900.98 kWh per annum (based on 11.5 hours burn hours for 365 days).

The combined estimated under submission for ADC is 9,079 kWh per annum.

This is recorded as non-compliance below.

Non-compliance	Description		
Audit Ref: 2.1 With: 11(1) of Schedule 15.3 From: entire audit period	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. 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 9,079 kWh under submitted is considered minor therefore the audit risk rating is low.		
Actions taken to resolve the issue		Completion date	Remedial action status
A fix has been put in place to correct the upload file from rounding to the nearest whole number. Data has been backdated for the 14 month washup cycle. ADC are working with Electricity Ashburton to update ballasts in the database to match the EA standards		13/03/18 31/03/18	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
ADC will run an internal annual audit on the RAMM data comparing listed ballasts with the EA recommendations. Discrepancies will be discussed with Electricity Ashburton and corrected as required.		Ongoing	

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 the correct ICP was recorded against each item of load.

Audit Commentary

The analysis found that all items of load had the correct ICP recorded against them. Compliance is confirmed.

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.

Audit Commentary

The database contains Global Positioning System (GPS) coordinates for 3,336 (99.34%) of the 3,358 lamps. Street address information is recorded for all lamps. Compliance is confirmed.

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, and included any ballast or gear wattage.

Audit Commentary

The database contains a field for lamp type and this is populated appropriately. The database contains three fields for wattage, firstly the manufacturers rated wattage, secondly the gear wattage and the third contains the total wattage. All items of load had this detail populated. Compliance is confirmed.

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 213 lights using the statistical sampling methodology.

Audit Commentary

The field audit findings are detailed in the table below and found a small number of discrepancies.

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
ADC Urban					
ALTON PLACE	3	3	-	-	
DAVIS CRESCENT	13	13	-	-	
KING STREET	7	7	-	-	
MILLER STREET	9	9	-	-	
OAK GROVE EAST	15	15	-	-	
ORCHARD GROVE	4	4	-	-	
PRINCES STREET	23	23	-	-	
WALSHS STREET	5	5	-	-	
WOODHAM DRIVE	5	5	-	-	
ALLENS ROAD	23	23	-	-	
BELT ROAD	20	20	-	-	
TUCKER STREET	10	10	-	-	
TURTON STREET	9	9	-	-	
ADC New					
BRAEBROOK DRIVE	16	16			
PRIMROSE PLACE	4	4	-	-	
DOUGLAS DRIVE	8	8	-	-	
HANRAHAN STREET	18	18	-	-	
CHARLESWORTH DRIVE	17	17	-	-	
AYERS GREEN	5	5	-	-	
ADC- Rural					
ALFORD PLACE	2	2	-	-	
CAWTON GROVE	4	5	+1		1 additional light found in field 35m from end of road
HAKATERE DRIVE EXT	3	3	-	-	
JAMES STREET (HINDS)	4	2	-2		2 lights not found in the field
PATON STREET	3	3	-	-	
RACECOURSE AVENUE	11	11	-	-	
REED STREET	8	8	-	-	
THOMSON STREET	27	27	-	-	
TRENT PLACE	1	2	+1		1 additional light found in the field but may be plotted inaccurately in RAMM
NZTA					
SH1 CHERTSEY TO ASHBURTON	10	11	+1		1 additional light found in field
SH1 ASHBURTON TO HINDS	35	35	-	-	
SH1 ASHBURTON TO RANGITATA	12	12	-	-	
Total	334	335	5		

Compliance is not achieved.

Non-compliance	Description		
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3 From: Entire audit period	2 lights not found in the field. 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. Overall the database accuracy was high hence the audit risk rating of low.		
Actions taken to resolve the issue		Completion date	Remedial action status
ADC have undertaken to investigate discrepancies and update where required		31/03/18	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
ADC are undertaking audits and improving maintenance to capture discrepancies		Ongoing	

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 in the database 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 20 September 2012, the Authority sent a memo to Retailers and auditors advising that tracking of load changes at a daily level was not required if 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.

As changes occur Electricity Ashburton provides the information to ADC, and this information is then entered into the database. The database is checked for accuracy as part of the lamp replacement process.

For new subdivisions, of which there are few, the lighting information is provided by the developer to ADC as part of the vesting process. They are added to RAMM prior to livening and will not be livened until the Council has given their approval. It is at this point that they are added to the monthly reporting

to Trustpower. ADC accept that the as built is what is installed in the field. I recommend that a check in the field is added to confirm that this is correct.

Recommendation	Description	Audited party comment	Remedial action
Regarding: Clause 11(3) of schedule 15.3	Field check that the light type provided in the as built is what is installed in the field.	Vested Streetlight data will be sent to Electricity Ashburton for verification before loading into RAMM as part of ADC's vesting procedures.	Identified

Festival lights were discussed and there are some used in the Methven area but these are not being included in the reporting to Trustpower. This is recorded as non-compliance below.

Non-compliance	Description		
Audit Ref: 2.6 With: Clause 11(3) of Schedule 15.3 From: Entire audit period	Methven festival lights not included in reporting to Trustpower. 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 volume associated with the festival lights is minor and therefore the audit risk rating of low.		
Actions taken to resolve the issue		Completion date	Remedial action status
Vested Streetlight data will be sent to Electricity Ashburton for verification before loading into RAMM as part of ADC's vesting procedures. ADC are investigating the festival lights to confirm if they are metered or unmetered, if they are the Council's lights or belong to other non-council groups and when they are in use (Winter Festival and Holiday season). Once this is determined processes will be put in place to include these lights in the database where needed.		As data is received	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	
Included in ADC Vesting procedures.		Ongoing	

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

ADC demonstrated a complete audit trail of all additions and changes to the database information. Compliance is confirmed.

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

Plan Item	Comments
Area of interest	Ashburton DC region
Strata	<p>The database contains items of load in Ashburton and included the NZTA lighting in the area.</p> <p>The area has three distinct sub regions of Ashburton urban, Ashburton rural, new lights and NZTA.</p> <p>The processes for the management of Ashburton DC items of load are the same, but I decided to place the items of load into three strata, as follows:</p> <ol style="list-style-type: none">1. ADC urban2. ADC urban3. ADC new4. NZTA
Area units	I created a pivot table of the roads in each area and I used a random number generator in a spreadsheet to select a total of 32 subunits (roads)
Total items of load	334 items of load were checked.

The database was examined for light wattage and ballast accuracy.

Audit Commentary

The DUMML database auditing tool provided a result indicating the field data was 100.21% of the database data. This will result in estimated under submission by 3,178 kWh per annum.

I checked the ballasts being applied and found a small number of discrepancies when compared to the standardised wattage table. These are detailed in the table below:

Lamp Type	RAMM Total Wattage	EA Standardised Wattage	Variance	Database Quantity	Estimated Annual effect on kWh consumption
Philips Cosmos 60W	71	66	5	20	419.7
100W HPS SON	112	114	2	586	4,918.88
250W HPS SON	260	278	10	15	629.55
400W HPS SON	442	438	-4	4	-67.15
Total estimated annual effect on submission					5,900.98

Analysis of the ADC identified 625 items of load with the incorrect ballast applied. The incorrect capacities would result in an estimated under submission of 5,901 kWh per annum (based on 11.5 hours burn hours for 365 days).

The combined estimated under submission for ADC is 9,079 kWh per annum.

This is recorded as non-compliance below.

Non-compliance	Description		
Audit Ref: 3.1 With: 15.2 & 15.37(b) From: entire audit period	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. 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 9,079 kWh under submitted is considered minor therefore the audit risk rating is low.		
Actions taken to resolve the issue		Completion date	Remedial action status
ADC have undertaken to investigate discrepancies and update where required		31/03/18	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	
Included in ADC Vesting procedures.		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

I compared the total submission to the reconciliation manager for each ICP to a manual calculation based on the database information provided, and burn hours. Trustpower reconciles this DUML load using the STL profile. Trustpower derives the hours of operation information using a data logger. I checked the submission figures for the month of September 2017 and found a variance between the calculated kWh figure and the figures submitted. The combined impact of this was an under submission of 15.04 kWh for the month of August. This is due to GTV rounding the unmetered figure to the nearest

full number. Trustpower have put a fix in place for this so all streetlight ICPs will round to three decimal places and this will be washed through the revision process.

As detailed in **sections 3.1**, the DUML database auditing tool provided a result indicating the field data was 100.21% of the database data. This will result in estimated under submission by 3,178 kWh per annum. Analysis of the ADC identified 625 items of load with the incorrect ballast applied. The incorrect capacities would result in an estimated under submission of 5,900.98 kWh per annum (based on 11.5 hours burn hours for 365 days).

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Preventative actions taken to ensure no further issues will occur		Completion date	
ADC will run an internal annual audit on the RAMM data comparing listed ballasts with the EA recommendations. Discrepancies will be discussed with Electricity Ashburton and corrected as required.		Ongoing	

4. Conclusions

ADC have good processes in place for the management of the street light database. The audit identified 625 items of load with the incorrect ballast applied. 586 of these relate to one lamp type with a minor difference of 2 watts and therefore this should be easy to remedy. This results in an estimated under submission of 5,900.98 kWh per annum.

The field audit of 334 items of load found five differences, resulting in the survey wattage being 0.21% higher than the database wattage. This results in an estimated under submission of 3,178 kWh per annum.

The future risk rating of eight indicates that the next audit be completed in 12 months and I agree with this recommendation.

5. Trustpower Comments

Trustpower has reviewed this report and their comments are recorded within it. No further comments were provided.