

**ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT**

For

JACKS POINT AND MERIDIAN ENERGY

NZBN: 9429037696863

Prepared by: Steve Woods

Date audit commenced: 18 January 2022

Date audit report completed: 10 February 2022

Audit report due date: 30-May-22

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EXECUTIVE SUMMARY

This audit of the **Jacks Point streetlight** DUML database and processes was conducted at the request of **Meridian Energy Limited (Meridian)**, 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.

Jacks Point is a private subdivision, and the streetlights are owned and managed separately to the surrounding Queenstown Lakes District Council streetlights. The database is managed by Aurora and the data is held in their GIS system. A monthly report from GIS is provided to Meridian to calculate the kW value.

The field audit was undertaken of a statistical sample of 173 items of load on 27th January 2022. This found that the database is not within the allowable +/-5% accuracy threshold and over submission is likely to be occurring as a result:

- there is a 95% level of confidence that the installed capacity is up to 1 kW lower than the database,
- in absolute terms, total annual consumption is estimated to be 1,900 kWh lower than the DUML database indicates, and
- there is a 95% level of confidence that the annual consumption is between 3,000 kWh to 700 kWh p.a. lower than the database indicates.

I repeat the recommendation from the last audit that the road names be corrected in the database.

This audit found three non-compliances and the future risk rating of six indicates that the next audit be completed in 18 months. I have considered this in conjunction with Meridian's responses and recommend that the next audit be in 18 months.

The matter raised is 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	Clause 11(1) of Schedule 15.3	Total annual consumption is estimated to be 1,900 kWh lower than the DUML database indicates.	Moderate	Low	2	Identified
Database accuracy	3.1	Clause 15.2 and 15.37B(b))	In absolute terms, total annual consumption is estimated to be 1,900 kWh lower than the DUML database indicates.	Moderate	Low	2	Identified
Volume information accuracy	3.2	Clause 15.2 and 15.37B(c))	Total annual consumption is estimated to be 1,900 kWh lower than the DUML database indicates.	Moderate	Low	2	Identified
Future Risk Rating						6	

Future risk rating	0	1-4	5-8	9-15	16-18	19+
Indicative audit frequency	36 months	24 months	18 months	12 months	6 months	3 months

RECOMMENDATIONS

Subject	Section	Recommendation	Remedial outcome
Location of each item of load	2.3	Correct incorrect street names.	Unknown

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

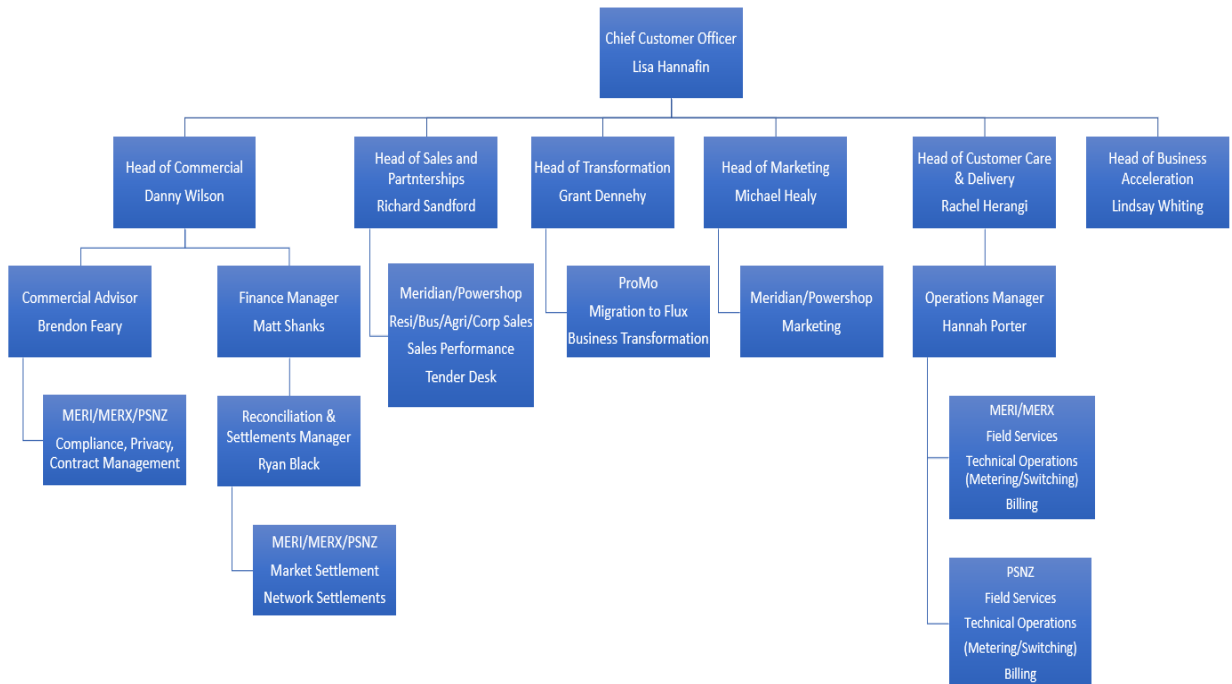
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

Audit commentary

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

1.2. Structure of Organisation

Meridian provided a copy of their organisational structure:



1.3. Persons involved in this audit

Auditor:

Name	Company	Role
Steve Woods	Veritek Limited	Lead Auditor
Claire Stanley	Veritek Limited	Supporting Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Amy Cooper	Compliance Officer	Meridian
Helen Youngman	Energy Data Analyst	Meridian
Simeon Dwyer	Network Billing Analyst	Aurora

1.4. Hardware and Software

The GIS database used for the management of DUML is managed by Aurora.

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

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

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	Number of items of load	Database wattage (watts)
0000486616CEC8C	JACKS POINT STREET LIGHTING	FKN0331	347	8,604

1.7. Authorisation Received

All information was provided directly by Meridian and Aurora.

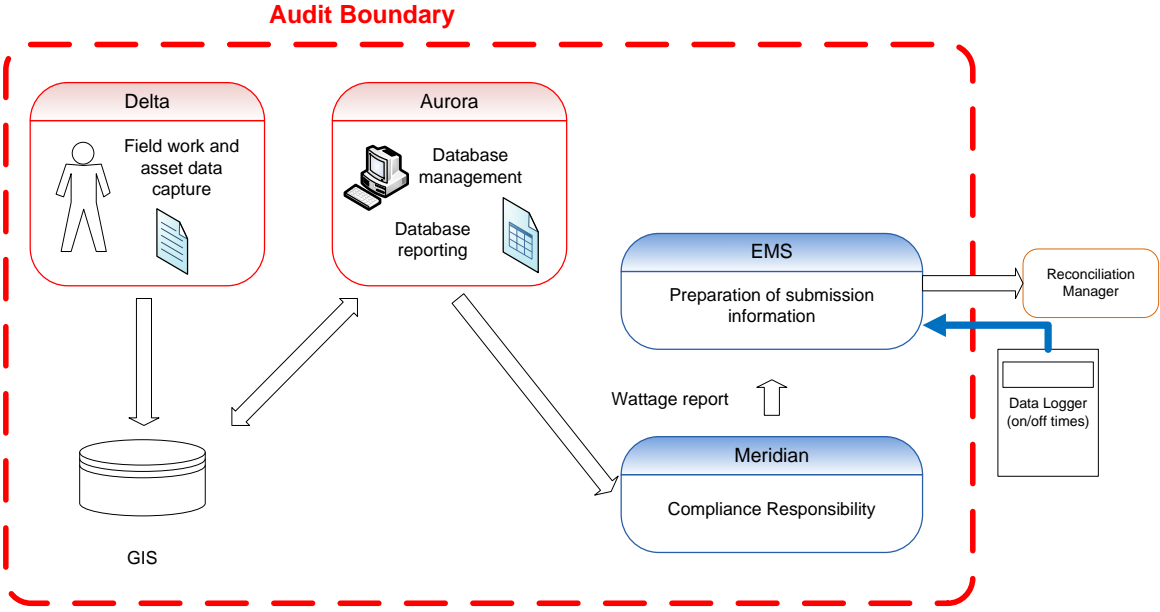
1.8. Scope of Audit

This audit of the Jacks Point streetlight DUML database and processes was conducted at the request of Meridian Energy Limited (Meridian), 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.

Jacks Point is a private subdivision, and the streetlights are owned and managed separately to the surrounding Queenstown Lakes District Council streetlights. The database is managed by Aurora and the data is held in their GIS system. Delta are the field contractors.

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



The field audit was undertaken of a statistical sample of 173 items of load on 27th January 2022.

1.9. Summary of previous audit

The previous audit was completed in May 2019 by Rebecca Elliot of Veritek Limited. That audit found one non-compliance and one recommendation was made. The current status of these are detailed below:

Table of Non-Compliance

Subject	Section	Clause	Non compliance	Status
All load recorded in database	2.5	11(2A) of Schedule 15.3	Two additional items of load found in the field sample.	Cleared

Table of Recommendation

Subject	Section	Recommendation	Status
Location of each item of load	2.3	Correct incorrect street names.	Still existing

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

Meridian has requested Veritek to undertake this streetlight audit.

Audit commentary

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

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 database was checked for accuracy.

Audit commentary

Meridian reconciles this DUML load using the DST profile. The on and off times are derived from a data logger read by EMS. This information is used to create a shape file. Meridian supplies EMS with the capacity information and EMS calculates the kWh figure for each ICP and includes this in the relevant AV080 file. This process was audited during Meridian's reconciliation participant audit, and EMS' agent audit. Compliance was confirmed for both.

I checked the submission for the month of November 2021 and found that the loads matched with the database.

The field audit found that the database was not within the allowable +/-5% accuracy threshold. In absolute terms, total annual consumption is estimated to be 1,900 kWh lower than the DUML database indicates

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 02-Apr-19 To: 18-Jan-22	Total annual consumption is estimated to be 1,900 kWh lower than the DUML database indicates. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2		
Audit risk rating	Rationale for audit risk rating		
Low	Controls are rated as moderate, as they are sufficient to mitigate the risk most of the time but there is room for improvement. The impact is assessed to be low due to the impact on submission.		
Actions taken to resolve the issue		Completion date	Remedial action status
Aurora Energy were advised of the inaccuracies and have confirmed they are corrected		4/5/22	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
Meridian will continue to follow up with Aurora to ensure that the database is kept up to date when installs and changes take place.		10/8/22	

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

Code reference

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

Code related audit information

The DUML database must contain:

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

Audit observation

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

Audit commentary

All items of load had an ICP recorded as required by this clause.

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 the Global Positioning System (GPS) for all items of load which meets the requirements of this clause. The street name is not correct in many instances, and I repeat the last two audit's recommendations that street names are corrected.

Description	Recommendation	Audited party comment	Remedial action
Location of each item of load	Correct incorrect street names.	Aurora Energy advises their GIS system doesn't record the street address of the light but instead calculates and assign the address of the nearest ICP using the GPS co-ordinates, . A streetlight on a stretch of highway might be closest to a house a kilometre away. This means some address records will not match the location of the light exactly but the GPS co-ordinates are accurate. The GIS system functionality is unlikely to be changed.	Unknown

Audit outcome

Compliant

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

Code reference

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

Code related audit information

The DUML database must contain:

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

Audit observation

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

Audit commentary

Lamp type description, lamp wattage and ballast wattage are included in the database. Examination of the database found this was populated for all items of load. The accuracy of this is examined 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 173 lights on 27th January 2022.

Audit commentary

The field audit discrepancies found are detailed in the table below:

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
Rannoch Dr	23	21	-2		2 x 18W LED lights recorded in the database, but not located in the field. Recorded in the database as Rannoch Drive, lights are in McAdam Drive, co-ordinates confirm this.
Double Cone Rd	14	12	-2		2 x 18W LED lights recorded in the database, but not located in the field.
Glenfiddich Road	21	19	-2		2 x 18W LED lights recorded in the database, but not located in the field.
Preserve Drive	31	28	-3		3 x 23W LED recorded in the database but not found in the field Recorded in the database as Preserve Drive, lights are on Lodge Road, co-ordinates confirm this.
GRAND TOTAL	347	338	-9		

No additional items of load were found in the field. The database accuracy is discussed in **section 3.1**.

Audit outcome

Compliant

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 GIS database functionality achieves compliance with the code. There is an “installation date” used for the date of changes and the date of livening for new installations.

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

A database extract was provided, 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	Jacks Point private subdivision
Strata	The database contains items of load in the Jacks Point subdivision just south of Queenstown. The area has two distinct sub groups of existing and new. I decided to place the items of load into the two strata as indicated above: 1. A-McAdam 2. McKellar - W
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 43 sub-units.
Total items of load	173 items of load were checked.

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 173 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	94.9	Wattage from survey is lower than the database wattage by 5.1%
R _L	92.0	With a 95% level of confidence, it can be concluded that the error could be between -8.0% and -1.6%
R _H	98.2	

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

The conclusion from Scenario B is that the variability of the sample results across the strata means that the true wattage (installed in the field) could be between 8.0% and 1.6% lower than the wattage recorded in the DUML database. Non-compliance is recorded because the potential error is greater than 5.0%.

There is a 95% level of confidence that the installed capacity is up to 1 kW lower than the database.

In absolute terms, total annual consumption is estimated to be 1,900 kWh lower than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 3,000 kWh to 700 kWh p.a. lower than the database indicates.

Scenario	Description
A - Good accuracy, good precision	<p>This scenario applies if:</p> <ul style="list-style-type: none"> (a) R_H is less than 1.05; and (b) R_L is greater than 0.95 <p>The conclusion from this scenario is that:</p> <ul style="list-style-type: none"> (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	<p>This scenario applies if:</p> <ul style="list-style-type: none"> (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. <p>There is evidence to support this finding. In statistical terms, the inaccuracy is statistically significant at the 95% level</p>
C - Poor precision	<p>This scenario applies if:</p> <ul style="list-style-type: none"> (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 <p>The conclusion from this scenario is that the best available estimate is not precise enough to conclude that the database is accurate within +/- 5 %</p>

Lamp description and capacity accuracy

Wattages for all items of load were checked against the published standardised wattage table produced by the Electricity Authority and confirmed to be compliant.

Change management process findings

The database is managed by Aurora and the data is held in their GIS system. The fieldwork is managed by Delta.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 02-Apr-19 To: 18-Jan-22	In absolute terms, total annual consumption is estimated to be 1,900 kWh lower than the DUML database indicates. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2		
Audit risk rating	Rationale for audit risk rating		
Low	Controls are rated as moderate, as they are sufficient to mitigate the risk most of the time but there is room for improvement. The impact is assessed to be low, based on the kWh differences described above.		
Actions taken to resolve the issue		Completion date	Remedial action status
Aurora Energy were advised of the inaccuracies and have confirmed they are corrected.		4/5/22	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
Meridian will continue to follow up with Aurora to ensure that the database is kept up to date when installs and changes take place.		10/8/22	

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

Meridian reconciles this DUML load using the DST profile. The on and off times are derived from a data logger read by EMS. This information is used to create a shape file. Meridian supplies EMS with the capacity information and EMS calculates the kWh figure for each ICP and includes this in the relevant AV080 file. This process was audited during Meridian’s reconciliation participant audit, and EMS’ agent audit. Compliance was confirmed for both.

I checked the submission for the month of November 2021 and found that the loads matched with the database.

The field audit found that the database was not within the allowable +/-5% accuracy threshold. In absolute terms, total annual consumption is estimated to be 1,900 kWh lower than the DUML database indicates

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: 02-Apr-19 To: 18-Jan-22	Total annual consumption is estimated to be 1,900 kWh lower than the DUML database indicates. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2		
Audit risk rating	Rationale for audit risk rating		
Low	Controls are rated as moderate, as they are sufficient to mitigate the risk most of the time but there is room for improvement. The impact is assessed to be low due to the impact on submission.		
Actions taken to resolve the issue		Completion date	Remedial action status
Aurora Energy were advised of the inaccuracies and have confirmed they are corrected.		4/5/22	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
Meridian will continue to follow up with Aurora to ensure that the database is kept up to date when installs and changes take place.		10/8/22	

CONCLUSION

Jacks Point is a private subdivision, and the streetlights are owned and managed separately to the surrounding Queenstown Lakes District Council streetlights. The database is managed by Aurora and the data is held in their GIS system. A monthly report from GIS is provided to Meridian to calculate the kW value.

The field audit was undertaken of a statistical sample of 173 items of load on 27th January 2022. This found that the database is not within the allowable +/-5% accuracy threshold and over submission is likely to be occurring as a result:

- there is a 95% level of confidence that the installed capacity is up to 1 kW lower than the database,
- in absolute terms, total annual consumption is estimated to be 1,900 kWh lower than the DUML database indicates, and
- there is a 95% level of confidence that the annual consumption is between 3,000 kWh to 700 kWh p.a. lower than the database indicates.

I repeat the recommendation from the last audit that the road names be corrected in the database.

This audit found three non-compliances and the future risk rating of six indicates that the next audit be completed in 18 months. I have considered this in conjunction with Meridian's responses and recommend that the next audit be in 18 months.

PARTICIPANT RESPONSE

Meridian has reviewed this report and their comments are contained within the report.