ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

NEW PLYMOUTH DISTRICT COUNCIL AND CONTACT ENERGY LIMITED

NZBN: 9429038549977

Prepared by: Steve Woods

Date audit commenced: 14 September 2021

Date audit report completed: 25 November 2021

Audit report due date: 1 December 2021

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EXECUTIVE SUMMARY

This audit of the **New Plymouth District Council (NPDC)** DUML database and processes was conducted at the request of **Contact Energy Limited (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. The scope of the audit encompasses the collection, security and accuracy of the data, including the preparation of submission information.

Streetlight load is determined by wattages held within NPDC's RAMM database. Fault, maintenance and upgrade work is managed by NPE Tech. The database is updated in the field using PDAs, or from the office by the NPE Tech administration team.

Contact reconciles this DUML load using the DST profile. Monthly wattage reports are provided by Power Solutions to Contact Energy. Data logger information and on and off times are derived from data logger information. I reviewed the submission information for July 2021 and confirmed that it was calculated accurately based on the database.

The field audit found that in absolute terms, total annual consumption is estimated to be 20,800 kWh lower than the DUML database indicates.

Festive lights have been largely decommissioned. Any remaining festive lights have been added to the RAMM database under ICPs 1000542569PC16D and 1000542572PC514. The monthly report confirms whether these lights are on or off.

As reported in the last audit, there were 76 private streetlights (4,961 W) that did not have a valid ICP number recorded. Some of these were expected to be metered through the customer's installation or to have standard unmetered load created by the network. 14 of the 76 lights have standard unmetered load ICPs. The remaining 62 are in private subdivisions, retirement villages, holiday parks or within the area owned by the Port. These lights are unlikely to meet the definition of "shared unmetered load" because this definition is as follows:

"shared unmetered load means unmetered load at a single point of connection that is distributed across more than one ICP"

And the definition of a "point of connection" is as follows:

"point of connection means a point at which electricity may flow into or out of a network"

In most cases, it is unlikely there will be a single point of connection to Powerco's network for these private lights. This situation is becoming more common as Councils are no longer managing private lights, and the Code is not clear on responsibilities for these lights or how to resolve this situation. I have therefore raised this as an issue.

On 18 June 2019, the Electricity Authority issued a memo clarifying the memo of 2012 that stated that a monthly snapshot was sufficient to calculate submission from, and confirmed the code requirement to calculate the correct monthly load must:

- take into account when each item of load was physically installed or removed, and
- wash up volumes must take into account where historical corrections have been made to the DUML load and volumes.

The current monthly report is provided as a snapshot and is non-compliant, and Contact completes revision submissions where corrections are required. Contact is not receiving daily capacity values to enable compliance to be achieved with the requirement outlined in the Authority's memo.

The future risk rating of Fourteen indicates that the next audit be completed in 12 months. I have taken this into consideration along with Contact's comments and agree with this recommendation.

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 field audit found that in absolute terms, total annual consumption is estimated to be 20,800 kWh lower than the DUML database indicates. Three lights recorded against the incorrect NSP. Nine incorrect gear wattages. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.	Moderate	Medium	4	Identified
All load recorded in database	2.5	11(2A) of Schedule 15.3	For the sample of lights checked, there were eight additional lights found in the field.	Moderate	Low	2	Disputed
Database accuracy	3.1	15.2 and 15.37B(b)	The field audit found that in absolute terms, total annual consumption is estimated to be 20,800 kWh lower than the DUML database indicates. Nine incorrect gear wattages. Three lights recorded against the incorrect ICP.	Moderate	Medium	4	Identified
Volume information accuracy	3.2	15.2 and 15.37B(c)	The field audit found that in absolute terms, total annual consumption is estimated to be 20,800 kWh lower than the DUML database indicates. Three lights recorded against the incorrect NSP. Nine incorrect gear wattages. The monthly database extract provided does not track changes at a daily	Moderate	Medium	4	Identified

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
			basis and is provided as a snapshot.				
Future Risk Rating						14	

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
Database accuracy	3.1	Confirm the correct lamp and gear wattages for the potential discrepancies described in **section 3.1**.

ISSUES

Subject	Section	Description	Issue
Private lights	3.1	62 private lights are not included in submission calculations. It is not clear who is responsible and how this matter should be resolved. The under submission is approx. 16,000 kWh per annum.	Guidance from the Electricity Authority is required.

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. Persons involved in this audit

Auditor:

Steve Woods

Veritek Limited

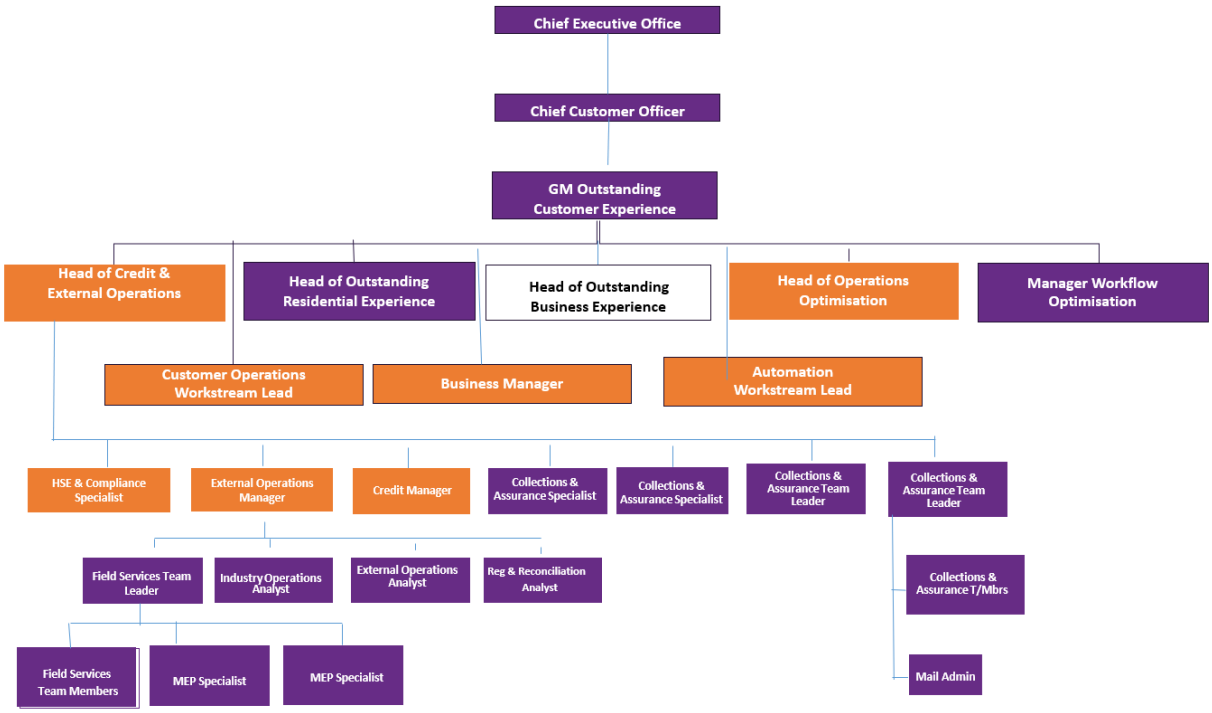
Electricity Authority Approved Auditor

Other personnel assisting in this audit were:

Name	Title	Company
John Eagles	Network Management Lead - Transportation	New Plymouth District Council
Luke Cartmell-Gollan	Commercial Operations Manager	Contact Energy

1.3. Structure of Organisation

Contact provided a copy of their organisational structure.



1.4. Hardware and Software

RAMM

The SQL database used for the management of DUML is remotely hosted by thinkproject New Zealand Limited (formerly RAMM NZ 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.

thinkproject New Zealand Limited backs up the database and assists with disaster recovery as part of their hosting service. Nightly backups are performed. As a minimum, daily backups are retained for the previous five working days, weekly backups are retained for the previous four weeks, and monthly backups are retained for the previous six months.

Access to the database is secure by way of password protection.

Systems used by the trader to calculate submissions are assessed as part of their reconciliation participant audits.

Festive lights

Festive lights have been largely decommissioned. Any remaining festive lights have been added to the RAMM database under ICPs 1000542569PC16D and 1000542572PC514. The monthly report confirms whether these lights are on or off.

1.5. Breaches or Breach Allegations

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

1.6. ICP Data

All load is recorded against an ICP in the NPDC RAMM database. All the decommissioned ICPs have been removed from the database so Contact Energy no longer have to aggregate the information to the active ICPs. The festival lights were recorded separately in an Excel spreadsheet. Any remaining festive lights **have been** added to the RAMM database under ICPs 1000542569PC16D and 1000542572PC514.

ICP Number	Description	ICP status	NSP	Profile	Number of items of load	Database wattage (watts)
0008807417WMB53	STREETLIGHTS NEW PLYMOUTH DISTRICT COUNCIL TONGAPORUTU	2,0	HTI0331	DST	5	105
1000542569PC16D	NPDC Roading SL - TARAHUA ROAD	2,0	CST0331	DST	6,828	230,570
1000542572PC514	NPDC Roading SL - Waitara Road	2,0	HUI0331	DST	2,003	59,642
1000542575PC8DE	NPDC Roading SL - EAST ROAD	2,0	SFD0331	DST	3	63
Total					**10,101**	**290,200**

The volumes associated with the NPDC RAMM database have reduced in number during the audit period as the NZTA lights are now reconciled in an NZTA RAMM database which is being audited separately.

1.7. Authorisation Received

All information was provided directly by Contact or NPDC.

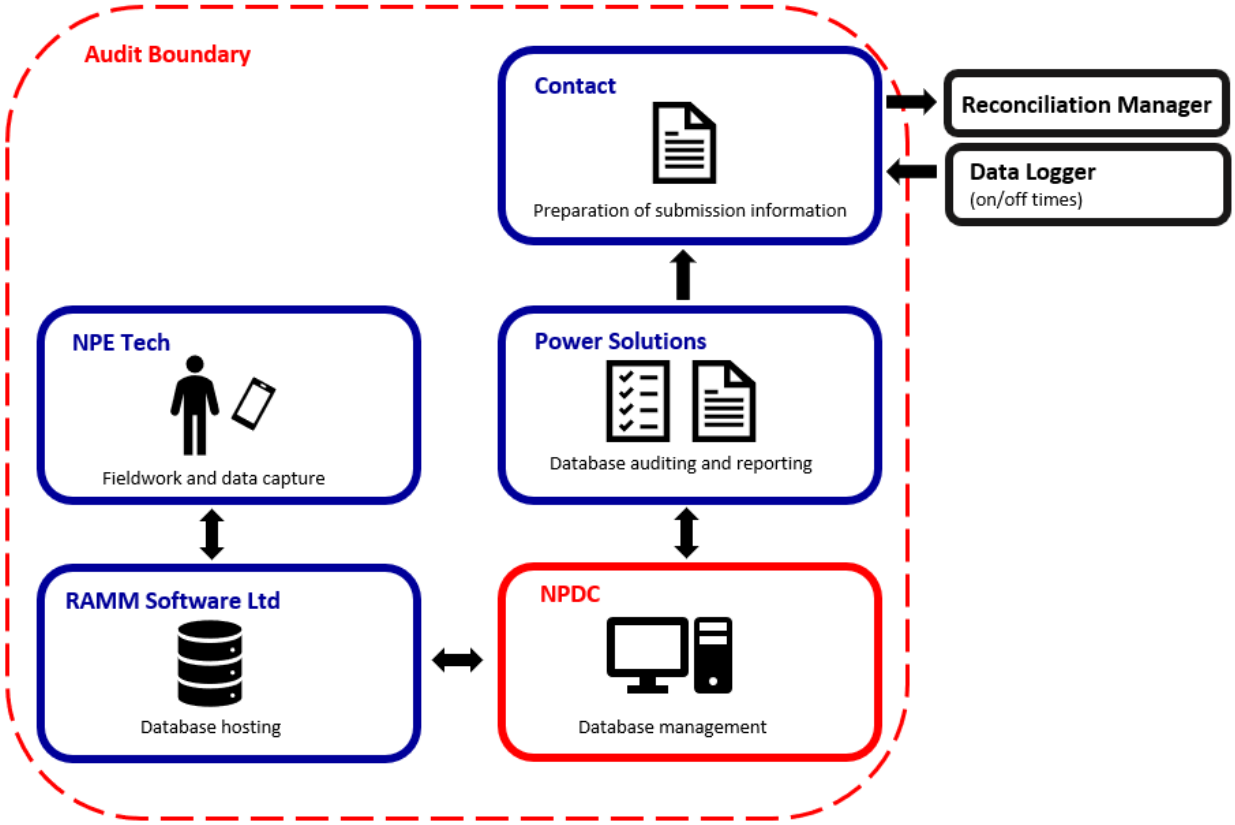
1.8. Scope of Audit

This audit of the NPDC DUML database and processes was conducted at the request of 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.

Streetlight load is determined by wattages held within NPDC's RAMM database. Fault, maintenance and upgrade work is managed by NPE Tech. The database is updated in the field using PDAs, or from the office by the NPE Tech administration team. Power Solutions Limited provides monthly reports from RAMM to Contact, including private and NZTA lighting.

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.



The field audit was undertaken of a statistical sample of 311 items of load on 20 September 2021.

1.9. Summary of previous audit

The previous audit of this database was undertaken by Tara Gannon of Veritek Limited in November 2019. The summary table below shows the statuses of the non-compliances and recommendation raised in the previous audit. Further comment is made in the relevant sections of this report.

Table of Non-compliance

Subject	Section	Clause	Non-compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	Four lights recorded against the incorrect NSP. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. Livening dates are recorded as the installation date for new connections and change dates may not reflect the date of the change if they are not processed in RAMM at the time that the change occurs.	Still existing Still existing Cleared
All load recorded in database	2.5	11(2A) of Schedule 15.3	For the sample of lights checked, there were three additional lights found in the field.	Still existing for different lights
Database accuracy	3.1	15.2 and 15.37B(b)	Four lights recorded against the incorrect ICP. Livening dates are recorded as the installation date for new connections and change dates may not reflect the date of the change if they are not	Still existing Cleared

Subject	Section	Clause	Non-compliance	Status
			processed in RAMM at the time that the change occurs.	
Volume information accuracy	3.2	15.2 and 15.37B(c)	An incorrect profile is recorded on the registry for 0008807417WMB53. Four lights recorded against the incorrect NSP. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. Livening dates are recorded as the installation date for new connections and change dates may not reflect the date of the change if they are not processed in RAMM at the time that the change occurs.	Cleared Cleared Still existing Cleared

Table of Recommendations

Subject	Section	Recommendation	Status
Deriving submission information	2.1	Confirm with the network that private lights are being reconciled elsewhere.	Raised as an issue
Database accuracy	3.1	Confirm the correct lamp and gear wattages for the potential discrepancies described in **section 3.1**.	Still existing
Database accuracy	3.1	Check ICP number assignment for streets which unexpectedly have lights connected to more than one NSP.	Recorded as non-compliance

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.

Audit outcome

Compliant

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 and the application of profiles was checked. The database was checked for accuracy.

Audit commentary

Contact reconciles this DUML load using the DST profile. Monthly wattage reports are provided by Power Solutions to Contact Energy. Data logger information and on and off times are derived from data logger information. I reviewed the submission information for July 2021 and confirmed that it was calculated accurately based on the database.

Festive lights have been largely decommissioned. Any remaining festive lights have been added to the RAMM database under ICPs 1000542569PC16D and 1000542572PC514. The monthly report confirms whether these lights are on or off.

Examination of the database found:

Issue	Estimated volume information impact (annual kWh)
The field audit found that in absolute terms, total annual consumption is estimated to be 20,800 kWh lower than the DUML database indicates	Under submission of 20,800 kWh per annum
Three lights connected to the incorrect ICP	No impact on submission
Nine incorrect gear wattages	Over submission of 55 kWh per annum

As reported in the last audit, there were 76 private streetlights (4,961 W) that did not have a valid ICP number recorded. Some of these were expected to be metered through the customer's installation or to have standard unmetered load created by the network. 14 of the 76 lights have standard unmetered load ICPs. The remaining 62 are in private subdivisions, retirement villages, holiday parks or within the area owned by the Port. These lights are unlikely to meet the definition of "shared unmetered load" because this definition is as follows:

"shared unmetered load means unmetered load at a single point of connection that is distributed across more than one ICP"

And the definition of a "point of connection" is as follows:

"point of connection means a point at which electricity may flow into or out of a network"

In most cases, it is unlikely there will be a single point of connection to Powerco's network for these private lights. This situation is becoming more common as Councils are no longer managing private lights, and the Code is not clear on responsibilities for these lights or how to resolve this situation. I have therefore raised this as an issue in **section 3.1.**

On 18 June 2019, the Electricity Authority issued a memo clarifying the memo of 2012 that stated that a monthly snapshot was sufficient to calculate submission from, and confirmed the code requirement to calculate the correct monthly load must:

- take into account when each item of load was physically installed or removed, and
- wash up volumes must take into account where historical corrections have been made to the DUML load and volumes.

As reported in the last audit, the current monthly report is provided as a snapshot and this practice is non-compliant. When a wattage is changed in the database due to a physical change or a correction, only the record present at the time the report is run is recorded, not the historical information showing dates of changes. Contact completes revision submissions where corrections are required. Contact is not receiving daily capacity values to enable compliance to be achieved with the requirement outlined in the Authority's memo.

The RAMM database records an installation date, which typically records the livening date for the light. There is no separate livening date.

Change dates are automatically generated by RAMM when records change; but cannot be selected by the user. Where a change is entered using Pocket RAMM at the time of the change, this date will reflect the correct date on which the change occurred, however if a change or correction is processed by NPE Tech administration staff at a later date, the change date may be incorrect.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 01-Oct-20 To: 04-Nov-21	The field audit found that in absolute terms, total annual consumption is estimated to be 20,800 kWh lower than the DUML database indicates. Three lights recorded against the incorrect NSP. Nine incorrect gear wattages. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. Potential impact: Medium Actual impact: Medium Audit history: Multiple times Controls: Moderate Breach risk rating: 4
Audit risk rating	**Rationale for audit risk rating**
Medium	Controls are rated as moderate, as they are sufficient to mitigate the risk most of the time but there is room for improvement. The impact is assessed to be medium based on the potential over submission of 20,800 kWh per annum.

Actions taken to resolve the issue	Completion date	Remedial action status

This finding in the field audit was the result of Powerco changing poles and removing lights without communicating with NPDC until after the work is done. As such, these lights continue to be reconciled until such time as Council is made aware of the change. Lights recorded against the incorrect ICP will be corrected. Incorrect gear wattages will be corrected.	N/a 30/11/2021 30/11/2021	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
We will continue to work with Powerco to tighten this process and ensure that timely communication is received, preferably in advance of any decommission. NPDC and providers Power Solutions will work on developing a new report out of RAMM that provides a daily capacity value for the purpose of billing and submission.	Ongoing 31/3/2022	

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 was recorded against each item of load.

Audit commentary

The analysis found that all items of load had ICP numbers recorded against them.

Where private lights connected to streetlight circuits are identified, they are recorded in RAMM and assigned to one of the "private" ICP groups. These groups are included in the report to Contact but excluded from submission information. This is raised as an issue in **section 3.1**.

ICP number accuracy is discussed in **sections 2.1** and **3.1**.

Audit outcome

Compliant

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 fields for road names, house numbers, pole numbers and GPS coordinates. 9,674 (98%) of lamps have GPS coordinates recorded. The lamps without GPS coordinates all have sufficient road name, pole number, distance from the end of the road and/or house number information recorded to enable them to be located.

Audit outcome

Compliant

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

Code reference

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

Code related audit information

The DUML database must contain:

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

Audit observation

The database was checked to confirm that:

- it contained a field for light type and wattage capacity,
- wattage capacities include any ballast or gear wattage, and
- each item of load has a light type, light wattage, and gear wattage recorded.

Audit commentary

The database contains fields for lamp make and model, lamp wattage and gear wattage.

No lamp wattages were invalidly recorded as zero.

The accuracy of the recorded wattages is discussed in **section 3.1**.

Audit outcome

Compliant

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

Code reference

Clause 11(2A) of Schedule 15.3

Code related audit information

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

Audit observation

The field audit was undertaken of a statistical sample of 311 items of load on 20 September 2021. The sample was selected from four strata, as follows:

1. Road name A-De,

2. Road name Di-L,
3. Road name M-Q, and
4. Road name R-Y.

Audit commentary

The field audit discrepancies are summarised in the table below.

Discrepancy	Quantity	Comments
Additional lights	8	Mostly newly installed lights on Papawhero Drive, where vesting has not occurred.
Incorrect wattage	17	Mostly Italo 1 lights with 69.5 watts in the database but the label has 68 watts.
Lights in the database missing from the field	3	

The details of each fitting have been supplied to NPDC and Contact.

Eight additional lights were found in the field. This is recorded as non-compliance above.

Database accuracy is detailed in **section 3.1**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3 From: 01-Sep-20 To: 04-Nov-21	For the sample of lights checked, there were eight additional lights found in the field. Potential impact: Low Actual impact: Low Audit history: Twice previously Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	Controls are rated as moderate, the process in place has sufficient controls to ensure that all items of load are recorded in the database most of the time, but improvements are required to the new connection processes. The audit risk rating is assessed to be low because the impact on submission is only 61 kWh per month.

Actions taken to resolve the issue	Completion date	Remedial action status
We do not believe these lights are the responsibility of the Council and therefore should not be considered as part of this audit. As these lights are currently private lights we believe that they should be reconciled by the Developer and their retailer via a BTS or similar. Only when they are vested to Council, and become the responsibility of Council should they be considered within scope of this audit. Further to this, the livening of these assets was completed by Powerco and the developer and neither Contact nor NPDC were involved.	N/a	Disputed Post audit auditor comment. The reason for recording non-compliance is that the load at the ICP Contact is responsible for has changed without a change to the database. Clause 10.33A stipulates that the trader is the only party authorized to electrically connect a point of connection, therefore Powerco is electrically connecting the streetlight circuit as an agent to Contact.
Preventative actions taken to ensure no further issues will occur	**Completion date**	

2.6. Tracking of load changes (Clause 11(3) of Schedule 15.3)

Code reference

Clause 11(3) of Schedule 15.3

Code related audit information

The DUML database must track additions and removals in a manner that allows the total load (in kW) to be retrospectively derived for any given day.

Audit observation

The process for tracking of changes in the database was examined.

Audit commentary

The change management process and the compliance of the database reporting provided to Contact is detailed in **sections 3.1** and **3.2**.

The RAMM database functionality achieves compliance with the code.

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

RAMM

The database has a complete audit trail.

Festival lights

Festive lights have been largely decommissioned. Any remaining festive lights have been added to the RAMM database under ICPs 1000542569PC16D and 1000542572PC514. The monthly report confirms whether these lights are on or off.

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

Contact's submissions are based on a monthly extract from the RAMM database. A RAMM database extract was provided for July 2021, and I assessed the accuracy of this by using the DUML Statistical Sampling Guideline. The table below shows the survey plan.

Plan Item	Comments
Area of interest	New Plymouth District Council streetlights
Strata	The database contains the NPDC items of load for the DUML ICPs in the New Plymouth Region. The processes for the management of all NPDC items of load are the same, but I decided to place the items of load into four strata: 1. Roads A-De, 2. Roads Di-L, 3. Roads M-Q, and 4. Roads R-Y.
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 33 sub-units.
Total items of load	311 items of load were checked, making up 3% of the total database wattage.

Wattages were checked for alignment with the published standardised wattage table produced by the Electricity Authority against the database or in the case of LED lights against the LED light specification.

The change management process and timeliness of database updates was evaluated.

Audit commentary

Field audit findings

A field audit was conducted of a statistical sample of 311 items of load. The "database auditing tool" was used to analyse the results, which are shown in the table below.

Result	Percentage	Comments
The point estimate of R	98.3	Wattage from survey is lower than the database wattage by 1.7%
R_L	91.3	With a 95% level of confidence, it can be concluded that the error could be between -8.7% and +7.5%
R_H	107.5	

These results were categorised in accordance with the "Distributed Unmetered Load Statistical Sampling Audit Guideline", effective from 1 February 2019. The table below shows that Scenario C (detailed below) applies.

The conclusion from Scenario C is that the variability of the sample results across the strata means that the true wattage (installed in the field) could be between 8.7% lower and 7.5% higher than the wattage recorded in the DUML database. Non-compliance is recorded because the potential error is greater than 5.0%.

In absolute terms the installed capacity is estimated to be 5kW lower the database indicates.

There is a 95% level of confidence that the installed capacity is between 25 kW lower to 22 kW higher than the database.

In absolute terms, total annual consumption is estimated to be 20,800 kWh lower than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 108,200 kWh lower and 93,100 kWh p.a. higher than the database indicates.

Scenario	**Description**
A - **Good accuracy, good precision**	This scenario applies if: (a) R_H is less than 1.05; and (b) R_L is greater than 0.95 The conclusion from this scenario is that: (a) the best available estimate indicates that the database is accurate within +/- 5 %; and (b) this is the best outcome.
B - **Poor accuracy, demonstrated with statistical significance**	This scenario applies if: (a) the point estimate of R is less than 0.95 or greater than 1.05 (b) as a result, either R_L is less than 0.95 or R_H is greater than 1.05. There is evidence to support this finding. In statistical terms, the inaccuracy is statistically significant at the 95% level
C - **Poor precision**	This scenario applies if: (a) the point estimate of R is between 0.95 and 1.05 (b) R_L is less than 0.95 and/or R_H is greater than 1.05 The conclusion from this scenario is that the best available estimate is not precise enough to conclude that the database is accurate within +/- 5 %

Light description and capacity accuracy

As discussed in **section 2.4**, all lights have a lamp and gear wattage recorded. Lamp and gear wattages were compared to the expected values.

Nine items of load have incorrect gear wattages. The details have been supplied to NPDC and Contact. The impact on submission is only 55 kWh per annum.

During the previous audit, 515 potential wattage discrepancies were identified, and specifications were requested to confirm that the correct wattage values had been recorded in the database. These were provided to NPDC to confirm that the correct wattage has been applied but no further updates have been provided and the same discrepancies exist. Further analysis was conducted during this audit and some of the expected lamp wattages have been updated. The table below shows the details. There are still 480 potential discrepancies.

Lamp make model	Qty	Database lamp wattage	Expected lamp wattage	Database gear wattage	Expected gear wattage
3202 Lucerna LED	8	30	33 or 43	0	0
ITALO 1 STAN1 4.7-4M	245	69.5	67.5	0	0
ITALO 2 STAN1 4.5-7M	130	94	88	0	0
LED Ropelight	1	10	Unknown	0	0
LED Stela Long 14NRN	54	21	Unknown	0	0
SPWP-24-50 RGBW 30 Degree Spot	16	50	Unknown	0	0
11W Compact Fluorescent	25			0	Unknown
18W Compact Fluorescent	1			0	2

Recommendation	Description	Audited party comment	Remedial action
Database Accuracy	Confirm the correct lamp and gear wattages for the potential discrepancies described in **section 3.1**.	NPDC have received the template spec sheets from Veritek and before making changes will validate this from the spec sheets they received at the time of install. If RAMM is recorded incorrectly, it will be updated, otherwise further information will be provided back to Veritek.	Identified

ICP number accuracy

As reported in the last audit, there were 76 private streetlights (4,961 W) that did not have a valid ICP number recorded. This is discussed below under private lights.

In the last audit, the auditor found two streets (three lights) below that are fed by one NSP therefore the highlighted cells indicate that these lights are recorded against the incorrect NSP and therefore ICP. These ICPs are in the same balancing area so there is no impact on submission. These lights are still recorded against the incorrect ICP. This is recorded as non-compliance.

Street	CST0331	HTI0331	HUI0331	SFD0331	Total
NELSON STREET	1		21		23
WEST QUAY	2		50		52

Change management process findings

Fault, maintenance and upgrade work is completed by NPE Tech. The RAMM database is either updated in the field using PDAs, or paper records are provided to the NPE Tech administration staff who update the database directly.

The ITS Contracts Manager – Transportation Team exports data from RAMM and validates changes to the database in the previous 90 days. This check includes identifying missing fields, and incorrect or inconsistent data including wattages, gear wattages, makes, and models. Power Solutions Limited also complete a monthly review of the data prior to reporting to Contact; and follow up any discrepancies with NPDC.

The process for new connections remains unchanged. NPDC is only responsible once the subdivision is "vested" in council. As soon as the electrical certificate is provided and the subdivision is complete, NPDC's development engineers check the lights and then advise NPE Tech to update the database. Development engineers regularly check new developments to monitor compliance and progress, which can help them to identify when streetlights are connected. In some cases, there may be a small delay between lights being connected and added to the database. NPDC notes that most subdivisions have less than 12 lights, and larger subdivisions are completed in stages, so the impact of any delays is minimal.

LED upgrades for NPDC lights have been completed.

The RAMM database records an installation date. This is the date of vesting to the council which is when NPDC have assumed responsibility of the light. This is expected to the same date as livening but if vesting is delayed and the Distributor has livened the streetlights no volume will be submitted for that period. Powerco are reviewing their streetlight connection process to close this gap.

As recorded in the last audit, the change dates are automatically generated by RAMM when records change but cannot be selected by the user. Where a change is entered using Pocket RAMM at the time of the change, this date will reflect the correct date on which the change occurred, however if a change or correction is processed by NPE Tech administration staff at a later date, the change date may be incorrect.

Outage patrols are conducted periodically. Reliance is placed on the faults process to identify issues with other lights.

Festive lights

Festive lights have been largely decommissioned. Any remaining festive lights have been added to the RAMM database under ICPs 1000542569PC16D and 1000542572PC514. The monthly report confirms whether these lights are on or off.

Private lights

As reported in the last audit, there were 76 private streetlights (4,961 W) that did not have a valid ICP number recorded. Some of these were expected to be metered through the customer's installation or to have standard unmetered load created by the network. 14 of the 76 lights have standard unmetered

load ICPs. The remaining 62 are in private subdivisions, retirement villages, holiday parks or within the area owned by the Port. These lights are unlikely to meet the definition of "shared unmetered load" because this definition is as follows:

"shared unmetered load means unmetered load at a single point of connection that is distributed across more than one ICP"

And the definition of a "point of connection" is as follows:

"point of connection means a point at which electricity may flow into or out of a network"

In most cases, it is unlikely there will be a single point of connection to Powerco's network for these private lights. This situation is becoming more common as Councils are no longer managing private lights, and the Code is not clear on responsibilities for these lights or how to resolve this situation. I have therefore raised this as an issue.

Issue	Description	Remedial action
Regarding clause 15.2 and 15.37B(b)	62 private lights are not included in submission calculations. It is not clear who is responsible and how this matter should be resolved. The under submission is approx. 16,000 kWh per annum	Guidance from the Electricity Authority is required.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 01-Oct-20 To: 04-Nov-21	The field audit found that in absolute terms, total annual consumption is estimated to be 20,800 kWh lower than the DUML database indicates. Nine incorrect gear wattages. Three lights recorded against the incorrect ICP. Potential impact: Medium Actual impact: Medium Audit history: Multiple times Controls: Moderate Breach risk rating: 4
Audit risk rating	**Rationale for audit risk rating**
Medium	Controls are rated as moderate, as they are sufficient to mitigate the risk most of the time but there is room for improvement. The impact is assessed to be medium based on the potential over submission of 20,800 kWh per annum.

Actions taken to resolve the issue	Completion date	Remedial action status

This finding in the field audit was the result of Powerco changing poles and removing lights without communicating with NPDC until after the work is done. As such, these lights continue to be reconciled until such time as Council is made aware of the change. Lights recorded against the incorrect ICP will be corrected. Incorrect gear wattages will be corrected.	N/a 30/11/2021 30/11/2021	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
We will continue to work with Powerco to tighten this process and ensure that timely communication is received, preferably in advance of any decommission.	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 the ICP has the correct profile and submission flag, and
- checking the database extract combined with the on hours against the submitted figure to confirm accuracy.

Audit commentary

Contact reconciles this DUML load using the DST profile. Monthly wattage reports are provided by Power Solutions to Contact Energy. Data logger information and on and off times are derived from data logger information. I reviewed the submission information for July 2021 and confirmed that it was calculated accurately based on the database.

Festive lights have been largely decommissioned. Any remaining festive lights have been added to the RAMM database under ICPs 1000542569PC16D and 1000542572PC514. The monthly report confirms whether these lights are on or off.

Examination of the database found:

Issue	Estimated volume information impact (annual kWh)
The field audit found that in absolute terms, total annual consumption is estimated to be 20,800 kWh lower than the DUML database indicates	Under submission of 20,800 kWh per annum
Three lights connected to the incorrect ICP	No impact on submission
Nine incorrect gear wattages	Over submission of 55 kWh per annum

As reported in the last audit, there were 76 private streetlights (4,961 W) that did not have a valid ICP number recorded. Some of these were expected to be metered through the customer's installation or to have standard unmetered load created by the network. 14 of the 76 lights have standard unmetered load ICPs. The remaining 62 are in private subdivisions, retirement villages, holiday parks or within the area owned by the Port. These lights are unlikely to meet the definition of "shared unmetered load" because this definition is as follows:

"shared unmetered load means unmetered load at a single point of connection that is distributed across more than one ICP"

And the definition of a "point of connection" is as follows:

"point of connection means a point at which electricity may flow into or out of a network"

In most cases, it is unlikely there will be a single point of connection to Powerco's network for these private lights. This situation is becoming more common as Councils are no longer managing private lights, and the Code is not clear on responsibilities for these lights or how to resolve this situation. I have therefore raised this as an issue in **section 3.1.**

On 18 June 2019, the Electricity Authority issued a memo clarifying the memo of 2012 that stated that a monthly snapshot was sufficient to calculate submission from, and confirmed the code requirement to calculate the correct monthly load must:

- take into account when each item of load was physically installed or removed, and
- wash up volumes must take into account where historical corrections have been made to the DUML load and volumes.

As reported in the last audit, the current monthly report is provided as a snapshot and this practice is non-compliant. When a wattage is changed in the database due to a physical change or a correction, only the record present at the time the report is run is recorded, not the historical information showing dates of changes. Contact completes revision submissions where corrections are required and have not yet updated their processes to be consistent with the Authority's memo.

The RAMM database records an installation date, which typically records the livening date for the light. There is no separate livening date.

Change dates are automatically generated by RAMM when records change; but cannot be selected by the user. Where a change is entered using Pocket RAMM at the time of the change, this date will reflect the correct date on which the change occurred, however if a change or correction is processed by NPE Tech administration staff at a later date, the change date may be incorrect.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: 01-Oct-20 To: 04-Nov-21	The field audit found that in absolute terms, total annual consumption is estimated to be 20,800 kWh lower than the DUML database indicates. Three lights recorded against the incorrect NSP. Nine incorrect gear wattages. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. Livening dates are recorded as the installation date for new connections and change dates may not reflect the date of the change if they are not processed in RAMM at the time that the change occurs. Potential impact: Low Actual impact: Low Audit history: Multiple times Controls: Moderate Breach risk rating: 4
Audit risk rating	**Rationale for audit risk rating**
Medium	Controls are rated as moderate, as they are sufficient to mitigate the risk most of the time but there is room for improvement. The impact is assessed to be medium based on the potential over submission of 20,800 kWh per annum.

Actions taken to resolve the issue	Completion date	Remedial action status
This finding in the field audit was the result of Powerco changing poles and removing lights without communicating with NPDC until after the work is done. As such, these lights continue to be reconciled until such time as Council is made aware of the change.	N/a	Identified
Lights recorded against the incorrect ICP will be corrected.	30/11/2021	
Incorrect gear wattages will be corrected.	30/11/2021	
Preventative actions taken to ensure no further issues will occur	**Completion date**	
We will continue to work with Powerco to tighten this process and ensure that timely communication is received, preferably in advance of any decommission.	Ongoing	
NPDC and providers Power Solutions will work on developing a new report out of RAMM that provides a daily capacity value for the purpose of billing and submission.	31/3/2022	

CONCLUSION

Streetlight load is determined by wattages held within NPDC's RAMM database. Fault, maintenance and upgrade work is managed by NPE Tech. The database is updated in the field using PDAs, or from the office by the NPE Tech administration team. Power Solutions Limited provides monthly reports from RAMM to Contact, including private and NZTA lighting.

Contact reconciles this DUML load using the DST profile. Monthly wattage reports are provided by Power Solutions to Contact Energy. Data logger information and on and off times are derived from data logger information. I reviewed the submission information for July 2021 and confirmed that it was calculated accurately based on the database.

The field audit found that in absolute terms, total annual consumption is estimated to be 20,800 kWh lower than the DUML database indicates.

Festive lights have been largely decommissioned. Any remaining festive lights have been added to the RAMM database under ICPs 1000542569PC16D and 1000542572PC514. The monthly report confirms whether these lights are on or off.

As reported in the last audit, there were 76 private streetlights (4,961 W) that did not have a valid ICP number recorded. Some of these were expected to be metered through the customer's installation or to have standard unmetered load created by the network. 14 of the 76 lights have standard unmetered load ICPs. The remaining 62 are in private subdivisions, retirement villages, holiday parks or within the area owned by the Port. These lights are unlikely to meet the definition of "shared unmetered load" because this definition is as follows:

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In most cases, it is unlikely there will be a single point of connection to Powerco's network for these private lights. This situation is becoming more common as Councils are no longer managing private lights, and the Code is not clear on responsibilities for these lights or how to resolve this situation. I have therefore raised this as an issue.

On 18 June 2019, the Electricity Authority issued a memo clarifying the memo of 2012 that stated that a monthly snapshot was sufficient to calculate submission from, and confirmed the code requirement to calculate the correct monthly load must:

- take into account when each item of load was physically installed or removed, and
- wash up volumes must take into account where historical corrections have been made to the DUML load and volumes.

The current monthly report is provided as a snapshot and is non-compliant, and Contact completes revision submissions where corrections are required. Contact is not receiving daily capacity values to enable compliance to be achieved with the requirement outlined in the Authority's memo.

The future risk rating of Fourteen indicates that the next audit be completed in 12 months. I have taken this into consideration along with Contact's comments and agree with this recommendation.

PARTICIPANT RESPONSE

NPDC has worked hard to ensure accuracy of their database over the past few years. Issues still exist with Lights being disconnected by field workers for Powerco managing power pole replacements that are not communicated, and this information flow will continue to be worked on. Additionally, the minor record keeping discrepancies noted in the audit will be reviewed and resolved (where required) as soon as possible. Work will also be undertaken to determine what is required to shift the monthly reporting from a snapshot, to a daily capacity value with a view to implement that in 2022.