ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

For

TARARUA DISTRICT COUNCIL AND CONTACT ENERGY

Prepared by: Tara Gannon

Date audit commenced: 8 May 2018

Date audit report completed: 14 May 2018

Audit report due date: 1 June 2018

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EXECUTIVE SUMMARY

This audit of the Tararua District Council (TDC) DUML database and processes was conducted at the request of Contact Energy (Contact) 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.

Tararua Alliance maintains streetlight information in TDC's RAMM database.

New connection, fault, maintenance and upgrade work is completed by Scanpower for lights on the Scanpower Network, and Powerco on the Powerco Network. C & J Contractors also complete some maintenance work. An LED upgrade project is well underway, and is expected to be completed by 30 June 2018. TDC does not intend to use a centralised management system.

Scanpower, Powerco, and C & J Contractors invoice Tararua Alliance and provide supporting information which includes details of any maintenance, replacements and new installations. Tararua Alliance uses this invoice information to update RAMM.

NZTA lights are recorded in the database, but NZTA does not provide information when lights are added or changed. Only work invoiced to TDC is updated in the database.

Historically there has not been regular reporting from the database to Contact. Contact's submissions have been based on data provided in May 2017. Contact filled gaps in the data like missing ICPs (based on location) and missing and incorrect wattage information (based on the light makes and models recorded).

A report from RAMM was provided by Tararua Alliance in April 2018, and they intend to supply monthly reports to Contact from now on. There are some issues with the accuracy of the data provided, and Contact intends to work with Tararua Alliance to resolve these issues and then migrate to using the monthly submission data. Once accuracy is confirmed, updated data will be used for revision submissions where available.

Tararua Alliance have indicated that they want to resolve these issues, and improve the accuracy of their database.

The future risk rating of 33 indicates that the next audit be completed in 3 months. I recommend that the next audit date should be in at least six months, to allow time for the LED upgrade to be completed and the database accuracy issues to be resolved. Seven non-compliances were identified, and four recommendations were raised.

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 used to prepare submissions is out of date.	Weak	Medium	6	Identified
ICP identifier and items of load	2.2	11(2)(a) and (aa) of Schedule 15.3	ICP number is not recorded for 208 items of load.	Weak	Low	3	Identified
Description and capacity of load	2.4	11(2)(c) and (d) of Schedule 15.3	Six items of load do not have complete and accurate description and load information recorded. 168 items of load are expected to have a gear wattage recorded, but the gear wattage is blank.	Weak	Medium	6	Identified
All load recorded in database	2.5	11(2A) of Schedule 15.3	Eight lamps were not recorded in the database.	Weak	Low	3	Identified
Tracking of load changes	2.6	11(3) of Schedule 15.3	Updates to the database can be delayed.	Weak	Low	3	Identified
Database accuracy	3.1	15.2 and 15.37B(b)	The database contains some incorrect and missing information.	Weak	Medium	6	Identified
Volume information accuracy	3.2	15.2 and 15.37B(c)	The database used to prepare submissions is out of date.	Weak	Medium	6	Identified
Future Risk Rating						33	

Future risk rating	1-3	4-6	7-8	9-17	18-26	27+
Indicative audit frequency	36 months	24 months	18 months	12 months	6 months	3 months

RECOMMENDATIONS

Subject	Section	Description	Recommendation
ICP data	1.6	ICP data	Confirm whether this ICP 7012020000CH14D is standard or distributed unmetered load, and work with TDC to update the database if necessary
All load recorded in the database	2.5	Inclusion of under verandah lights.	Check under the verandah lights in Pahiatua and add them to the database if they are unmetered.
Tracking of load changes	2.6	Maintaining NZTA lights in the database.	Work with NZTA to either: 1. Hand over responsibility for maintaining a database of NZTA lights in the TDC area; or 2. Establish a process to ensure that NZTA light information is maintained in the TDC database.
Tracking of load changes	2.6	Timeliness of updates.	Ensure that all database changes are processed prior to providing database reports to Contact each month.

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.

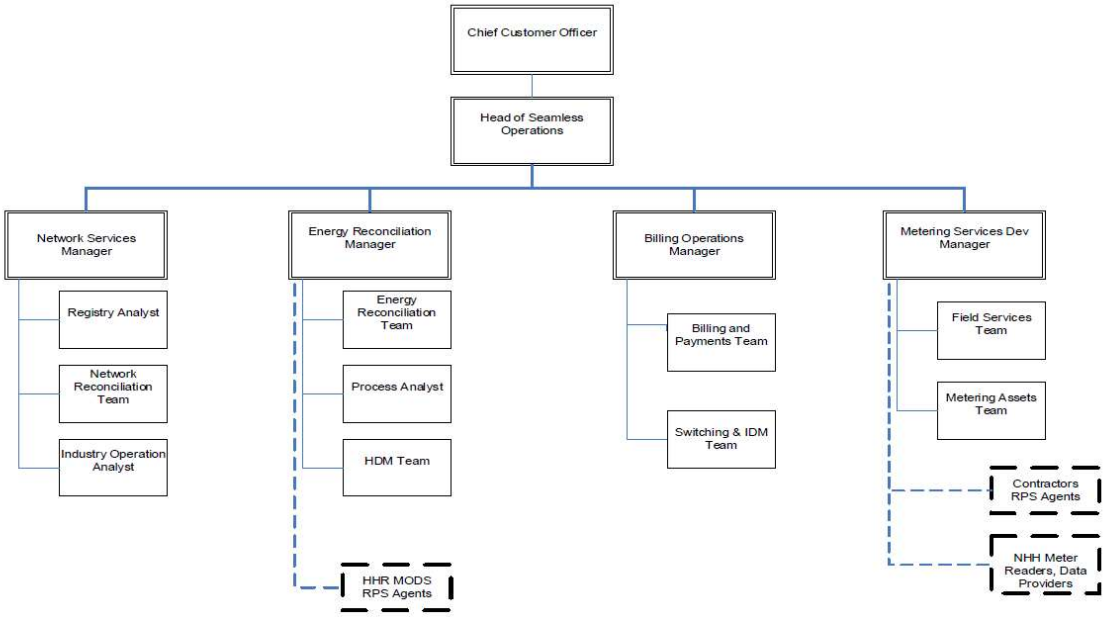
Audit commentary

There is one exemption in place relevant to the scope of this audit:

Exemption No. 177: Exemption to clause 8(g) of schedule 15.3 of the Electricity Industry Participation Code 2010 ("Code") in respect of providing half-hour ("HHR") submission information instead of non half-hour ("NHH") submission information for distributed unmetered load ("DUML"). This exemption expires at the close of 31 October 2023.

1.2. Structure of Organisation

Contact 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
Buster Sandford	Asset Engineer	Tararua Alliance
Ray Cannon	Performance Manager	Tararua Alliance
Peter Wimsett	Manager Strategy and District Development	Tararua District Council
Aaron Wall	HDM Team Leader	Contact Energy
Bernie Cross	Energy Reconciliation Manager	Contact Energy

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.

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)
0009100000CADDC	Dannevirke Street Lighting - Dannevirke Borough	DVK0111	HHR	670	49,281
0009101000CAC7C	Street Lighting - Rural Streetlighting	DVK0111	HHR	92	3,935
0009102000CAE9C	Street Lighting - Woodville Borough	WDV0111	HHR	241	12,449

ICP Number	Description	NSP	Profile	Number of items of load	Database wattage (watts)
1000554957PC423	TDC Master Streetlight	MGM0331	HHR	347	11,880
			Total	**1,350**	**77,545**

ICP 7012020000CH14D is recorded as standard unmetered load of 0.49 kW and RPS profile and is not recorded in the DUML database. I recommend that Contact determine whether this ICP is standard or distributed unmetered load, and work with TDC to update the database if necessary.

Description	Recommendation	Audited party comment	Remedial action
ICP data	Confirm whether this ICP 7012020000CH14D is standard or distributed unmetered load, and work with TDC to update the database if necessary	This ICP relates to streetlights for a small township called Herbertville. Contact will investigate with Tararua DC regarding whether these may be Council or Transit lights before determining the need to update these into the DUML database.	Investigating

1.7. Authorisation Received

All information was provided directly by Contact, TDC, and Tararua Alliance.

1.8. Scope of Audit

Tararua Alliance maintains streetlight information in TDC's RAMM database.

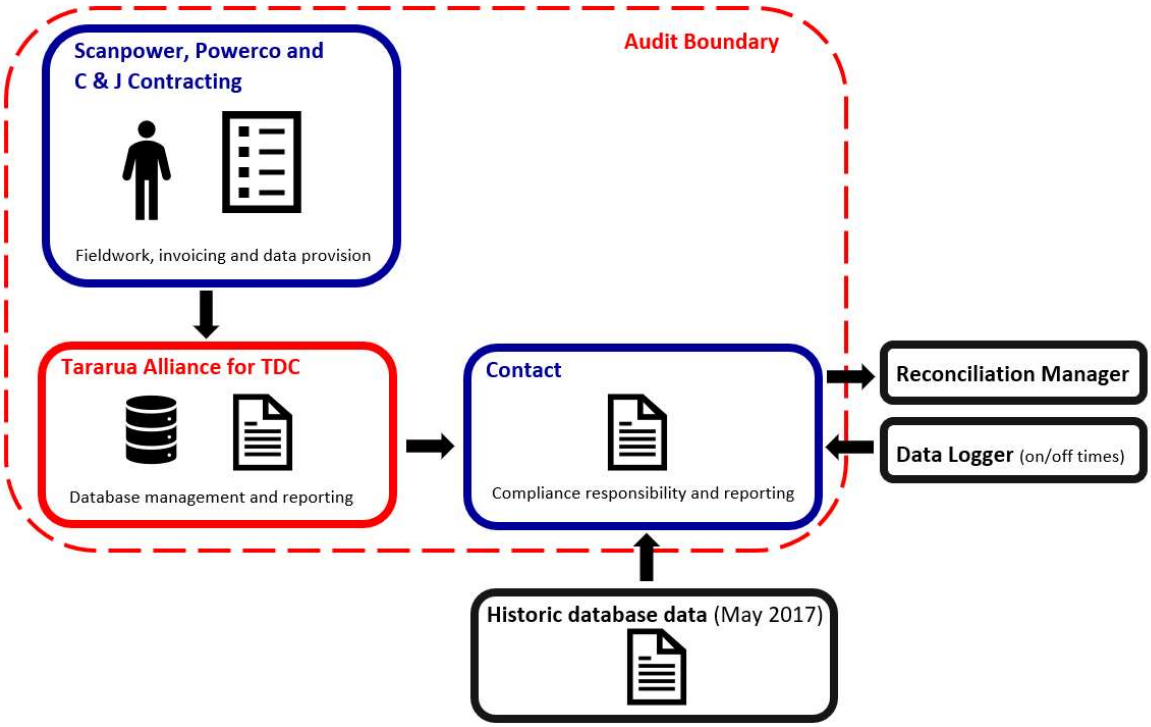
New connection, fault, maintenance and upgrade work is completed by Scanpower for lights on the Scanpower Network, and Powerco on the Powerco Network. C & J Contractors also complete some maintenance work. An LED upgrade project is well underway, and is expected to be completed by 30 June 2018.

Scanpower, Powerco, and C & J Contractors invoice Tararua Alliance and provide supporting information which includes details of any maintenance, replacements and new installations. Tararua Alliance uses this invoice information to update RAMM.

NZTA lights are recorded in the database, but NZTA does not provide information when lights are added or changed. Only work invoiced to TDC is updated in the database.

Historically there has not been regular reporting from the database to Contact. A report from RAMM was provided by Tararua Alliance in April 2018, and they intend to supply monthly reports to Contact from now on. There are some issues with the accuracy of the data provided, and Contact intends to work with Tararua Alliance to resolve these issues and then migrate to using the monthly submission data.

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

The field audit was undertaken of a statistical sample of 151 items of load on 8 May 2018. The sample was selected from two strata:

- NZTA; and
- all other light owners.

1.9. Summary of previous audit

The previous audit was completed in September 2015 by Rebecca Elliot of Veritek Limited. Four non-compliances were identified, and three recommendations were made. The statuses of the non-compliances and recommendations are described below.

Subject	Section	Clause	Non-compliance	Status
Deriving submission information	2.1	11(1) of schedule 15.3	Under submission by 75,000 kWh.	Some issues still exist. Refer to **section 2.1**.
ICP identifiers	2.2.1	11(2)(a) of schedule 15.3	No ICP identifier recorded in RAMM for seven items of load.	Still existing. Refer to **section 2.2**.

Subject	Section	Clause	Non-compliance	Status
Capacity of load	2.2.4	11(2)(d) of schedule 15.3	Incorrect or no gear wattage recorded in RAMM.	Still existing. Refer to **section 3.1**.
Tracking of Load Change	2.3	11(3) of schedule 15.3	Field count found inaccuracies with database count and wattage recorded. Festive lighting not captured in RAMM.	Still existing. Refer to **section 2.5**. Cleared, festive lighting is used in Woodville and Dannevirke but Tararua Alliance advised it is connected to shops' electricity supplies not streetlight circuits.

Subject	Section	Clause	Recommendation	Status
Data transmission	1.8	20 of schedule 15.2	Apply password protection to the monthly report.	Assessment of data transmission is no longer required.
Deriving Submission Information	2.1	11(1) of schedule 15.3	Confirm database accuracy and determine correct allocation of load to each NSP before the current RAMM can be used for submission.	Still existing. Refer to **section 2.1**.
Festive lighting	2.3	11(3) of schedule 15.3	Ensure Festive lights are included in submission totals.	Cleared, festive lighting is used in Woodville and Dannevirke but Tararua Alliance advised it is connected to shops' electricity supplies not streetlight circuits.

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

Contact 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

Contact reconciles this DUML load using the HHR profile, in accordance with exemption number 177. This exemption is discussed further in **section 1.1**.

Until April 2018, regular reports from the database were not provided. Submissions were based on historic database information provided in May 2017, with on and off times derived from data logger information. Contact filled gaps in the data like missing ICPs (based on location) and missing and incorrect wattage information (based on the light makes and models recorded).

I recalculated the submissions for March 2018 for all four ICPs using the March 2018 data logger information and the May 2017 database information corrected by Contact, and found that the calculation was correct.

ICP	Actual Submission March 2018	Recalculated Submission based on May 2017 data	Difference
0009100000CADDC	15,977.99	15,977.99	-
0009101000CAC7C	5,620.96	5,620.96	-
0009102000CAE9C	6,957.34	6,957.34	-
1000554957PC423	10,788.27	10,788.27	-
Total	**39,344.56**	**39,344.56**	**-**

I also recalculated the March 2018 submission based on the database provided during April 2018 and the March 2018 data logger hours. I found that the difference in submission was 11,315 kWh.

ICP	Actual Submission March 2018	Recalculated submission based on April 2018 database	Difference
0009100000CADDC	15,977.99	17,813.93	1,835.94
0009101000CAC7C	5,620.96	1,422.41	-4,198.55
0009102000CAE9C	6,957.34	4,500.02	-2,457.32
1000554957PC423	10,788.27	4,294.34	-6,493.93
Total	**39,344.56**	**28,030.71**	**-11,313.85**

It is difficult to assess the accuracy of the submission information, for several reasons:

- There are some issues with the accuracy of the data provided in April 2018 which are recorded as non-compliance and discussed in **sections 2.2**, **2.4**, **2.5**, **2.6** and **3.1**. Contact intends to work with Tararua Alliance to resolve these issues and then migrate to using the monthly submission data. Updated data will be used for revision submissions where available.
- An LED upgrade is in progress which has resulted in rapid changes to the lamps installed. The data provided in April 2018 may not reflect what was installed in March 2018.
- Contact filled gaps in the data like missing ICPs (based on location) and missing and incorrect wattage information (based on the light makes and models recorded).

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: unknown To: 08-May-18	The database used to prepare submissions is out of date. Potential impact: Medium Actual impact: Unknown Audit history: Twice previously Controls: Weak Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
Medium	The controls are rated as weak overall. The database used to calculate submissions was out of date. Based on review of the current database in **section 3.1**, it appears likely that the May 2017 database version used for submission also contained some inaccurate information. The impact is assessed to be medium, based on the kWh differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
Personnel changes at Tararua Alliance has resulted in infrequent provision of DUML values. When comparing the May 2017 database to the May 2018 database output (adjusted for ICPs numbers and correct ballast values) the difference between the two database extracts is 2.828 KW of connected load. Report Tararua Alliance have committed to monthly provisions of a database extract. Tararua Alliance have also committed to ensuring all ICP, ballast value and LED upgrades are updated within the database on Tararua DC's behalf during May 2018. Once this has been completed Contact will review the database accuracy again against the field audit results.	July 2018	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
As above	As 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 an ICP is recorded for each item of load.

Audit commentary

ICP numbers are not recorded for 208 items of load.

Light Owner	Total with missing ICP numbers
Council Road lighting	3
Local Authority	1
Transit NZ	203
Blank	1
Total	**208**

This is recorded as non-compliance below.

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: 08-May-18	ICP number is not recorded for 208 items of load. Potential impact: High Actual impact: Low Audit history: Twice previously Controls: Weak Breach risk rating: 3
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as moderate overall, as they are sufficient to ensure that most items of load have an ICP number recorded. Controls over recording of ICP numbers for NZTA ICPs are weak. 38,468 watts are recorded in the database for items of load with no ICP number. Based on this, the potential impact is high. The actual impact is low, because Contact's submissions are based on May 2017 data and Contact has recorded ICP numbers for each item of load. Most of the lights with missing ICP numbers are owned by NZTA.

Actions taken to resolve the issue	Completion date	Remedial action status
Personnel changes at Tararua Alliance has resulted in infrequent provision of DUML values. Tararua Alliance have also committed to ensuring all ICP, ballast value and LED upgrades are updated within the database on Tararua DC's behalf during May 2018. Once this has been completed Contact will review the database accuracy again against the field audit results.	July 2018	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
As above	As above	

2.3. Location of each item of load (Clause 11(2)(b) of Schedule 15.3)

Code reference

Clause 11(2)(b) of Schedule 15.3

Code related audit information

The DUML database must contain the location of each DUML item.

Audit observation

The database was checked to confirm the location is recorded for all items of load.

Audit commentary

All items of load have a street name, or highway location recorded. Each item has a route position which can be mapped by system users.

Audit outcome

Compliant

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

Code reference

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

Code related audit information

The DUML database must contain:

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

Audit observation

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

Audit commentary

The database records make, model, lamp wattage, and gear wattage.

Six items of load have missing make, model, lamp wattage, and/or gear wattage. The correct wattages for these items are unknown.

Owner	Pole Number	Light ID	Light Make Model	Model	Model	Gear Wattage	Lamp Wattage
Transit NZ	P07266	1432	CR			0	
Transit NZ	P07253	1435	CR (4000)			0	
Local Authority	P12280	1088	CR (4000)			0	
	L602	1475	CR (4000)			0	
Local Authority	P37441		G (500)	UNK	Unknown	0	0
		2574	-500	150S			

A further 168 items of load have blank gear wattage where the gear wattage is not expected to be zero. The expected gear wattage for these items is 2,915 watts.

Model	Count of lights with blank gear wattage	Expected gear wattage per fitting	Expected gear wattage x count	Comment
100W High Pressure Sodium Vapour	7	14 W	98 W	
150W High Pressure Sodium	1	18 W	18 W	
150W High Pressure Sodium Vapour	46	18 W	828 W	
250W High Pressure Sodium Vapour	36	28 W	1,008 W	
70W High Pressure Sodium	5	13 W	65 W	
70W High Pressure Sodium Vapour	56	13 W	728 W	
80W High Pressure Sodium Vapour	1	10 W	10 W	Expected to be mercury vapour
80W Mercury Vapour	16	10 W	160 W	
Total	**168**		**2,915 W**	

Tararua Alliance intends to correct the incorrect wattages during May 2018.

The field audit found a large proportion of sodium and mercury vapour lamps recorded in the database had been replaced with LED lamps in the field. I expect that the actual gear wattage difference will be less than 2,915 watts because some of these lamps are likely to have been replaced with LEDs. It is expected that almost all lamps will be replaced with LEDs by 30 June 2018.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.4 With: Clause 11(2)(c) and (d) of Schedule 15.3 From: unknown To: 08-May-18	Six items of load do not have complete and accurate description and load information recorded. 168 items of load are expected to have a gear wattage recorded, but the gear wattage is blank. Potential impact: Medium Actual impact: Low Audit history: None Controls: Weak Breach risk rating: 3

Audit risk rating	Rationale for audit risk rating
Medium	The controls are rated as weak because they are not sufficient to ensure that wattage and gear information is consistently recorded. The potential impact is medium based on wattage differences of at least 2,915 W or approximately 12,449 kWh per annum. Contact's submissions are based on May 2017 data, and Contact has recorded lamp and gear wattages each item of load based on the lamp makes and models recorded. Because of the LED upgrade, it is likely that some of the lamp makes and models recorded were incorrect. I estimate the impact will be medium.

Actions taken to resolve the issue	Completion date	Remedial action status
Tararua Alliance on behalf of Tararua DC have committed to updating the database with correct wattage values and descriptions during May 2018. Once this has been completed Contact will review the database accuracy again against the field audit results.	July 2018	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
As above	As above	

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 151 items of load on 8 May 2018. The sample was selected from two strata:

- NZTA; and
- All other light owners.

Audit commentary

The field audit findings are detailed in the table below.

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
NZTA					
MCLEAN ST	31	31	-	6	Six 250W sodium lamps were replaced with L86 LED lamps. Two

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
					150W metal halide lamps were recorded as 150W sodium lamps in the database.
All other light owners					
ATKINSON ST	7	7	-	-	
BURGOYNE ST	9	9	-	-	
CHRISTIAN ST	14	14	-	8	Eight sodium lights were replaced with 23 or 27W LEDs.
COLE ST	21	20	-1	14	14 70W sodium lamps were replaced with 23 or 27W LEDs. One lamp recorded in the database was not located.
GERTRUDE ST	5	6	1	3	Three 70W sodium lamps were replaced with 23 or 27W LEDs. One lamp not recorded in the database was found.
GRANT ST (D)	7	7	-	5	Five 70W sodium lamps were replaced with 23W LEDs.
HALL ST (D)	6	5	-1	4	Four 70W sodium lamps were replaced with 23 or 27W LEDs. One lamp recorded in the database was not located.
HALL ST (W)	8	8	-	-	
HARTGILL CRES	5	8	3	2	Two 70W sodium lamps were replaced with 23 or 27W LEDs. Three lamps not recorded in the database were found.
HENDERSON ST	1	1	-	1	One 70W sodium lamp was replaced with a 27W LED.
MAINE ST	4	4	-	3	Three 70W sodium lamps were replaced with 27W LEDs.
PINFOLD RD	1	1	-		
RUNCIMAN PL	3	3	-	4	Four 70W sodium lamps were replaced with 23 or 27W LEDs.
SOWRY RD	11	11	-		

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
STATION ST	0	4	4	-	Three 150W lights and one 23W LED light were missing from the database.
TRAFALGAR ST	17	19	2	15	14 70W sodium lamps and one 80W MV lamp were replaced with 23 or 27W LEDs. Two lamps not recorded in the database were found.
WEBER ST	1	1	-	-	
Total	**151**	**159**	**8**	**65**	

I found eight more lamps in the field than were recorded in the database for the sample checked, this is recorded as non-compliance below.

65 lamp wattage differences were found; these appeared to be timing differences related to LED upgrades. These differences are recorded as non-compliance in **section 3.1**.

Tararua Alliance believes under verandah lights in Pahiatua are unmetered and are not recorded in the database. I recommend that these lights should be checked, and their details updated in the database if they are unmetered.

Description	Recommendation	Audited party comment	Remedial action
All load recorded in the database	Check under the verandah lights in Pahiatua, and add them to the database if they are unmetered.	Contact will work with Tararua Alliance to undertake the required investigations	Identified

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3 From: unknown To: 04-May-18	Eight lamps were not recorded in the database. Potential impact: Low Actual impact: Low Audit history: Twice previously Controls: Weak Breach risk rating: 3

Audit risk rating	Rationale for audit risk rating
Low	Controls are rated as weak as they are not sufficient to ensure that all lights, are recorded in the database. The impact is unknown but is rated as low, as eight lights were missing from the database.

Actions taken to resolve the issue	Completion date	Remedial action status
Tararua Alliance on behalf of Tararua DC have committed to updating the database with correct wattage values and descriptions during May 2018. Once this has been completed Contact will review the database accuracy again against the field audit results.	July 2018	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
As above	As above	

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 Contact each month is sufficient to achieve compliance.

New connection, fault, maintenance and upgrade work is completed by Scanpower for lights on the Scanpower Network, and Powerco on the Powerco Network. C & J Contractors also complete some maintenance work. An LED upgrade project is well underway, and is expected to be completed by 30 June 2018.

New connections for network extensions are initiated by TDC, and the new connection is completed by Scanpower or Powerco. When a new subdivision is created an application is sent to TDC and planning approval is provided. Tararua Alliance monitors construction and once a code of compliance and "as built" plans are provided the lights are vested in Council and added to the RAMM database. There have been no new subdivisions in the past three years.

Scanpower, Powerco, and C & J Contractors invoice Tararua Alliance and provide supporting information which includes details of any maintenance, replacements, and new installations. Tararua Alliance uses this information to capitalise the assets and update RAMM. The timing of invoices can cause delays in updating the database, particularly where invoices are issued on completion of a project. Many of the differences found during the field audit related to the LED upgrade, where Tararua Alliance has not received invoices for all work completed. This is recorded as non-compliance below.

Festive lighting is used in Woodville and Dannevirke but Tararua Alliance advised it is connected to shops' electricity supplies not streetlight circuits. This lighting is not included in the database.

Tararua Alliance is not aware of any private unmetered lights.

NZTA lights are recorded in the database, but NZTA does not provide information when lights are added or changed. Only work invoiced to TDC is updated in the database. I recommend that TDC works with NZTA to either hand over responsibility for maintaining a database of the NZTA lights in the TDC area or establish processes to ensure the light details are up to date in the TDC database.

Description	Recommendation	Audited party comment	Remedial action
Tracking of load changes	Work with NZTA to either: 1. Hand over responsibility for maintaining a database of NZTA lights in the TDC area; or 2. Establish a process to ensure that NZTA light information is maintained in the TDC database.	Contact will seek to facilitate a discussion between Tararua DC and NZTA regarding a way forward for NZTA lights installed on council maintained roads	Investigating

Tararua Alliance completes checks of database accuracy and updates the database once any work required is complete.

- In the towns, lights are checked for outages as part of the daily road sweeping process.
- Each summer, lenses are cleaned and the lights are inspected.
- Each winter, lights are checked to confirm they are working.

Database accuracy is discussed in **section 3.1**. Once database accuracy is confirmed and used for submission by Contact, I recommend that Tararua Alliance should ensure the database is up to date before providing the monthly reports.

Description	Recommendation	Audited party comment	Remedial action
Tracking of load changes	Ensure that all database changes are processed prior to providing database reports to Contact each month.	Contact will work with Tararua Alliance to undertake the required updates in a timely manner	Identified

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.6 With: Clause 11(3) of Schedule 15.3 From: unknown To: 08-May-18	Updates to the database can be delayed. Potential impact: Medium Actual impact: Low Audit history: Twice previously Controls: Weak Breach risk rating: 3
Audit risk rating	**Rationale for audit risk rating**
Low	Controls are rated as weak, as they are not sufficient to ensure that the database is kept up to date where invoicing is not timely. The impact is low, because the current database is not used for reconciliation submissions. If the database was used, the potential impact during the LED upgrade period is estimated to be medium.

Actions taken to resolve the issue	Completion date	Remedial action status
Tararua Alliance on behalf of Tararua DC have committed to updating the database with correct wattage values and descriptions during May 2018. Tararua DC is keen to see the benefit of lower consuming LED lights in their power costs so there is incentive to ensure regular updates of the database is undertaken	July 2018	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
As above	As above	

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 RAMM database contains 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	TDC region
Strata	The database contains items of load in Tararua area. The processes for the management of all items of load are the same; there is not a separate process for NZTA lights. The sample was selected from two strata: • NZTA; and • All other light owners.
Area units	I created a pivot table of the roads and I used a random number generator in a spreadsheet to select a total of 18 sub-units.
Total items of load	151 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 Veritek, or the manufacturer's specifications.

Audit commentary

The database was found to contain some inaccuracies.

The field audit found:

- eight more lamps in the field than were recorded in the database.
- 65 lamp type and wattage differences.

The field data was 69.5% of the database data for the sample checked. The total wattage recorded in the database for the sample was 10,430 watts. The total wattage found in the field for the sample checked was 7,249 watts, a difference of 3,181 watts or over recording of 13,586 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).

Some database content issues were identified:

- ICP numbers are not recorded for 208 items of load, as discussed in **section 2.2**.

- Three lamp types were recorded incorrectly.

Recorded Lamp Type	Correct Lamp Type	Count
135W High Pressure Sodium Vapour	135W Low Pressure Sodium	31
80W High Pressure Sodium Vapour	80W Mercury Vapour	1
90W High Pressure Sodium Vapour	90W Low Pressure Sodium	4
	Total	**36**

- Six items of load had missing make, model, lamp wattage, and/or gear wattage. A further 168 items of load were expected to have a gear wattage recorded, but the gear wattage was blank. The expected gear wattage for these items was 2,915 watts or approximately 12,450 kWh per annum. The missing information is discussed in **section 2.4**.
- The table below shows the 539 items with incorrect gear wattages recorded in red. The database gear wattage for the affected items was 16,140 watts but was expected to be 8,379 watts. The difference is 7761 watts or approximately 33,147 kWh per annum. Almost all lamps are expected to be replaced with LEDs by 30 June 2018, which will have gear wattages of zero. Where populated, lamp wattages were correctly recorded.

	Count of items with gear wattage							
Model	0 W	70 W	90 W	100 W	135 W	150 W	Expected value	Comment
100W High Pressure Sodium Vapour	16			6			14 W	
135W High Pressure Sodium Vapour	7				24		36 W	Expected to be low pressure sodium
135W Low Pressure Sodium	1						36 W	
150W High Pressure Sodium						1	18 W	
150W High Pressure Sodium Vapour	33					26	18 W	
250W High Pressure Sodium Vapour	26						28 W	
60W High Pressure Sodium Vapour	2						14	
70W High Pressure Sodium Vapour	278	103					13	
80W Mercury Vapour	1						10	

	Count of items with gear wattage							
Model	0 W	70 W	90 W	100 W	135 W	150 W	Expected value	Comment
90W High Pressure Sodium Vapour	1		3				30	Expected to be low pressure sodium
Betacom 27w led		11					0	

Tararua Alliance intends to correct the incorrect wattages during May 2018.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: unknown To: 08-May-18	The database contains some incorrect and missing information. • Database accuracy is assessed to be 69.5% indicating over recording of approximately 13,586 kWh per annum. • 208 items of load have no ICP number recorded. 38,468 watts or approximately 164,296 kWh are recorded in the database for items of load with no ICP number. • Six items of load do not have complete and accurate description and load information recorded, and the wattage is unknown. A further 168 items of load are expected to have a gear wattage recorded, but the gear wattage is blank. The expected gear wattage for these items is 2,915 watts or approximately 12,450 kWh per annum. • 539 items have incorrect gear wattages recorded. The difference is 7761 watts or approximately 33,147 kWh per annum over recorded in the database. Potential impact: High Actual impact: Medium Audit history: None Controls: Weak Breach risk rating: 6

Audit risk rating	Rationale for audit risk rating
Medium	The controls are rated as weak, because they are not sufficient to ensure that the database is correct. The potential impact is assessed to be high, based on the kWh differences described above. The actual impact is assessed to be medium because • The May 2017 database used to calculate submissions was out of date. Based on review of the current database in **section 3.1**, it appears likely that the May 2017 database version used for submission also contained some inaccurate information. • The impact is reduced because Contact adjusted the May 2017 database information to include missing ICP numbers and correct wattages.

Actions taken to resolve the issue	Completion date	Remedial action status
Tararua Alliance have committed to ensuring all ICP, ballast value and LED upgrades are updated within the database on Tararua DC's behalf during May 2018. Once this has been completed Contact will review the database accuracy again against the field audit results.	July 2018	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
As above	As above	

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

Contact reconciles this DUML load using the HHR profile, in accordance with exemption number 177. This exemption is discussed further in **section 1.1**.

Until April 2018, regular reports from the database were not provided. Submissions were based on historic database information provided in May 2017, with on and off times derived from data logger

information. Contact filled gaps in the May 2017 data like missing ICPs and missing and incorrect wattage information.

I recalculated the submissions for March 2018 for all four ICPs using the March 2018 data logger information and the May 2017 database information corrected by Contact, and found that the calculation was correct.

ICP	Actual Submission March 2018	Recalculated Submission based on May 2017 data	Difference
0009100000CADDC	15,977.99	15,977.99	-
0009101000CAC7C	5,620.96	5,620.96	-
0009102000CAE9C	6,957.34	6,957.34	-
1000554957PC423	10,788.27	10,788.27	-
Total	**39,344.56**	**39,344.56**	**-**

I also recalculated the March 2018 submission based on the database provided during April 2018 and the March 2018 data logger hours. I found that the difference in submission was 11,315 kWh.

ICP	Actual Submission March 2018	Recalculated submission based on April 2018 database	Difference
0009100000CADDC	15,977.99	17,813.93	1,835.94
0009101000CAC7C	5,620.96	1,422.41	-4,198.55
0009102000CAE9C	6,957.34	4,500.02	-2,457.32
1000554957PC423	10,788.27	4,294.34	-6,493.93
Total	**39,344.56**	**28,030.71**	**-11,313.85**

It is difficult to assess the accuracy of the submission information, for several reasons:

- There are some issues with the accuracy of the data provided in April 2018 which are recorded as non-compliance and discussed in **sections 2.2**, **2.4**, **2.5**, **2.6** and **3.1**. Contact intends to work with Tararua Alliance to resolve these issues and then migrate to using the monthly submission data. Updated data will be used for revision submissions where available.
- An LED upgrade is in progress which has resulted in rapid changes to the lamps installed. The data provided in April 2018 may not reflect what was installed in March 2018.
- Contact filled gaps in the May 2017 data like missing ICPs and missing and incorrect wattage information.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: unknown To: 08-May-18	The database used to prepare submissions is out of date. Potential impact: Medium Actual impact: Unknown Audit history: Twice previously Controls: Weak Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
Medium	The controls are rated as weak overall. The database used to calculate submissions was out of date. Based on review of the current database in **section 3.1**, it appears likely that the May 2017 database version used for submission also contained some inaccurate information. The impact is assessed to be medium, based on the kWh differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
Tararua Alliance have committed to ensuring all ICP, ballast value and LED upgrades are updated within the database on Tararua DC's behalf during May 2018. Once this has been completed Contact will review the database accuracy again against the field audit results. Tararua DC is keen to see the benefit of lower consuming LED lights in their power costs so there is incentive to ensure regular updates of the database is undertaken	July 2018	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
As above	As above	

CONCLUSION

Tararua Alliance maintains streetlight information in TDC's RAMM database.

New connection, fault, maintenance and upgrade work is completed by Scanpower for lights on the Scanpower Network, and Powerco on the Powerco Network. C & J Contractors also complete some maintenance work. An LED upgrade project is well underway, and is expected to be completed by 30 June 2018. TDC does not intend to use a centralised management system.

Scanpower, Powerco, and C & J Contractors invoice Tararua Alliance and provide supporting information which includes details of any maintenance, replacements and new installations. Tararua Alliance uses this invoice information to update RAMM.

NZTA lights are recorded in the database, but NZTA does not provide information when lights are added or changed. Only work invoiced to TDC is updated in the database.

Historically there has not been regular reporting from the database to Contact. Contact's submissions have been based on data provided in May 2017. Contact filled gaps in the data like missing ICPs (based on location) and missing and incorrect wattage information (based on the light makes and models recorded).

A report from RAMM was provided by Tararua Alliance in April 2018, and they intend to supply monthly reports to Contact from now on. There are some issues with the accuracy of the data provided, and Contact intends to work with Tararua Alliance to resolve these issues and then migrate to using the monthly submission data. Once accuracy is confirmed, updated data will be used for revision submissions where available.

Tararua Alliance have indicated that they want to resolve these issues, and improve the accuracy of their database.

The future risk rating of 33 indicates that the next audit be completed in 3 months. I recommend that the next audit date should be in at least six months, to allow time for the LED upgrade to be completed and the database accuracy issues to be resolved. Seven non-compliances were identified, and four recommendations were raised.

PARTICIPANT RESPONSE

Contact acknowledges the lack of interaction between Tararua DC's agent Tararua Alliance has resulted in a higher number of non compliances for a relatively small DUML database owner.

Contact is encouraged by Tararua Alliance's commitment to quickly addressing the database updates that will allow Tararua DC to begin to receive the benefit of the lower consuming LED lights that are currently being installed in their jurisdiction.

Once a complete and accurate database extract has been provided at the end of May 2018 we expect to improve the settlement accuracy of this DUML load into the market.