# ELECTRICITY INDUSTRY PARTICIPATION CODE
# DISTRIBUTED UNMETERED LOAD AUDIT REPORT

For

## TAUPO DISTRICT COUNCIL
## AND TRUSTPOWER

Prepared by: Rebecca Elliot

Date audit commenced: 30 April 2019

Date audit report completed: 22 May 2019

Audit report due date: 1 June 2019

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## EXECUTIVE SUMMARY

This audit of the Taupo District Council (TDC) DUML database and processes was conducted at the request of Trustpower (Trustpower) in accordance with clause 15.37B. The purpose of this audit is to verify that the volume information is being calculated accurately, and that profiles have been correctly applied.

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

This database is switching from Trustpower to Meridian on June 30th,2019.

TDC use a RAMM database to manage this DUML load. New connection, fault and maintenance work is completed by Horizons. Monthly reports are received by Trustpower and Trustpower uploads any changes made during the month to their own internal database.

The LED rollout underway is being undertaken by Downer. This is expected to be completed for the P classified roads in June 2019. The V classified roads are about to go out to tender and once the contract is awarded the programme of work will be confirmed.

TDC continue to review and improve their database management processes. This is evident with the correcting ballasts, assignment of ICPs to all but three items of load. The overall database accuracy was found to be high and well within the +/- 5% variance threshold.

As was found in the last two audits, from analysis of the volumes submitted by Trustpower and the database extract, these are not aligned. This is for three reasons:

1. The incorrect wattage figure has been used from the monthly wattage report since January 2019. Trustpower update their own internal database from the monthly wattage report and the incorrect column of figures has been used to do this. This will be corrected through the revision process.
2. The monthly wattage report provided by TDC contains incorrect ballasts. Previously these were being corrected outside of RAMM but Trustpower started using the TDC wattage report figures from January 2019 and this contained the old ballasts.
3. TDC are excluding 351 items of load. 348 items of load have a TDC DUML ICP recorded against them. The reasons for this are discussed in detail in **section 2.1**.

The audit found seven non-compliances and makes six recommendations. The future risk rating of 28 indicates that the next audit be completed in three months. I have considered this in conjunction with the comments provided and that the database is switching to a trader who will use the RAMM extract directly for submission eliminating the majority of the submission inaccuracies recorded in this audit and therefore I recommend that the next audit be due in nine months.

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 | Incorrect figures used in the Trustpower internal database for reconciliation is potentially resulting in an estimated over submission of 262,000 kWh per annum.<br><br>Unknown impact on reconciliation for 351 items of load where a TDC DUML ICP is recorded against them but are excluded from reconciliation.<br><br>Three items with no ICP recorded resulting in an estimated under submission of 2,153 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).<br><br>29 items of load with the incorrect ballast recorded resulting in an estimated over submission of 3,724kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).<br><br>33 items of load with zero ballast applied where a ballast should be recorded resulting in an estimated minor annual under submission of 884 kWh. | Weak | High | 9 | Investigating |

| Subject | Section | Clause | Non-Compliance | Controls | Audit Risk Rating | Breach Risk Rating | Remedial Action |
|---|---|---|---|---|---|---|---|
| ICP Identifier | 2.2 | 11(2)(a) and (aa) of Schedule 15.3 | Three items with no ICP recorded resulting in an estimated under submission of 2,153 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool). | Moderate | Low | 2 | Investigating |
| Location of each item of load | 2.3 | 11(2)(b) of Schedule 15.3 | Three items of load with insufficient details recorded to locate them. | Moderate | Low | 2 | Investigating |
| Description and capacity of each item of load | 2.4 | 11(2)(c) of Schedule 15.3 | 33 items of load with zero ballast applied where a ballast should be recorded resulting in an estimated minor annual under submission of 884 kWh. | Moderate | Low | 2 | Investigating |
| All load recorded in the database | 2.5 | 11(2A) of Schedule 15.3 | All load is not recorded in the database. | Moderate | Low | 2 | Investigating |
| Database accuracy | 3.1 | 15.2 and 15.37B(b) | 29 items of load with the incorrect ballast recorded resulting in an estimated over submission of 3,724kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).<br><br>33 items of load with zero ballast applied where a ballast should be recorded resulting in an estimated minor annual under submission of 884 kWh. | Moderate | Low | 2 | Investigating |

| Subject | Section | Clause | Non-Compliance | Controls | Audit Risk Rating | Breach Risk Rating | Remedial Action |
|---|---|---|---|---|---|---|---|
| Volume information accuracy | 3.2 | 15.2 and 15.37B(c) | Incorrect figures used in the Trustpower internal database for reconciliation is potentially resulting in an estimated over submission of 262,000 kWh per annum.<br><br>Unknown impact on reconciliation for 351 items of load where a TDC DUML ICP is recorded against them but are excluded from reconciliation.<br><br>Three items with no ICP recorded resulting in an estimated under submission of 2,153 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).<br><br>29 items of load with the incorrect ballast recorded resulting in an estimated over submission of 3,724kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).<br><br>33 items of load with zero ballast applied where a ballast should be recorded resulting in an estimated minor annual under submission of 884 kWh. | Weak | High | 9 | Investigating |
| Future Risk Rating | | | | | | 28 | |

| **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 |
|---|---|---|
| Deriving submission information | 2.1 | TDC, the trader and NZTA to liaise and determine which ICP these lights are to be reconciled against. |
| | | Pass private light details to Unison to progress. |
| | | If static dimming is confirmed work with the Trader to ensure the correct wattages are recorded in the database and confirm how long this has been present and liaise with Trustpower and new trader to conduct revisions if necessary. |
| Tracking of load change | 2.6 | TDC and the trader liaise with NZTA to ensure changes made in the field are updated in the database. |
| | | Liaise with the networks to confirm process understanding of new streetlight circuit. |
| Database Accuracy | 3.1 | Confirm that correct wattage has been recorded and update lamp descriptions against 96 LED lights |

## ISSUES

| Subject | Section | Description | Issue |
|---|---|---|---|
| | | Nil | |

# 1. ADMINISTRATIVE

## 1.1. Exemptions from Obligations to Comply with Code

### Code reference

*Section 11 of Electricity Industry Act 2010.*

### Code related audit information

*Section 11 of the Electricity Industry Act provides for the Electricity Authority to exempt any participant from compliance with all or any of the clauses.*

### Audit observation

The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

### Audit commentary

There are no exemptions in place relevant to the scope of this audit.

## 1.2. Structure of Organisation

Trustpower provided a copy of their organisational structure.

## 1.3. Persons involved in this audit

Auditor:

**Rebecca Elliot**

**Veritek Limited**

**Electricity Authority Approved Auditor**

Other personnel assisting in this audit were:

| Name | Title | Company |
|---|---|---|
| Robbie Diederen | Reconciliation Analyst | Trustpower |
| Claire Sharland | Asset manager Transportation | Taupo District Council |
| Linda Cameron | Asset Information Manager | Taupo District Council |
| Pip Cameron | Asset Information Officer | Taupo District Council |

## 1.4. Hardware and Software

The SQL database used for the management of DUML is remotely hosted by RAMM Software Ltd. The database is commonly known as "RAMM" which stands for "Roading Asset and Maintenance Management". The specific module used for DUML is called RAMM Contractor.

The database back-up is in accordance with standard industry procedures. Access to the database is secure by way of password protection.

## 1.5. Breaches or Breach Allegations

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

## 1.6. ICP Data

| ICP Number | Description | NSP | Profile | Number of items of load | Database wattage (watts) |
|---|---|---|---|---|---|
| 0000029279HR82A | Atiamuri Streetlights | ROT0111 | STL | 34 | 799 |
| 0000031514WEC89 | Wharewaka Streetlights | WRK0331 | STL | 64 | 5,482 |
| 0001264720UN608 | Taupo Streetlights | WRK0331 | STL | 3,248 | 235,441 |
| 0008807420WM161 | Turangi Streetlights | TKU0331 | STL | 808 | 37,198 |
| 0008808341WM4B6 | Mangakino Streetlights | HTI0331 | STL | 225 | 19,536 |
| **Total** | | | | 4,379 | 380,622 |

I note that the overall volume of lights is similar, but the wattage values have reduced as the LED rollout progresses.

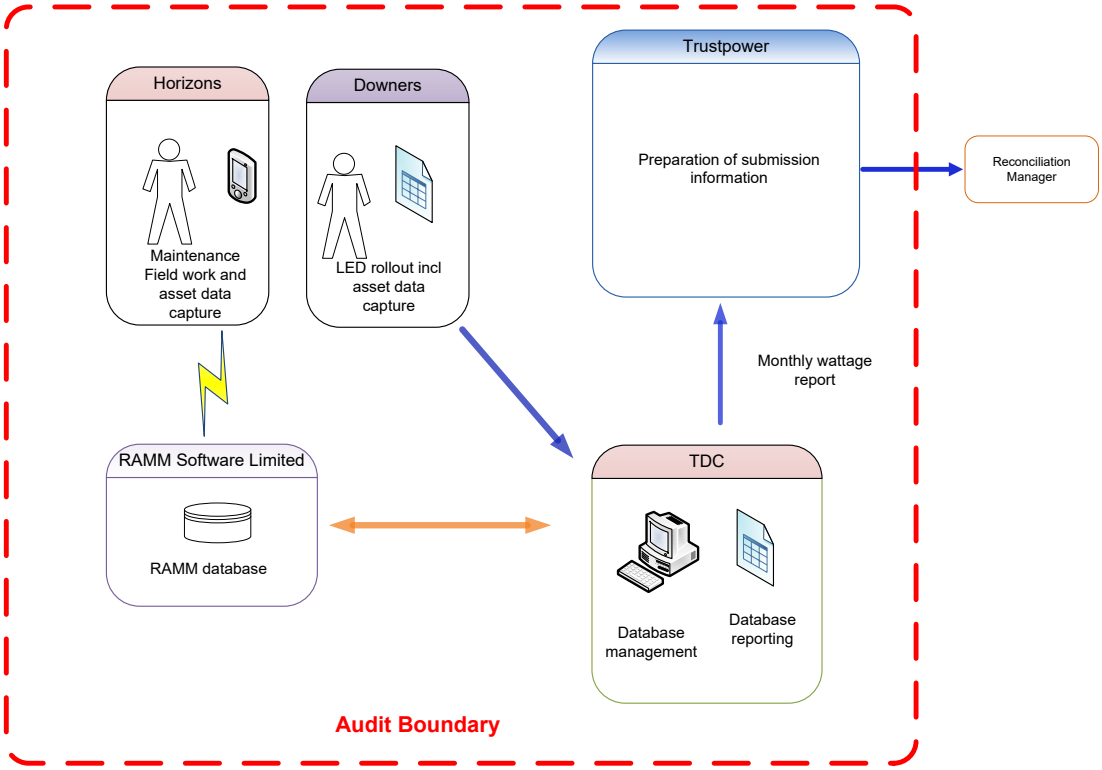
## 1.7. Authorisation Received

All information was provided directly by Trustpower and TDC.

## 1.8. Scope of Audit

TDC use a RAMM database to manage this DUML load. New connection, fault and maintenance work is completed by Horizons. The LED roll out is being carried out by Downer. Monthly reports are received by Trustpower.

The scope of the audit encompasses the collection, security and accuracy of the data, including the preparation of submission information based on the database reporting. The diagram below shows the audit boundary for clarity.




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 415 items of load on 6th May 2019.

## 1.9. Summary of previous audit

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

## Table of Non-Compliance

| Subject | Section | Clause | Non-compliance | Status |
|---|---|---|---|---|
| Deriving submission information | 2.1 | 11(1) of Schedule 15.3 | The variance between the database extract and the monthly report used by Trustpower for submission is potentially resulting in an estimated over submission of 131,074 kWh per annum, if the database is correct. | Still existing |
| | | | The September wattage report has been applied to the month of October and will not be replaced through the revision process. | Still existing |
| | | | Incorrect ballasts recorded in RAMM. | Still existing but much improved |
| | | | ICP not recorded against 32 items of load in the database resulting in an estimated 14,179 kWh of under submission per annum. | Still existing but much improved |
| ICP Identifier | 2.2 | 11(2)(a) and (aa) of Schedule 15.3 | ICP not recorded against 32 items of load in the database resulting in an estimated 14,179 kWh of under submission per annum. | Still existing but much improved |
| Description and capacity of each item of load | 2.4 | 11(2)(c) of Schedule 15.3 | 230 items of load with incomplete lamp details. | Still existing but much improved |
| All load recorded in the database | 2.5 | 11(2A) of Schedule 15.3 | All load is not recorded in the database. | Still existing |
| Database accuracy | 3.1 | 15.2 and 15.37B(b) | 230 items of load with incomplete lamp details. | Cleared |
| | | | Incorrect ballasts recorded in RAMM. | Still existing but much improved |

| Subject | Section | Clause | Non-compliance | Status |
|---|---|---|---|---|
| Volume information accuracy | 3.2 | 15.2 and 15.37B(c) | The variance between the database extract and the monthly report used by Trustpower for submission is potentially resulting in an estimated over submission of 131,074 kWh per annum, if the database is correct. | Still existing |
| | | | The September wattage report has been applied to the month of October and will not be replaced through the revision process. | Still existing |
| | | | Incorrect ballasts recorded in RAMM. | Still existing but much improved |
| | | | ICP not recorded against 32 items of load in the database resulting in an estimated 14,179 kWh of under submission per annum. | Still existing but much improved |

## Table of Recommendations

| Subject | Section | Recommendation for improvement | Status |
|---|---|---|---|
| ICP Identifier | 2.2 | Liaise with RAMM to utilise the "not connected" indicator available in RAMM. | Not progressed |
| Tracking of load change | 2.6 | Liaise with the networks to confirm process understanding of new streetlight circuit. | Still existing and is repeated |

### 1.10. Distributed unmetered load audits (Clause 16A.26 and 17.295F)

**Code reference**

*Clause 16A.26 and 17.295F*

**Code related audit information**

*Retailers must ensure that DUML database audits are completed:*

1. *by 1 June 2018 (for DUML that existed prior to 1 June 2017)*
2. *within three months of submission to the reconciliation manager (for new DUML)*
3. *within the timeframe specified by the Authority for DUML that has been audited since 1 June 2017.*

**Audit observation**

Trustpower have requested Veritek to undertake this streetlight audit.

**Audit commentary**

This audit report confirms that the requirement to conduct an audit has been met for this database within the required timeframe.

**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**

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

I recalculated the submissions for April 2019 using the data logger and the database information. I confirmed that the calculation method was correct, but found the differences detailed in the table below.

| ICPs | Fittings number from April 2019 submission | Fittings number from database extract | Diff | kWh value submitted | Calculated kWh value from database extract | Differences |
|---|---|---|---|---|---|---|
| 0000029279HR82A | 34 | 34 | 0 | 1054 | 302 | 752 |
| 0000031514WEC89 | 64 | 64 | 0 | 2,049 | 2,209 | -160 |
| 0001264720UN608 | 3,042 | 3,248 | -206 | 100,290 | 89,201 | -11,269 |
| 0008807420WM161 | 759 | 808 | -49 | 25,131 | 14,548 | 10,583 |
| 0008808341WM4B6 | 210 | 225 | -15 | 7,095 | 7,640 | -545 |
| **Total month kWh difference** | | | | | | 21,900 |

This will potentially be resulting in an annual over submission of 262,000 kWh. This is an increase in variance found in the last audit due to three reasons:

1. The incorrect wattage figure from the monthly wattage report has been used for submission since January 2019. Trustpower update their own internal database from the monthly wattage report and used the figures in blue rather than the highlighted current wattage field as detailed below. This will be corrected through the revision process.

| Gear Wattage | Lamp Wattage | TOTAL SODIUM | LED Record Date | LED W | CURRENT WATTAGE |
|---|---|---|---|---|---|
| 12 | 70 | 82 | 08/03/19 | 23.5 | 23.5 |
| 12 | 70 | 82 | 08/03/19 | 23.5 | 23.5 |
| 12 | 70 | 82 | 08/03/19 | 23.5 | 23.5 |
| 12 | 70 | 82 | 08/03/19 | 23.5 | 23.5 |
| 12 | 70 | 82 | 08/03/19 | 23.5 | 23.5 |
| 12 | 70 | 82 | 08/03/19 | 23.5 | 23.5 |
| 12 | 70 | 82 | 08/03/19 | 23.5 | 23.5 |

2. The monthly wattage report provided by TDC contains incorrect ballasts. Previously these were being corrected outside of RAMM. Trustpower began using the TDC wattage figures from January 2019. As part of the monthly wattage report, Trustpower requested that light changes be included in the monthly wattage. So, rather than a data extract from RAMM being provided the report below is provided which contained the old ballast wattages.

| Gear Wattage | Lamp Wattage | TOTAL SODIUM | LED Record Date | LED W | CURRENT WATTAGE |
|---|---|---|---|---|---|
| 12 | 70 | 82 | | | 82 |
| 12 | 70 | 82 | | | 82 |
| 12 | 70 | 82 | | | 82 |
| 12 | 70 | 82 | | | 82 |

Examination of the database extract provided for this audit found only a small number of incorrect ballasts. These are detailed in **section 3.1**.

3. TDC are excluding 351 items of load. 348 items of load have a TDC DUML ICP recorded against them. These were discussed during the site audit:
    a. 224 of these are owned amenity lighting and are not the responsibility of the Transportation department. This is an internal issue and TDC are working to either get new ICPs created to account for these lights or on charge these lights to the correct department.
    b. 70 of these are believed to be metered. This will need to be confirmed and if correct the relevant ICP will be populated.
    c. 54 of these are owned by NZTA and are believed to be outside of the 70km speed zone where TDC has an arrangement to pay for and on-bill NZTA lights. Therefore, these should be accounted for under the Taupo NZTA DUML load. I recommend this is progressed with the new trader and NZTA.

| Description | Recommendation | Audited party comment | Remedial action |
|---|---|---|---|
| Deriving submission information | TDC, the trader and NZTA to liaise and determine which ICP these lights are to be reconciled against. | TDC are working with NZTA/Opus to determine boundaries. TDC and OPUS have both confirmed that are making progress in this respect. | Investigating |

    d. Three are privately owned but have a TDC ICP recorded against them. Two are on Rawhiti Road and one is on Spa Road. I recommend that the details for these lights be passed to Unison to progress.

| Description | Recommendation | Audited party comment | Remedial action |
|---|---|---|---|
| Deriving submission information | Pass private light details to Unison to progress | TDC investigating as to the best way to progress. Determine whether to retain in streetlight ICP and pay for the cost themselves or start charging the customer. We will ensure that this is resolved prior the next audit. | Investigating |

The lamp wattages were not provided in the report for the above items of load therefore I cannot calculate the impact on reconciliation. They should be included in the submission load as they have a TDC ICP recorded against them. This is recorded as non-compliance below.

The issue of static dimming raised in the last audit is still being investigated. There is potentially some static dimming installed on the network, but I note that the expected lamp wattage is recorded in RAMM. I recommend that TDC work with the relevant trader to determine how this is to be managed, if it is confirmed to be present as over submission will be occurring.

| Description | Recommendation | Audited party comment | Remedial action |
|---|---|---|---|
| Deriving submission information | If static dimming is confirmed work with the Trader to ensure the correct wattages are recorded in the database and confirm how long this has been present and liaise with Trustpower and new trader to conduct revisions if necessary. | TDC have confirmed with Trustpower are not currently dimming. They do not have the system in place to allow for this. | The comment made appears to refer to dynamic dimming and not static dimming which doesn't require a system but is set at light level. I recommend that this is followed up in the next audit. |

Three items of load have no ICP recorded against them. These all have NZTA indicated as the light owner. They are not being included in the monthly wattage report. The lamp wattage has not been provided but as it is NZTA I have assumed they are 150W HPS and this will be resulting in an estimated 2,153 kWh of under submission per annum. This is also discussed in **section 2.2** and **3.2**.

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

| Detail of submission variances | Volume information impact (annual kWh) |
|---|---|
| Incorrect figures used in the Trustpower internal database for reconciliation | 262,000 kWh over submission |
| Three items with no ICP recorded assumed to be 150W HPS as they are NZTA lights | 2,153 kWh under submission |
| 29 items of load with the incorrect ballast recorded | 3,724 kWh over submission |
| 33 items of load with zero ballast applied where a ballast should be recorded | 884 kWh under submission |

### Audit outcome

Non-compliant

| Non-compliance | Description |
|---|---|
| Audit Ref: 2.1<br>With: Clause 11(1) of Schedule 15.3<br><br>From: 01-Nov-18<br>To: 30-Apr-19 | Incorrect figures used in the Trustpower internal database for reconciliation is potentially resulting in an estimated over submission of 262,000 kWh per annum.<br>Unknown impact on reconciliation for 351 items of load where a TDC DUML ICP is recorded against them but are excluded from reconciliation.<br>Three items with no ICP recorded resulting in an estimated under submission of 2,153 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).<br>29 items of load with the incorrect ballast recorded resulting in an estimated over submission of 3,724kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).<br>33 items of load with zero ballast applied where a ballast should be recorded resulting in an estimated minor annual under submission of 884 kWh.<br>Potential impact: High<br>Actual impact: High<br>Audit history: Twice previously<br>Controls: Weak<br>Breach risk rating: 9 |
| **Audit risk rating** | **Rationale for audit risk rating** |
| **High** | The controls are rated as weak as the number of discrepancies found indicate that whilst controls are in place, they are not identifying errors as expected<br>The impact is assessed to be high due to the potential kWh variances found. |

| Actions taken to resolve the issue | Completion date | Remedial action status |
|---|---|---|
| Have asked TDC to arrange program to validate database. | By 31st August | Investigating |
| **Preventative actions taken to ensure no further issues will occur** | **Completion date** | |
| Have asked TDC to arrange program to validate database. | By 31st August | |

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

### Code reference

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

### Code related audit information

*The DUML database must contain:*

- *each ICP identifier for which the retailer is responsible for the DUML*
- *the items of load associated with the ICP identifier.*

### Audit observation

The database was checked to confirm that an ICP is recorded for each item of load.

### Audit commentary

The 32 lights recorded with no ICP allocated in the previous audit has been reduced to three items of load. These all have NZTA indicated as the light owner. They are not being included in the monthly wattage report. The lamp wattage has not been provided but as it is NZTA I have assumed they are 150W HPS and this will be resulting in an estimated 2,153 kWh of under submission per annum.

### Audit outcome

Non-compliant

| Non-compliance | Description |
|---|---|
| Audit Ref: 2.2<br>With: Clause 11(2)(a) and (aa) of Schedule 15.3<br><br>From: 01-May-18<br>To: 31-Oct-18 | Three items with no ICP recorded resulting in an estimated under submission of 2,153 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).<br>Potential impact: Low<br>Actual impact: Low<br>Audit history: Twice<br>Controls: Moderate<br>Breach risk rating: 2 |
| **Audit risk rating** | **Rationale for audit risk rating** |
| **Low** | The controls are rated as moderate as the issues identified are historic and once resolved I expect the controls to move to strong.<br>The impact is assessed to low based on the estimated volume of under submission. |

| Actions taken to resolve the issue | Completion date | Remedial action status |
|---|---|---|
| Have asked TDC to arrange program to validate database. | By 31st August | Investigating |
| **Preventative actions taken to ensure no further issues will occur** | **Completion date** | |
| Have asked TDC to arrange program to validate database. | By 31st August | |

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

### Code reference

*Clause 11(2)(b) of Schedule 15.3*

### Code related audit information

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

### Audit observation

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

### Audit commentary

The database contains the nearest street address, displacement from end of road and/or Global Positioning System (GPS) coordinates for each item of load. Three items of load had a street name recorded only. These have been passed to TDC to investigate. This is recorded as non-compliance below.

### Audit outcome

Non-compliant

| Non-compliance | Description |
|---|---|
| Audit Ref: 2.3<br>With: Clause 11(2)(b) of Schedule 15.3<br><br>From: 01-Nov-18<br>To: 30-Apr-19 | Three items of load with insufficient details recorded to locate them.<br>Potential impact: Low<br>Actual impact: Low<br>Audit history: None<br>Controls: Moderate<br>Breach risk rating: 2 |
| **Audit risk rating** | **Rationale for audit risk rating** |
| **Low** | The controls are rated as moderate as all but three items of load have locatable details.<br>The impact is assessed to low as these items of load are being reconciled. |

| Actions taken to resolve the issue | Completion date | Remedial action status |
|---|---|---|
| Have requested TDC to update database with details | By 31st August | Investigating |
| **Preventative actions taken to ensure no further issues will occur** | **Completion date** | |
| Have requested TDC to update database with details | By 31st August | |

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

### Code reference

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

### Code related audit information

*The DUML database must contain:*

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

### Audit observation

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

### Audit commentary

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

- all items of load have a gear wattage recorded - this is an improvement from the 219 items of load with no gear wattage figure found in the last audit;
- all items of load have a lamp description recorded; and
- 33 items of load with zero ballast wattage recorded but a ballast should be recorded which will be resulting in a minor estimated annual under submission of 884 kWh - these have been passed to TDC to correct.

In the last audit I recorded that the ballasts recorded in RAMM were not used for submission but were being added by Trustpower as part of the submission process. Trustpower started using the monthly wattage report from January 2019. As detailed in **section 2.1**, the ballasts being provided in the monthly wattage report are incorrect. This section refers only to missing ballasts and these are recorded as non-compliance.

The accuracy of the ballast wattages used for submission are discussed in **sections 2.1** and **3.2.**

### Audit outcome

Non-compliant

| Non-compliance | Description |
|---|---|
| Audit Ref: 2.4<br>With: Clause 11(2) (d) of Schedule 15.3<br><br>From: 01-Nov-18<br>To: 30-Apr-19 | 33 items of load with zero ballast applied where a ballast should be recorded resulting in an estimated minor annual under submission of 884 kWh.<br>Potential impact: Low<br>Actual impact: Low<br>Audit history: Twice previously<br>Controls: Moderate<br>Breach risk rating: 2 |
| **Audit risk rating** | **Rationale for audit risk rating** |
| **Low** | The controls are rated as moderate as the issues identified are historic and once resolved I expect the controls to move to strong.<br>The impact is assessed to be low, as the impact of the incorrect ballasts is low. |

| Actions taken to resolve the issue | Completion date | Remedial action status |
|---|---|---|
| Have requested TDC to update database with details | Immediately | Investigating |
| **Preventative actions taken to ensure no further issues will occur** | **Completion date** | |
| Have requested TDC to update database with details | Immediately | |

## 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 415 items of load on 6th May 2019.

### Audit commentary

The field audit findings were correct with the exception of the lights detailed in the table below:

| Street | Database count | Field count | Light count differences | Wattage recorded incorrectly | Comments |
|---|---|---|---|---|---|
| A C BATHS AVENUE | 39 | 41 | +2 | 1 | 1x 70W HPS recorded in the database but 2x 250W HPS found in the field<br>1x 250W HPS recorded but double found in the field |
| ARIHIA STREET | 2 | 2 | | 1 | 1x incorrect wattage recorded as 70W HPS but 23.5W LED found in the field |
| KINDER STREET | 6 | 6 | | 1 | 1x incorrect wattage recorded as 23.5W LED but 70W HPS found in the field |
| MANIAPOTO GROVE | 1 | 1 | | 1 | 1x incorrect wattage recorded as 70W HPS but 19.9W LED found in the field |
| MARINA TERRACE | 11 | 11 | | 1 | 1x incorrect wattage recorded as 37W LED but 250W HPS found in the field |
| NGAMOTU ROAD | 14 | 14 | | 6 | 6x incorrect wattage recorded as 70W HPS but 37W LED found in the field |
| SERVICE LANE NO 4 | 6 | 6 | | 2 | 2x incorrect wattage recorded as 70W HPS but 22W LED found in the field |
| TONGARIRO STREET (NORTHBOUND) | 6 | 3 | -3 | | 3x LED rope light not found in the field. These are Christmas lights hence they were not found in the field. |

| Street | Database count | Field count | Light count differences | Wattage recorded incorrectly | Comments |
|---|---|---|---|---|---|
| TOTARA STREET TAUPO | 4 | 4 | | 2 | 2x incorrect wattages recorded as 70W HPS but 19.9W LED found in the field |
| HIRANGI ROAD | 8 | 8 | | 1 | 1x incorrect wattage recorded as 70W HPS but 23.5W LED found in the field |
| OTAIATOA STREET | 6 | 7 | +1 | | 1x extra 70W HPS found in the field |
| **Grand Total** | **415** | **415** | **6** | **16** | |

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

The accuracy of the database is detailed in **section 3.1**.

### Audit outcome

Non-compliant

| Non-compliance | Description |
|---|---|
| Audit Ref: 2.5<br>With: Clause 11(2A) of Schedule 15.3<br><br>From: 01-Nov-18<br>To: 30-Apr-19 | All load is not recorded in the database.<br>Potential impact: Low<br>Actual impact: Low<br>Audit history: Twice previously<br>Controls: Moderate<br>Breach risk rating: 2 |
| **Audit risk rating** | **Rationale for audit risk rating** |
| **Low** | The controls are rated as moderate as the processes to capture change will mitigate risk most of the time.<br>The impact is assessed to be low as the majority of the volume of additional lighting found in the sample was small and the database was within the accuracy thresholds. |

| Actions taken to resolve the issue | Completion date | Remedial action status |
|---|---|---|
| Database validation will correct this issue. | By 31st August | Investigating |
| **Preventative actions taken to ensure no further issues will occur** | **Completion date** | |
| Database validation will correct this issue. | By 31st August | |

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

### Code reference

*Clause 11(3) of Schedule 15.3*

### Code related audit information

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

### Audit observation

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

### Audit commentary

Any changes that are made during any given month take effect from the beginning of that month. The information is available which would allow for the total load in kW to be retrospectively derived for any day. On 20 September 2012, the Authority sent a memo to retailers and auditors advising that tracking of load changes at a daily level was not required if the database contained an audit trail. I have interpreted this to mean that the provision of a copy of the report to Trustpower each month is sufficient to achieve compliance.

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

TDC use a RAMM database to manage this DUML load. New connections, fault and maintenance work is completed by Horizons. Nightly patrols are included this contract and the whole network is expected to covered every three months.

TDC record the NZTA load for all lights within the 70km speed zone. NZTA carry out the maintenance of these lights. There is no mechanism for TDC to be advised of changes to the field. I recommend that TDC, the trader liaise with NZTA to ensure changes made to the database are passed to TDC.

| Description | Recommendation | Audited party comment | Remedial action |
|---|---|---|---|
| Tracking of load change | TDC and the trader liaise with NZTA to ensure changes made in the field are updated in the database. | TDC are working with NZTA/Opus to maintain protocols. | Investigating |

Downer are the contractor for the LED upgrade. The updating of these changes is carried out by the contractor into RAMM. All changes made during a month are included in the monthly report provided to Trustpower for submission. The LED roll out is in progress and is expected to be completed for the P (pedestrian) classified roads in June 2019. The V(vehicle) classified roads and in fill lighting contract are about to go out to tender and once the contract is awarded timeframes to complete this programme of work will be confirmed.

The TDC Engineer is responsible to check all claims for work carried out prior to the claim by the contractor being approved for payment. The field audit findings found two examples of LED lights being recorded in the database but HPS lights were found in the field suggesting the contractor has been paid for work not carried out.

TDC continue to review and refine the management of the DUML load and are committed to improve the database accuracy.

The process for the connection of streetlights in new subdivisions was discussed and has not changed during the audit period. TDC have strict requirements for all relevant asset information to be provided prior to the signing off the section 224C that is required before the subdivision is vested to council. This includes a check of all of the "as-builts". The sign off will not be granted before the council is satisfied that the information required is complete. Once the subdivision is vested the assets are added to RAMM. This is expected to happen promptly after the 224C has been issued. Titles cannot be issued prior to this therefore the building of houses is unlikely to occur (and this is the usually the trigger for street lights to go on). TDC do not receive any notification from Unison or the Lines Company of streetlights being connected, therefore there is a possibility that streetlight assets are added to RAMM prior to being electrically connected. I recommend that the trader and TDC liaise with the Unison and the Lines Company to ensure that the process is well mapped between the parties.

| Description | Recommendation | Audited party comment | Remedial action |
|---|---|---|---|
| Tracking of load change | Liaise with the networks to ensure that streetlight electrical connections are notified to TDC. | We have confirmed that Patrols are made by TDC to ensure no lamps are livened prior to vestings. | The issue identified refers to lights being added to RAMM prior to electrical connection. I recommend that the new trader work with TDC and the networks concerned to ensure livening dates are provided either to the trader or the council so that the lights are recorded as electrically connected in the database for the correct date. |

Festive lights are connected into the unmetered circuits and these are added and removed for the relevant months.

**Audit outcome**

Compliant

## 2.7. Audit trail (Clause 11(4) of Schedule 15.3)

### Code reference

*Clause 11(4) of Schedule 15.3*

### Code related audit information

*The DUML database must incorporate an audit trail of all additions and changes that identify:*

- *the before and after values for changes*
- *the date and time of the change or addition*
- *the person who made the addition or change to the database*

### Audit observation

The database was checked for audit trails.

### Audit commentary

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

### Audit outcome

Compliant

## 3. ACCURACY OF DUML DATABASE

### 3.1. Database accuracy (Clause 15.2 and 15.37B(b))

**Code reference**

*Clause 15.2 and 15.37B(b)*

**Code related audit information**

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

**Audit observation**

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

| Plan Item | Comments |
|---|---|
| Area of interest | Taupo district |
| Strata | The database contains items of load in Taupo area.<br>The area has three distinct sub groups of urban, rural, NZTA.<br>The processes for the management of TDC items of load are the same, but I decided to place the items of load into four strata, as follows:<br>1. Rural<br>2. Turangi<br>3. A-M Council Roading<br>4. N-Z Council Roading. |
| Area units | I created a pivot table of the roads in each area and I used a random number generator in a spreadsheet to select a total of 76 sub-units or 7.5% of the database wattage. |
| Total items of load | 415 items of load were checked. |

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

**Audit commentary**

A statistical sample of 415 items of load found that the field data was 100.7% of the database data for the sample checked. This is within the required database accuracy of 5%+/- and therefore compliance is recorded in relation to database accuracy. The statistical sampling tool reported with 95% confidence the precision of the sample was 10.7% and the true load in the field will be between 94.9% to 105.7% of the load recorded in the database. The sample variance is indicative of the number of discrepancies found in the field audit of over and under recording of lights. These are largely due to the current LED rollout that is in progress.

The tool indicated that there is potentially 9,100 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool) of under submission. The statistical sampling tool reported with 95% confidence that there is a potential estimated annual submission variance range of between 64,700 kWh under submission and 74,400 kWh over submission.

Wattages for all items of load were checked against the published standardised wattage table produced by the Electricity Authority and found the ballasts recorded have largely been corrected in RAMM with the exception of 29 items of load:

| | Ballast | | | | | |
|---|---|---|---|---|---|---|
| **Light Type** | **10** | **12** | **18** | **35** | **150** | **Grand Total** |
| 100W HPS (SON T) | 1 | | | | | 1 |
| 70W HPS (SON) | | 2 | | | | 2 |
| 70W HPS (SON-E) | | 7 | | | | 7 |
| 70W HPS (SON-I) | | 2 | | | | 2 |
| 70W HPS (SON-T) | | 1 | | | | 1 |
| AL Type3 LED 160 - 525mA | | | | | 3 | 3 |
| CREE LED | | | | 12 | | 12 |
| CREE XSP2 | | | 1 | | | 1 |
| **Grand Total** | **1** | **12** | **1** | **12** | **3** | **29** |

This will be resulting in an estimated annual over submission of 3,724 kWh. These have been passed to TDC to correct.

As detailed in **section 2.4**, there are 33 items of load with no ballast applied which will be resulting in in a minor estimated annual under submission of 884 kWh. This is recorded as non-compliance in **section 2.4** and below.

As detailed in **sections 2.1** and **3.2**, the ballasts being provided in the monthly wattage report are incorrect due to the incorrect look up being used for the monthly report. This section refers to database accuracy and the items detailed above are recorded as non-compliance.

Analysis of the database confirmed that all items of load have a lamp description but there are 96 items of load where the lamp description details are insufficient to determine if the correct wattage has been recorded:

| | Ballast | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Lamp Description** | **12** | **35** | **45** | **52** | **95** | **101** | **150** | **265** | **Grand Total** |
| AL Type3 LED 160 - 525mA | | | | | | | | 6 | 6 |
| CREE LED | | 17 | | | | | | | 17 |
| CREE XSP1 | | | | 21 | | | | | 21 |
| CREE XSP2 | | | | | | 4 | | | 4 |
| LED 120 | | | | | | | 2 | | 2 |
| LED 1HST 4.5-27 | | | 10 | | | | | | 10 |
| LED Ballast 0.7A-XIL,XAL,XAK, | | | | | | | 4 | | 4 |
| LED Rope | 31 | | | | | | | | 31 |
| LEDway | | | | | 1 | | | | 1 |
| TOTAL | 31 | 17 | 10 | 21 | 1 | 4 | 6 | 6 | 96 |

These have been passed to TDC to provide lamp specification details. I cannot confirm at the time of finalising this report if these are compliant or not, but I recommend the trader work with TDC to confirm these.

| Section | Recommendation | Audited party comment | Remedial action |
|---|---|---|---|
| **Database Accuracy** | Confirm that correct wattage has been recorded and update lamp descriptions against 96 LED lights. | We can confirm that the Lamp wattage is correct. | Identified- no proof has been provided to the auditor to clear this. |

### Audit outcome

Non-compliant

| Non-compliance | Description |
|---|---|
| Audit Ref: 3.1<br>With: Clause 15.2 and 15.37B(b)<br><br>From: 01-Nov-18<br>To: 30-Apr-19 | 29 items of load with the incorrect ballast recorded resulting in an estimated over submission of 3,724kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).<br>33 items of load with zero ballast applied where a ballast should be recorded resulting in an estimated minor annual under submission of 884 kWh.<br>Potential impact: Low<br>Actual impact: Low<br>Audit history: Twice previously<br>Controls: Moderate<br>Breach risk rating: 2 |
| **Audit risk rating** | **Rationale for audit risk rating** |
| **Low** | The controls are rated as moderate, because they are sufficient to ensure that changes to the database are correctly recorded most of the time.<br>The impact is assessed to be low based on the kWh differences described above. |

| Actions taken to resolve the issue | Completion date | Remedial action status |
|---|---|---|
| TDC will rectify the gear wattage | Immediately | Identified |
| **Preventative actions taken to ensure no further issues will occur** | **Completion date** | |
| TDC will rectify the gear wattage | Immediately | |

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

### Audit commentary

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

I recalculated the submissions for April 2019 using the data logger and the database extract information. I confirmed that the calculation method was correct but found, as detailed in **section 2.1**, a variance and this is due to three factors:

1. The incorrect wattage figure from the monthly wattage report has been used for submission since January 2019. Trustpower update their own internal database from the monthly wattage report and used the incorrect figures from the TDC report.
2. The monthly wattage report provided by TDC contains incorrect ballasts. Previously these were being corrected outside of RAMM. Trustpower began using the TDC wattage figures from January 2019. As part of the monthly wattage report, Trustpower requested that light changes be included in the monthly wattage. So, rather than a data extract from RAMM being provided the report was provided which contained the old ballast wattages.
3. TDC are excluding 351 items of load with the above ICPs recorded against them. These were discussed during the site audit:
    a. 224 of these are owned amenity lighting and are not the responsibility of the Transportation department. This is an internal issue and TDC are working to either get new ICPs created to account for these lights or on charge these lights to the correct department.
    b. 70 of these are believed to be metered. This will need to be confirmed and if correct the relevant ICP will be populated.
    c. 54 of these are owned by NZTA and are believed to be outside of the 70km speed zone where TDC has an arrangement to pay for and on-bill NZTA lights. Therefore, these should be accounted for under the Taupo NZTA DUML load. I recommend in **section 2.1** this is progressed with the trader and NZTA.
    d. Three are privately owned but have a TDC ICP recorded against them. Two are on Rawhiti Road and one is on Spa Road. I recommend in **section 2.1**, that the details for these lights be passed to Unison to progress.

The lamp wattages were not provided in the report for the above items of load therefore I cannot calculate the impact on reconciliation. They should be included in the submission load as they have a TDC ICP recorded against them. This is recorded as non-compliance below.

The issue of static dimming raised in the last audit is still being investigated. There is potentially some static dimming installed on the network, but I note that the expected lamp wattage is recorded in RAMM. I recommend in **section 2.1** that TDC work with the relevant trader to determine how this is to be managed, if it is confirmed to be present as over submission will be occurring.

Three items of load have no ICP recorded against them. These all have NZTA indicated as the light owner. They are not being included in the monthly wattage report. The lamp wattage has not been provided but as it is NZTA I have assumed they are 150W HPS and this will be resulting in an estimated 2,153 kWh of under submission per annum. This is also discussed in **section 2.1** and **2.2**.

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

| Detail of submission variances | Volume information impact (annual kWh) |
|---|---|
| Incorrect figures used in the Trustpower internal database for reconciliation | 262,000 kWh over submission |
| Three items with no ICP recorded assumed to be 150W HPS as they are NZTA lights | 2,153 kWh under submission |
| 29 items of load with the incorrect ballast recorded | 3,724 kWh over submission |
| 33 items of load with zero ballast applied where a ballast should be recorded | 884 kWh under submission |

**Audit outcome**

Non-compliant

| Non-compliance | Description |
|---|---|
| Audit Ref: 3.2<br>With: Clause 15.2 and 15.37B(c)<br><br>From: 01-Nov-18<br>To: 30-Apr-19 | Incorrect figures used in the Trustpower internal database for reconciliation is potentially resulting in an estimated over submission of 262,000 kWh per annum.<br>Unknown impact on reconciliation for 351 items of load where a TDC DUML ICP is recorded against them but are excluded from reconciliation.<br>Three items with no ICP recorded resulting in an estimated under submission of 2,153 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).<br>29 items of load with the incorrect ballast recorded resulting in an estimated over submission of 3,724kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).<br>33 items of load with zero ballast applied where a ballast should be recorded resulting in an estimated minor annual under submission of 884 kWh.<br>Potential impact: High<br>Actual impact: High<br>Audit history: Twice previously<br>Controls: Weak<br>Breach risk rating: 9 |
| **Audit risk rating** | **Rationale for audit risk rating** |
| **High** | The controls are rated as weak as the number of discrepancies found indicate that whilst controls are in place, they are not identifying errors as expected<br>The impact is assessed to be high due to the potential kWh variances found. |

| Actions taken to resolve the issue | Completion date | Remedial action status |
|---|---|---|
| Have asked TDC to arrange to validate database. | By 31st August | Investigating |
| **Preventative actions taken to ensure no further issues will occur** | **Completion date** | |
| Have asked TDC to arrange to validate database and maintain updates in a timely manner. | Ongoing | |

## CONCLUSION

This database is switching from Trustpower to Meridian on June 30th,2019.

TDC use a RAMM database to manage this DUML load. New connection, fault and maintenance work is completed by Horizons. Monthly reports are received by Trustpower and Trustpower uploads any changes made during the month to their own internal database.

The LED rollout underway is being undertaken by Downer. This is expected to be completed for the P classified roads in June 2019. The V classified roads are about to go out to tender and once the contract is awarded the programme of work will be confirmed.

TDC continue to review and improve their database management processes. This is evident with the correcting ballasts, assignment of ICPs to all but three items of load. The overall database accuracy was found to be high and well within the +/- 5% variance threshold.

As was found in the last two audits from analysis of the volumes submitted by Trustpower and the database extract are not aligned. This is for three reasons:

1. The incorrect wattage figure has been used from the monthly wattage report since January 2019. Trustpower update their own internal database from the monthly wattage report and the incorrect column of figures has been used to do this. This will be corrected through the revision process.
2. The monthly wattage report provided by TDC contains incorrect ballasts. Previously these were being corrected outside of RAMM but Trustpower started using the TDC wattage report figures from January 2019 and this contained the old ballasts.
3. TDC are excluding 351 items of load. 348 items of load have a TDC DUML ICP recorded against them. The reasons for this are discussed in detail in **section 2.1**.

The audit found seven non-compliances and makes six recommendations. The future risk rating of 28 indicates that the next audit be completed in three months. I have considered this in conjunction with the comments provided and that the database is switching to a trader who will use the RAMM extract directly for submission eliminating the majority of the submission inaccuracies recorded in this audit and therefore I recommend that the next audit be due in nine months.

## PARTICIPANT RESPONSE

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