ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

For

TAUPO DISTRICT COUNCIL
AND TRUSTPOWER

Prepared by: Rebecca Elliot

Date audit commenced: 13 November 2018

Date audit report completed: 26 November 2018

Audit report due date: 1 December 2018

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EXECUTIVE SUMMARY

This audit of the Taupo District Council (TDC) DUML database and processes was conducted at the request of Trustpower (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.

TDC use a RAMM database to manage this DUML load. New connection, fault and maintenance work is completed by Downer. Monthly reports are received by Trustpower.

TDC have undertaken a review of the RAMM database management processes and strengthened them as a result. They have commenced an LED roll out and this is expected to be complete by June 2019. They are working with RAMM to upload the correct ballasts to the database, but at the time of this audit these are being added outside of the database. Overall the database accuracy is improving.

As was found in the last audit, from analysis of the volumes submitted by Trustpower and the database extract it appears that the data is being updated outside of the RAMM database. If the raw database data is correct this will be resulting in an estimated over submission of 131,074 kWh annually. I cannot confirm which is correct.

The audit found six non-compliances and makes two recommendations. The future risk rating of 26 indicates that the next audit be completed in three months, but I recommend that the next audit be due in six months. This should give sufficient time to correct the database and check that the submission values match to the database and that corrections have been made. Six non-compliances were identified, and two recommendations were made. 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 variance between the database extract and the monthly report used by Trustpower for submission is potentially resulting in an estimated over submission of 131,074 kWh per annum, if the database is correct. The September wattage report has been applied to the month of October and will not be replaced through the revision process. Incorrect ballasts recorded in RAMM. ICP not recorded against 32 items of load in the database resulting in an estimated 14,179 kWh of under submission per annum.	Moderate	High	6	Identified
ICP Identifier	2.2	11(2)(a) and (aa) of Schedule 15.3	ICP not recorded against 40 items of load in the database resulting in an estimated 14,179 kWh of under submission per annum.	Moderate	Medium	4	Identified
Description and capacity of each item of load	2.4	11(2)(c) of Schedule 15.3	230 items of load with incomplete lamp details.	Moderate	Low	2	Identified
All load recorded in the database	2.5	11(2A) of Schedule 15.3	All load is not recorded in the database.	Moderate	Low	2	Identified

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Database accuracy	3.1	15.2 and 15.37B(b)	230 items of load with incomplete lamp details. Incorrect ballasts recorded in RAMM.	Moderate	High	6	Identified
Volume information accuracy	3.2	15.2 and 15.37B(c)	The variance between the database extract and the monthly report used by Trustpower for submission is potentially resulting in an estimated over submission of 131,074 kWh per annum, if the database is correct. The September wattage report has been applied to the month of October and will not be replaced through the revision process. Incorrect ballasts recorded in RAMM. ICP not recorded against 32 items of load in the database resulting in an estimated 14,179 kWh of under submission per annum.	Moderate	High	6	Identified
Future Risk Rating						26	

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	Remedial outcome
ICP Identifier	2.2	Liaise with RAMM to utilise the "not connected" indicator available in RAMM.	TDC will investigate and Trustpower will work closely with the TDC to ensure that database is accurate over the next three months.
Tracking of load change	2.6	Liaise with the networks to confirm process understanding of new streetlight circuit.	Trustpower and TDC liaise with the Unison and the Lines Company to ensure that the process is well mapped between the parties.

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

Trustpower provided a copy of their organisational structure.

1.3. Persons involved in this audit

Auditor:

Rebecca Elliot

Veritek Limited

Electricity Authority Approved Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Alan Miller	Corporate Account Manager	Trustpower
Robbie Diederen	Reconciliation Analyst	Trustpower
Linda Cameron	Asset Information Manager	Taupo District Council
Pip Cameron	Asset Information Officer	Taupo District Council

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". The specific module used for DUML is called RAMM Contractor.

The 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

ICP Number	Description	NSP	Profile	Number of items of load	Database wattage (watts)
0000029279HR82A	Atiamuri Streetlights	ROT0111	STL	34	2,788
0000031514WEC89	Wharewaka Streetlights	WRK0331	STL	64	5,420
0001264720UN608	Taupo Streetlights	WRK0331	STL	3,228	280,183
0008807420WM161	Turangi Streetlights	TKU0331	STL	829	72,908
0008808341WM4B6	Mangakino Streetlights	HTI0331	STL	226	19,324
Total				4,381	380,622

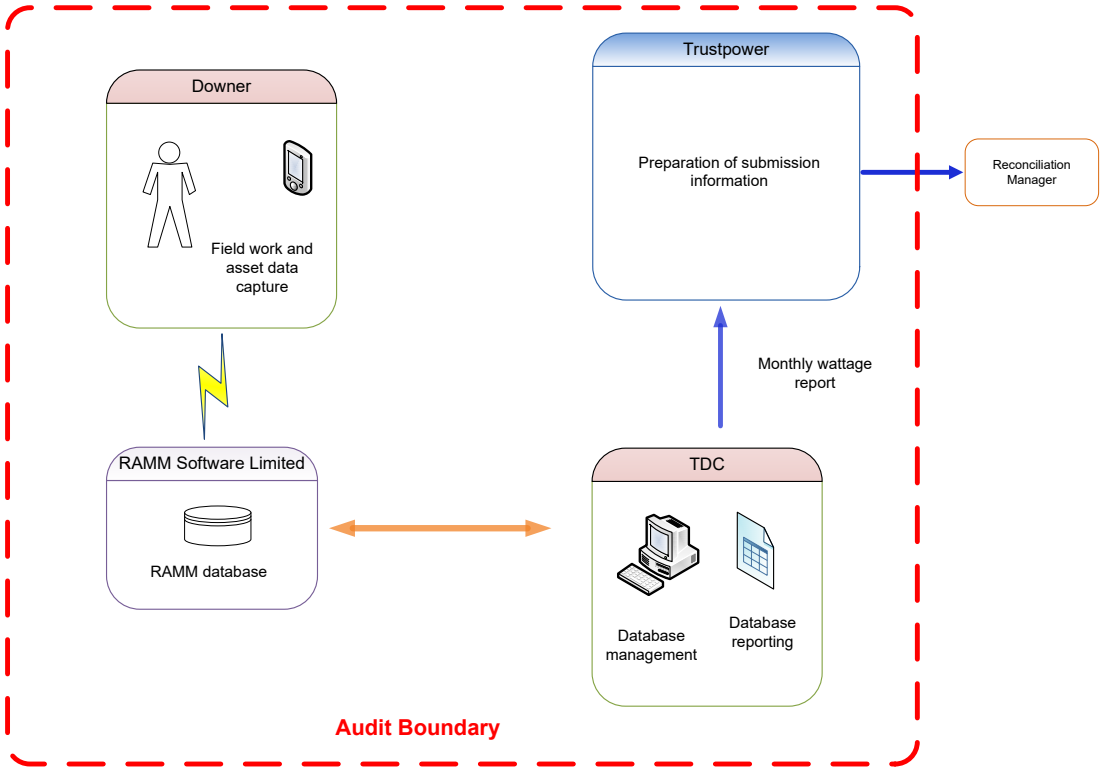
1.7. Authorisation Received

All information was provided directly by Trustpower and TDC.

1.8. Scope of Audit

TDC use a RAMM database to manage this DUML load. New connection, fault and maintenance work is completed by Downer. Monthly reports are received by Trustpower.

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.



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

The field audit was undertaken of a statistical sample of 241 items of load on 12th November 2018.

1.9. Summary of previous audit

The previous audit was completed in May 2018 by Rebecca Elliot of Veritek Limited. The current status of that audit's findings are detailed below:

Table of Non-Compliance

Subject	Section	Clause	Non-compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	The variance between the database extract and the monthly report used by Trustpower for submission is potentially resulting in an estimated over submission of 283,709 kWh per annum if the database is correct.	Still existing
			The database accuracy is assessed to be 101.2% indicating an estimated under submission of 22,400 kWh per annum.	Cleared
			Incorrect ballasts recorded in RAMM.	Still existing

Subject	Section	Clause	Non-compliance	Status
ICP identifier	2.2	11(2)(a) and (aa) of Schedule 15.3	ICP not recorded against 201 items of load in the database.	Still existing
Description and capacity of each item of load	2.4	11(2)(c) and (d) of Schedule 15.3	315 items of load with incomplete details lamp. Ballast wattage is not recorded in the database.	Still existing
All load recorded in the database	2.5	11(2A) of Schedule 15.3	All load is not recorded in the database.	Still existing
Database accuracy	3.1	15.2 and 15.37B(b)	The database accuracy is assessed to be 101.2% indicating an estimated under submission of 22,400 kWh per annum. Incorrect ballasts recorded in RAMM.	Cleared Still existing
Volume information accuracy	3.2	15.2 and 15.37B(c)	The variance between the database extract and the monthly report used by Trustpower for submission is potentially resulting in an estimated over submission of 283,709 kWh per annum if the database is correct. The database accuracy is assessed to be 101.2% indicating an estimated under submission of 22,400 kWh per annum. Incorrect ballasts used for submission resulting in an estimated under submission of 1,506.81 per annum.	Still existing Cleared

Table of Recommendations

Subject	Section	Clause	Recommendation for improvement	Status
Tracking of load change	2.6	Review new streetlight electrical connection process with Unison.	Tracking of load change.	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

Trustpower 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.

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

Trustpower reconciles this DUML load using the STL profile. The on and off times are derived from data logger information. Trustpower receive a monthly wattage report and this is used to derive submission.

I recalculated the submissions for October 2018 using the data logger and the database information. I confirmed that the calculation method was correct, but found the differences detailed in the table below.

ICPs	Fittings number from Oct submission	Fittings number from database extract	Differences	kWh value submitted	Calculated kWh value from database	Differences
0000029279HR82A	34	34	0	929.473	929.473	0
0000031514WEC89	64	64	0	1,805.6	1,805.6	0
0001264720UN608	3201	3,228	27	97,510.88	92,282.87	-5,228.01
0008807420WM161	989	829	-160	30,869.18	25,133.32	-5,735.86
0008808341WM4B6	222	226	4	6,620.52	6,661.54	41.02
Total month kWh difference						-10,922.84

The variances are due to three reasons:

1. TDC were unable to supply the month end wattage report for October and Trustpower had to use the September report which will not reflect any light changes made for the month of October. I checked with Trustpower and was advised that this will not be replaced in subsequent revisions as the next extract to be provided will be for November. This is recorded as non-compliance below.
2. The ICPs highlighted in yellow have a variance in the items of load between the data extract provided and the monthly wattage report provided to Trustpower. This was found in the last audit.
3. The ballasts recorded in RAMM are incorrect and Trustpower add the ballasts outside of the database. TDC are working with RAMM to do a bulk update to correct this. This is discussed in **sections 2.4, 3.1** and **3.2**.

If the RAMM database extract data is correct this will be resulting in an estimated over submission of 131,074 kWh annually. I cannot confirm which value is correct.

There is potentially some static dimming installed on the network, but I note that the expected lamp wattage is recorded in RAMM. TDC are investigating this and will work with Trustpower to determine how this is to be managed, if confirmed to be present as over submission will be occurring. TDC have no plans to have dynamic dimming on their network.

32 items of load have no ICP recorded against them resulting in an estimated 11,344 kWh of under submission per annum. This is detailed in **section 2.2**.

I have summarised below the kWh variances where I am able to calculate them:

Detail of submission variances	Volume information impact (annual kWh)
Variance between RAMM extract and Trustpower's submission volumes	131,074 kWh over submission
32 items of load with no ICP recorded	11,344 kWh under submission

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 01-May-18 To: 31-Oct-18	The variance between the database extract and the monthly report used by Trustpower for submission is potentially resulting in an estimated over submission of 131,074 kWh per annum, if the database is correct. The September wattage report has been applied to the month of October and is not expected to be replaced through the revision process. Incorrect ballasts recorded in RAMM. ICP not recorded against 32 items of load in the database resulting in an estimated 14,179 kWh of under submission per annum. Potential impact: High Actual impact: High Audit history: Once previously Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	The controls have been improved during the audit period and are therefore rated as moderate. The impact is assessed to be high due to the potential kWh variances found.

Actions taken to resolve the issue	Completion date	Remedial action status
Trustpower will work closely with TDC to ensure that their processes for capturing and recording correct ballasts in RAMM are understood by the Council and their contactors.	Ongoing	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Trustpower will work monitor the data closely, starting with the December 2018 data.	Ongoing	

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

Code reference

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

Code related audit information

The 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 an ICP is recorded for each item of load.

Audit commentary

The database was checked and found 40 items of load without an ICP recorded. These were discussed and found:

- Six items of load with no light ID assigned. TDC explained this is because the pole is present, but the light has not been installed yet. RAMM databases usually have the facility to add lights but indicate them as not connected in the ICP field so that they only get added to the monthly wattage report once they are electrically connected. I recommend that TDC investigate this.

Description	Recommendation	Audited party comment	Remedial action
ICP Identifier	Liaise with RAMM to utilise the "not connected" indicator available in RAMM.	TDC will investigate and Trustpower will work closely with the TDC to ensure that database is accurate over the next three months.	Investigating

- 30 of these lights are jointly owned between the council and the airport and the council do not own the asset. These either need to be added to the council DUML ICP, or a new DUML database created with an ICP be created to account for this load.
- It is unclear why the remaining four items of load do not have an ICP assigned.

These items of load are being investigated by TDC.

Assuming that the 32 items of load with lights installed were 70W HPS (the most common light type present), this would result in under submission of 11,344 kWh per annum based on burn hours of 4,271 annually.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.2 With: Clause 11(2)(a) and (aa) of Schedule 15.3 From: 01-May-18 To: 31-Oct-18	ICP not recorded against 32 items of load in the database resulting in an estimated 11,344 kWh of under submission per annum. Potential impact: Medium Actual impact: Medium Audit history: Once Controls: Moderate Breach risk rating: 4
Audit risk rating	**Rationale for audit risk rating**
Medium	The controls are rated as moderate as all but 40 items of load have an ICP recorded. The impact is assessed to moderate based on the estimated volume of under submission.

Actions taken to resolve the issue	Completion date	Remedial action status
Trustpower will work with TDC to rectify these the ICP discrepancy.	Feb 2019	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Trustpower will monitor the data on a monthly basis, commencing December 2018.	Feb 2019	

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 the nearest street address, pole numbers and Global Positioning System (GPS) coordinates for each item of load, and users in the office and field can view these locations on a mapping system.

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 contains two fields for wattage, firstly the manufacturers rated wattage and secondly the "ballast wattage". The ballast wattage is expected to be a calculated figure which accounts for any variation from the input wattage and includes losses associated with ballasts. Examination of the database against the items of load with an ICP associated found:

- 219 items of load with no gear wattage figure recorded, this is reduction from the 295 found in the last audit
- nine items of load with blank or zero lamp wattage recorded
- two items of load with unknown or no lamp description recorded.

TDC have the Electricity Authority's standardised wattage values and are working with RAMM to get these uploaded. The 230 items of load with missing data are recorded as non-compliance.

The ballasts recorded in RAMM are not used for submission but are added by Trustpower as part of the submission process. This is recorded as non-compliance. The accuracy of the ballast wattages used for submission are discussed in **section 3.2.**

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.4 With: Clause 11(2)(c) and (d) of Schedule 15.3 From: 01-May-18 To: 31-Oct-18	230 items of load with incomplete lamp details. Potential impact: Medium Actual impact: Low Audit history: Once Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls have been strengthened during the audit period and are rated as moderate. The impact is assessed to be low, as the impact of the incorrect ballasts (detailed in **section 3.2**) is low.

Actions taken to resolve the issue	Completion date	Remedial action status
Trustpower visited the customer and determined that there was work to be done between the customer and the contractor.	30/11/18	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Trustpower will monitor the data being submitted each month and guide the customer in effective practices.	Feb 2018	

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 241 items of load on 12th November 2018.

Audit commentary

The field audit findings are detailed in the table below:

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
Rural					
KARAMU STREET MANGAKINO	7	9	2		2x extra 70W HPS found in the field

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
MIRO STREET MANGAKINO	3	3			
TANIWHA STREET	3	3			
TAWA STREET MANGAKINO	1	1			
Taupo A-M					
ANZAC MEMORIAL DRIVE	1	1			
BATTERSEA PLACE	2	2			
BELVEDERE GROVE	3	3			
BOUNDARY ROAD	6	6			
CLARKE GROVE	1	1			
CUMBERLAND STREET	4	4			
DUNCAN STREET	2	3	1		1x extra 70W HPS found in the field
GASCOIGNE STREET	5	5			
HATEPE AVENUE	14	14			
HINEMAIAIA LANE	2	2			
HOLLAND GROVE	2	3	1		1x extra LED found in the field
JOHN STREET	3	3			
KAPUKA PLACE	1	1			
KEMPTON PLACE	3	3		1	1x incorrect wattage recorded as LED in the database but 70W HPS found in the field
KRISSELL PLACE	2	2			
LARCHWOOD GROVE	1	1			
LISLAND DRIVE RAB	3	3			
LOWELL PLACE	3	2	-1		1x 70W HPS not found in the field- recorded as double headed but is a single fixture
MACDONELL STREET	3	3			
MAHUTA ROAD ACCESS NO 3	1	1			

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
MAMAKU STREET	2	2			
MARSHALL AVENUE	8	8			
MATIPO STREET	3	3			
MOHI PLACE	2	2			
MONTGOMERY CRESCENT	14	14			
MOTUTERE AVENUE	1	1			
Taupo N-Z					
NOBLE STREET	6	6			
PAORA HAPI STREET	11	11		2	2x incorrect wattages recorded as 150W HSP but LED found in the field
PARATA STREET	4	4			
PITIROI STREET	5	5			
RAYWOOD CRESCENT	12	12			
RIVERBANK ROAD	2	2			
ROTOKAWA STREET	11	11		2	2x incorrect wattages recorded as LED but HPS found in the field
SERVICE LANE NO 2	2	2			
SERVICE LANE NO 3	10	10			
SHEPHERD ROAD	18	20	2		2x extra HPS found in the field
SHERA STREET	3	3			
SILICH STREET	2	2			
SUNSET STREET	6	6		6	6x incorrect wattages recorded as HPS but LED found in the field
WAITAHANUI AVENUE	2	2		2	2x incorrect wattages recorded as HPS but LED found in the field
WEMBLEY PLACE	3	3			
Turangi					

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
HINEKAPI TERRACE	4	4			
HINERANGI PLACE	1	1			
KAHOTEA DRIVE	13	13			
KAIWAKA STREET	1	1		1	1x incorrect wattage recorded as 70W HPS in the database but LED found in the field
KAMAHI TERRACE	2	2			
NGAUMU STREET	2	2			
PAREHOPU STREET	3	3			
RANGIWHERO STREET	2	2			
TAMAKUI GROVE	3	3			
TAWIRI PLACE	1	1			
TE MITIOTU GROVE	4	4			
TUKI STREET	2	2			
Grand Total	**241**	**246**	**6**	**14**	

I found seven lamp and 14 wattage variances in the sample checked. These differences and the database accuracy are recorded as non-compliance in **section 3.1**. Six additional items of load were found in the field. This is recorded as non-compliance.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3 From: 01-May-18 To: 31-Oct-18	All load is not recorded in the database. Potential impact: Low Actual impact: Low Audit history: Once Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as moderate as the processes to capture change will mitigate risk most of the time. The impact is assessed to be low, based on the estimated database accuracy recorded in **section 3.1**.

Actions taken to resolve the issue	Completion date	Remedial action status
Trustpower met with the customer determine why the load is not being recorded in the database	November 2019	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Trustpower will monitor the data being received each month and provide guidance to ensure that the database is updated effectively	Feb 2019	

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

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 provision of a copy of the report to Trustpower each month is sufficient to achieve compliance.

The database tracks additions and removals as required by this clause.

TDC use a RAMM database to manage this DUML load. The LED roll out, new connections, fault and maintenance work is completed by Downer. Downer carry out all of the field work including any new individual lights that are added to the streetlight circuits. They provide all field changes via a daily spreadsheet with the relevant information to both the council and for data input into RAMM. Downer have engaged an ex-TDC employee to oversee the inputting of this data to RAMM. They have a detailed understanding of the data requirement, so it is expected that the quality of the data input is to be high. All changes made during a month are included in the monthly report provided to Trustpower for submission. The LED roll out is in progress and is expected to be completed by the end of the next financial year, June 2019.

TDC have undertaken a review of the management of the tracking of load changes in the RAMM database during the audit period. In relation to new subdivisions, prior to the signing off the section 224C that is required before the subdivision is vested to council, a check of all of the "as-builts" is required. The sign off will not be granted before the council is satisfied that the information required is complete. Once the subdivision is vested the assets are added to RAMM. As the building of houses is unlikely to occur (and this is the usually the trigger for street lights to go on) prior to titles being issued, it is unlikely that streetlights are connected prior to this time, but I recommend that Trustpower and TDC liaise with the Unison and the Lines Company to ensure that the process is well mapped between the parties. Field audits of new assets are planned to ensure that the "as-builts" provided are a correct representation of what is installed in the field.

Description	Recommendation	Audited party comment	Remedial action
Tracking of load change	Liaise with the networks to confirm process understanding of new streetlight circuit electrical connection.	Trustpower and TDC liaise with the Unison and the Lines Company to ensure that the process is well mapped between the parties.	Investigating

There are no outage patrols are in place. This is done on a reactive basis.

Festive lights are connected into the unmetered circuits and these are added and removed for the relevant months. A copy of the relevant months wattage report confirmed this.

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

A complete audit trail of all additions and changes to the database information.

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	Taupo district
Strata	The database contains items of load in Taupo area. The area has three distinct sub groups of urban, rural, NZTA. The processes for the management of TDC items of load are the same, but I decided to place the items of load into four strata, as follows: 1. Rural 2. Turangi 3. A-M Council Roading 4. N-Z Council Roading.
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 46 sub-units.
Total items of load	241 items of load were checked.

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

Audit commentary

A statistical sample of 241 items of load found that the field data was 98.8% of the database data for the sample checked. This is within the required database accuracy of 2.5%+/-. The statistical sampling tool reported with 95% confidence the precision of the sample was 12.4% and the true load in the field will be between 92.3% to 104.7% of the load recorded in the database. The sample is not sufficiently precise to be able to determine the database accuracy but indicates that the database is potentially over submitting.

The tool indicated that there is potentially 19,600 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 that there is a potential estimated submission variance range of between 125,800 kWh and 75,800 kWh over submission.

Wattages for all items of load were checked against the published standardised wattage table produced by the Electricity Authority and found the ballasts recorded in RAMM are incorrect. TDC have the Electricity Authority's standardised wattage values and are working with RAMM to get these uploaded. Trustpower add the ballasts outside of the database. These were not provided for this audit therefore I am unable to confirm the ballasts being applied but note that a variance was found in the last audit. The incorrect ballasts recorded in RAMM are recorded as non-compliance below and in **sections 2.1** and **3.2**.

Analysis of the database identified 230 items of load with incomplete or missing lamp details. This is recorded as non-compliance in **section 2.4** and below.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 01-May-18 To: 19-Nov-18	230 items of load with incomplete lamp details. Incorrect ballasts recorded in RAMM. Potential impact: High Actual impact: Unknown Audit history: Once previously Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as moderate, because they are sufficient to ensure that changes to the database are correctly recorded most of the time. The impact is assessed to be high due to the unknown impact the incorrect ballasts being applied are.

Actions taken to resolve the issue	Completion date	Remedial action status
Trustpower will work closely with TDC to ensure that their processes for capturing and recording correct ballasts in RAMM are understood by the Council and their contactors.	Ongoing	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Trustpower will work monitor the data closely, starting with the December 2018 data.	Ongoing	

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
- checking the database extract combined with the burn hours against the submitted figure to confirm accuracy.

Audit commentary

Trustpower reconciles this DUML load using the STL profile. The on and off times are derived from data logger information. Trustpower receive a monthly database extract and this is used to derive submission.

I recalculated the submissions for October 2018 using the data logger and the database extract information. I confirmed that the calculation method was correct but found, as detailed in **section 2.1**, a variance and this is due to three factors:

1. TDC were unable to supply the month end wattage report for October and Trustpower had to use the September report which will not reflect any light changes made for the month of October. This will not be replaced in subsequent revisions as the next extract to be provided will be for November. This is recorded as non-compliance below.
2. Two ICPs have a variance in the items of load between the data extract provided and the monthly wattage report provided to Trustpower. This was also present in the last audit.
3. The ballasts recorded in RAMM are incorrect and Trustpower add the ballasts outside of the database. TDC are working with RAMM to do a bulk update to correct this. This is discussed in **sections 2.1**, **2.4** and **3.1**.

If the RAMM database extract data is correct this will be resulting in an estimated over submission of 131,074 kWh annually. I cannot confirm which value is correct.

There is potentially some static dimming installed on the network, but I note that the expected lamp wattage is recorded in RAMM. TDC are investigating this and will work with Trustpower to determine how this is to be managed, if confirmed to be present as over submission will be occurring. TDC have no plans to have dynamic dimming on their network.

32 items of load have no ICP recorded against them resulting in an estimated 11,344 kWh of under submission per annum. This is detailed in **section 2.2**.

I have summarised below the kWh variances where I am able to calculate them:

Detail of submission variances	Volume information impact (annual kWh)
Variance between RAMM extract and Trustpower's submission volumes	131,074 kWh over submission
32 items of load with no ICP recorded	11,344 kWh under submission

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: 01-May-18 To: 31-Oct-18	The variance between the database extract and the monthly report used by Trustpower for submission is potentially resulting in an estimated over submission of 131,074 kWh per annum if the database is correct. The September wattage report has been applied to the month of October and will not be replaced through the revision process. Incorrect ballasts recorded in RAMM. ICP not recorded against 32 items of load in the database resulting in an estimated 14,179 kWh of under submission per annum. Potential impact: High Actual impact: High Audit history: Once previously Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	The controls have been improved during the audit period and are therefore rated as moderate. The impact is assessed to be high due to the kWh variances found.

Actions taken to resolve the issue	Completion date	Remedial action status
Trustpower will work closely with TDC to ensure that their processes for capturing and recording correct ballasts in RAMM are understood by the Council and their contactors.	Ongoing	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Trustpower will work with TDC to rectify these issues	Ongoing	

CONCLUSION

TDC use a RAMM database to manage this DUML load. New connection, fault and maintenance work is completed by Downer. Monthly reports are received by Trustpower.

TDC have undertaken a review of the RAMM database management processes and strengthened them as a result. They have commenced an LED roll out and this is expected to be complete by June 2019. They are working with RAMM to upload the correct ballasts to the database but at the time of this audit these are being added outside of the database. Overall the database accuracy is improving.

As was found in the last audit, from analysis of the volumes submitted by Trustpower and the database extract it appears that the data is being updated outside of the RAMM database. If the raw database data is correct this will be resulting in an estimated over submission of 131,074 kWh annually. I cannot confirm which is correct.

The future risk rating of 26 indicates that the next audit be completed in three months, but I recommend that the next audit be due in six months. This should give sufficient time to correct the database and check that the submission values match to the database and that corrections have been made. Six non-compliances were identified, and two recommendations were made.

PARTICIPANT RESPONSE

Trustpower will work with Taupo District Council to rectify these non- compliant issues.

TDC have employed a new RAMM Operator and is still in the training stage. Updating the database is a top priority and Trustpower will work with them to have this compliant as soon as possible.