Gas Downstream Reconciliation Material Change Audit

For

Pulse Energy

Prepared by: Tara Gannon

Date of Audit: March 2024 to June 2025

Date Audit Report Complete: 19 November 2025

Executive Summary

Up to 30 June 2024 **Pulse Energy Limited (Pulse)** gas registry, switching and reconciliation activity was managed by **Vector Data Services (Vector)** as Pulse's agent.

Since 1 July 2024,

- Pulse has managed its own switching and registry information using Gentrack and a separate Gas Switching and Registry major change audit was completed for this change in June 2024.
- Pulse has been responsible for producing their own GAS040 (monthly non-TOU volumes and ICP numbers), GAS070 (as billed) and GAS080 (meter reading frequency) allocation submissions.

Initially Pulse intended to use Gentrack's submission data, but during pre and post migration testing, Pulse found that the submission data produced by Gentrack was not always consistent with the expected values, and these issues could not all be resolved prior to the end of Vector's service period. Pulse has continued to work with Gentrack to investigate and resolve the issues causing the differences, and in the meantime creates their own allocation reports from their data warehouse.

The change to Pulse producing their own allocation submissions is considered a material change under rule 65.4 of the Gas (Downstream Reconciliation) Rules 2008.

65.4 If the allocation agent or an allocation participant intends to make a change to any of its systems, processes or procedures that could reasonably be considered to be likely to have a major impact on the allocation agent's or allocation participant's compliance with these rules, it must, at least 90 days before the change is to take place, advise the industry body [GIC] of the proposed change.

This audit was conducted at the request of the Gas Industry Company (GIC) under rules 65.5 to 65.6 of the Gas (Downstream Reconciliation) Rules 2008. This review considers Pulse Energy's processes to meet their obligations under the rules.

65.5 Upon notification of a proposed change under rule 65.4, the industry body [GIC] must arrange a performance audit of the allocation agent or allocation participant to be completed at least 30 days before the change is to take effect.

65.6 The purpose of a performance audit arranged under rule 65.5 shall be limited in scope to an audit of the impact of the proposed change on the allocation agent or allocation participant's systems, processes and procedures.

The audit was completed over an extended period from March 2024 to June 2025, as Pulse's plans to manage the process changed following initial testing. Extensive work has been completed to develop, refine and test the data warehouse processes. The revision process ensures that more accurate data is washed up.

Once Pulse is confident that Gentrack is producing accurate allocation submission results, they will commence using Gentrack for submission. It is anticipated that a major change audit to verify the accuracy of submissions and revised process will be completed prior to this.

Conclusion

Pulse is a non-TOU retailer and does not have any supplementary agreements, so compliance was not assessed for the three sections covering these items.

Pulse's control environment needs improvement for non-TOU corrections, and three recommendations were made to improve the processes for stopped meters, meter pressure corrections and inactive consumption corrections.

Controls were acceptable for energy consumption calculation and historic estimate but some non-compliance was identified, including:

Breach Allegation	Rule	Section in this report
Gas conversion calculations do not consistently use the average inputs for the read-to-read period The data warehouse apportions CM for the read-to-read period to each month, and then converts the monthly CM to energy by applying the average conversion factor input values for that month. The inputs should be calculated for the days in the read-to-read period before consumption is apportioned to months.	28.2	4
The historic estimate calculation includes the read date as the first and last day of the read-to-read period When selecting the date range for SADSV, the date of the last actual reading and current actual reading are both included. This results in the volume for each period being spread over too many days leading to some under submission.	35.2	5.5

Controls were effective for the other 13 areas assessed. Good validation processes are now in place, and Pulse has adopted recommendations made in their previous audit.

Summary of Report Findings

Issue	Section	Control Rating (Refer to Appendix 1 for definitions)	Compliance Rating	Comments
Transmission methodology and audit trails	1.5	Effective	Compliant	No changes.
ICP set up information	2.1	Effective	Compliant	There are no changes to the process to manage ICP set up information, and a weekly gas mismatch check ensures that the registry and GTV are consistent. ICP information is imported from the registry to the data warehouse to ensure reports are correctly aggregated.
Metering set up information	2.2	Effective	Compliant	There are no changes to the process to manage meter set up information, and a weekly gas mismatch check ensures that the registry and GTV are consistent. Metering and reading information is imported into the datawarehouse from the registry and Gentrack to ensure reports are complete and accurate.
Billing factors	2.3	Acceptable	Compliant	Billing factors are calculated as expected, but average input and factor values for the month rather than the read-to-read period are applied when preparing reconciliation submissions.
Archiving of reading data	3.1	Effective	Compliant	No changes.
Meter interrogation requirements	3.2	Effective	Compliant	No changes.

Issue	Section	Control Rating (Refer to Appendix 1 for definitions)	Compliance Rating	Comments
Meter reading requirements	3.3	Effective	Compliant	The GAS080 reports Pulse produces from its data warehouse are compliant. There are no other changes to the meter reading process.
Non-TOU validation	3.4	Effective	Compliant	No changes.
Non-TOU error correction	3.5	Needs improvement	Compliant	Corrections continue to be carried out in Gentrack with corrected volumes transferred to the data warehouse to create submissions. The following recommendations for improvement are made: • process stopped meter corrections for all stopped meters where estimated consumption differs from actual consumption, not only where the difference is over ±200 kWh, • develop a process to ensure that revised submission data is provided where meter pressure corrections occur and test the process; this may include reversing invoices with the incorrect pressure applied, updating the meter pressure and rebilling, and • when processing inactive consumption corrections ensure that changes to active status are processed during the read-to-read period, and that any reads recording consumption are entered into Gentrack so that they can be used to calculate historic estimate.
TOU validation	3.6	Not applicable, because all ICPs are settled as non-TOU.		

Issue	Section	Control Rating (Refer to Appendix 1 for definitions)	Compliance Rating	Comments
Energy consumption calculation	4	Acceptable	Not compliant	The data warehouse apportions CM for the read-to-read period to each month, and then converts the monthly CM to energy by applying the average conversion factor input values for that month. The inputs should be calculated for the days in the read-to-read period before consumption is apportioned to months. Apart from the incorrect date ranges for inputs, and not taking the Joule-Thomson effect into account as discussed in **section 2.3** the conversion calculations are compliant.
TOU estimation and correction	5.1	Not applicable – all ICPs are settled as non-TOU		
Provision of retailer consumption information	5.2	Effective	Compliant	The new data warehouse processes are compliant.
Initial submission accuracy	5.3	Effective	Compliant	The new data warehouse processes are compliant.
Forward estimates	5.4	Effective	Compliant	The data warehouse's forward estimate process is compliant.
Historic estimates	5.5	Acceptable	Not compliant	When selecting the date range for SADSV, the date of the last actual reading and current actual reading are both included. This results in the volume for each period being spread over too many days leading to some under submission.
Proportion of HE	5.6	Effective	Compliant	The new data warehouse processes are compliant.

Issue	Section	Control Rating (Refer to Appendix 1 for definitions)	Compliance Rating	Comments
Billed vs consumption comparison	5.7	Effective	Compliant	The new data warehouse processes are compliant.
Gas Trading Notifications	5.8	Not applicable – Pulse has no supplementary agreements and trading notifications are not required.		

Persons Involved in This Audit

Auditor:

Tara Gannon

Provera

People who assisted with the audit:

Name	Title	Company
Marek Tomecki	Senior Reconciliation Analyst	Pulse Energy
Jason Ting	Reconciliation Analyst	Pulse Energy
Catherine Cooper	Office Manager	Gas Industry Company

Contents

1. Pre-Audit and Operational Infrastructure Information

1.1 Scope of Audit

This audit was conducted at the request of GIC under rules 65.5 to 65.6 of the Gas (Downstream Reconciliation) Rules 2008. This review considers Pulse Energy's processes to meet their obligations under the rules.

65.5 *Upon notification of a proposed change under rule 65.4, the industry body [GIC] must arrange a performance audit of the allocation agent or allocation participant to be completed at least 30 days before the change is to take effect.*

65.6 *The purpose of a performance audit arranged under rule 65.5 shall be limited in scope to an audit of the impact of the proposed change on the allocation agent or allocation participant's systems, processes and procedures.*

From 1 July 2024, Vector ceased producing allocation submissions as Pulse's agent and Pulse took responsibility.

The scope of the audit is limited to producing and validating allocation submissions. Gentrack's existing read import and validation have continued to be used, and validated readings, conversion factors, registry ICP information and reconciliation manager seasonal adjusted daily shape values are imported into the data warehouse for use in the submission process.

The audit was conducted in accordance with terms of reference agreed upon by GIC and Provera, in consultation with Pulse. The audit was carried out remotely from April 2024 to June 2025 as the audit information became available.

1.2 Audit Approach

As mentioned in **section 1.1** the purpose of this audit is to assess the performance of Pulse in terms of compliance with the rules, and the systems and processes that have been put in place to enable compliance with the rules.

This audit has examined the effectiveness of the controls Pulse has in place to achieve compliance, and where it has been considered appropriate, sampling has been undertaken to determine compliance.

Where sampling has occurred, this has been conducted using the Auditing Standard 506 (AS-506) which was published by the Institute of Chartered Accountants of New Zealand. I have used my professional judgement to determine the audit method and to select sample sizes, with an objective of ensuring that the results are statistically significant.[1]

Where calculations are performed by Pulse's systems, the algorithm has been checked by using one or two examples as a "sample". Multiple examples are not required because they will not introduce any different variables.

Where compliance is reliant on manual processes, manual data entry for example, the sample size has been increased to a magnitude that, in my judgement, ensures the result has statistical significance.

[1] In statistics, a result is considered statistically significant if it is unlikely to have occurred by chance. (Wikipedia)

Where errors have been found or processes found not to be compliant the materiality of the error or non-conformance has been evaluated.

1.3 General Compliance

1.3.1 Summary of Previous Audit

The previous audit was conducted in 2021 by Julie Langford of Langford Consulting.

The table below shows the issues found during the audit and whether they have been resolved.

Breach Allegation	Rule	Section in this report	Resolution
Breach notice 2021-075 Pulse did not include new ICPs in the initial submission file for any of the 31 sample ICPs checked. For two of the those checked they did not include the ICP in the interim file either.	GDRR 28.3	2.1.1	Awaiting decision from the market administrator.
Breach notice 2021-076 15 ICPs needed to be moved from allocation group 4 to allocation group 6.	GDRR 29.3	3.2	Awaiting decision from the market administrator.
Breach notice 2021-077 The December 2019 GAS080 reported that 130 out of 4,156 ICPs had not had an actual meter read in the last 12 months.	GDRR 29.4.3	3.3	Awaiting decision from the market administrator.

The table below shows the recommendations made during the previous audit and whether they have been adopted.

Section	Recommendation	Status
2.1.1	That Pulse review how they construct the report which drives the submission data, to ensure new ICPs are included in initial submission files.	Adopted.
3.2	That Pulse review their monthly process for validating allocation groups and in particular review them to identify ICPs that should be moved down allocation groups as well as up.	Adopted.
5.4	Pulse should review their methodology for forward estimates and the inclusion of new ICPs in initial files, as ongoing compliance breaches regarding the differences between initial and final submission files are likely to become material if their business continues to grow.	Adopted.

1.3.2 Breach Allegations

Pulse has four alleged downstream reconciliation breaches recorded by the Market Administrator since August 2021. A summary of the breaches is shown in the table below.

Breach notice number	Breach month	Underlying breaches	Rule allegedly breached	Details	Outcome
2021-075	Aug-21	31	28.3	**Raised following previous audit:** Pulse did not include new ICPs in the initial submission file for any of the 31 sample ICPs checked. For two of the those checked they did not include the ICP in the interim file either.	Awaiting decision from the market administrator.
2021-076	Aug-21	15	29.3	**Raised following previous audit:** 15 ICPs needed to be moved from allocation group 4 to allocation group 6.	Awaiting decision from the market administrator.
2021-077	Aug-21	130	29.4.3	**Raised following previous audit:** The December 2019 GAS080 reported that 130 out of 4,156 ICPs had not had an actual meter read in the last 12 months.	Awaiting decision from the market administrator.
2021-085	Nov-21	58	26.2.1, 44.3	**Raised by EMS:** Pulse had applied an incorrect end date when calculating submissions resulting in incorrect interim submission information for July 2021. The Allocation Agent held processing of the submissions until corrected submission information was provided.	Awaiting decision from the market administrator.

As noted in the Summary of Report Findings, this audit recorded non-conformance in three sections leading to two breach allegations, as shown in the table below.

Breach Allegation	Rule	Section in this report
Gas conversion calculations do not consistently use the average inputs for the read-to-read period The data warehouse apportions CM for the read-to-read period to each month, and then converts the monthly CM to energy by applying the average conversion factor input values for that month. The inputs should be calculated for the days in the read-to-read period before consumption is apportioned to months.	28.2	4
The historic estimate calculation includes the read date as the first and last day of the read-to-read period When selecting the date range for SADSV, the date of the last actual reading and current actual reading are both included. This results in the volume for each period being spread over too many days leading to some under submission.	35.2	5.5

1.4 Provision of Information to the Auditor (Rule 69)

In conducting this audit, the auditor may request any information from Pulse, the industry body and any registry participant. Information was provided by Pulse as it became available.

1.5 Draft Audit Report Comments

A draft audit report was provided to the industry body (GIC), the allocation agent, and allocation participants that I considered had an interest in the report. In accordance with rule 70.3 of the 2015 Amendment Version of the Gas (Downstream Reconciliation) Rules 2008, those parties were given an opportunity to comment on the draft audit report and indicate whether they would like their comments attached as an appendix to the final audit report. The following responses were received:

Party	Response	Comments provided	Included in report
Pulse	Yes	Yes	Yes in the response sections

1.6 Transmission Methodology and Audit Trails (Rule 28.4.1)

There will be no changes to Gentrack audit trails.

Up to June 2024, Vector submitted allocation files through the allocation agent portal.

From July 2024 onwards, Pulse has been responsible for submitting allocation files through the allocation portal. The reconciliation team uses checklists to confirm that all reconciliation related tasks are completed, from validation and generation of reconciliation reports, through to receiving and reviewing results provided by the allocation agent.

Future compliance is not expected to be affected by the material change.

2. Set-up and Maintenance of Information in Systems (Rule 28.2)

Every retailer must ensure the conversion of measured volume to volume at standard conditions and the conversion of volume at standard conditions to energy complies with NZS 5259:2015, for metering equipment installed at each consumer installation for which the retailer is the responsible retailer.

Compliance with this rule has been examined in relation to the set-up of ICP, metering and billing information. I have also considered the Gas (Downstream Reconciliation) Rules 2008 Billing factors guideline note v1.0 (Billing Factors Guideline) published by GIC on 30 November 2015 when examining the set up and maintenance of information.

2.1 ICP Set Up Information

Pulse's data warehouse and Gentrack import registry list files to ensure that ICP information is complete and accurate.

2.1.1 New Connections Process

There have been no changes to new connection processes, only the systems data is entered into. Pulse continues to liaise with the network and meter owner to ensure the connection is completed and Gentrack and the registry are updated promptly. Pulse continues to monitor new connections and liaise with the meter owner to obtain connection paperwork and confirm the start reading.

Pulse' has a key performance indicator to claim ICPs within 48 hours of entering into a contract, and compliance is monitored using work queues.

New connections will continue to be processed in Gentrack, but retailer and status updates are sent directly to the registry instead of to Vector. Status and ICP information is imported from the registry into the data warehouse to ensure that submissions are complete, and aggregation factors are correct.

Future compliance is not expected to be affected by the material change.

2.1.2 Altitude Information

Altitude factor calculation

It is a retailer responsibility to comply with NZS 5259 for the conversion of volume to energy. NZS 5259 states that:

- an altitude factor must be applied unless absolute pressure is measured directly by the meter and is used to calculate the pressure factor, and
- the maximum permissible error for the altitude factor is ±1.0% where the meter pressure is less than or equal to 100kPa, and ±0.5% where the meter pressure is greater than 100kPa.

Gas conversion continues to be completed using Gentrack's existing compliant process, and all ICPs will have an altitude factor applied.

ICP altitudes are updated in Gentrack through the registry synchronisation process, with incoming files transferred directly from the registry to Pulse's network using SFTP every 15 minutes. There are no changes to the way in which Gentrack processes the incoming files, and the processes to transfer files to and from Vector are disabled.

A monthly report of altitudes is reviewed to identify any ICPs with altitudes over 450m which are checked for reasonableness by the reconciliation team, and discrepancies between the registry and Gentrack altitudes are reviewed weekly on the gas mismatch report.

Future compliance is not expected to be affected by the material change.

2.2 Metering Set-up Information

All ICPs have non-TOU metering installed, and Pulse does not intend to supply TOU ICPs. Metering information will continue to be determined from the registry and meter paperwork provided by the meter owner.

The weekly gas mismatch report compares the following information in Gentrack and the registry and any discrepancies are investigated and resolved:

- meter serial number,

- meter pressure,
- meter digits,
- meter multiplier,
- network,
- gas gate,
- altitude, and
- network pressure.

There is no validation of meter types, content codes or profile codes, because only non-TOU meters with an uncorrected register content code and the GGRP profile code are expected to be supplied.

Meter change processes

There are no changes to the meter installation, replacement and removal processes. All ICPs will have non-TOU metering and no upgrades or downgrades will occur. Meter changes continue to be processed manually in Gentrack once meter exchange paperwork is received by email.

2.3 Billing Factors

Gas reading validation and conversion to energy continues to be completed in Gentrack, and the validated volumes are transferred to the data warehouse for use in the allocation process.

2.3.1 Temperature Information

Gas conversion continues be completed using Gentrack's existing process, and there will be no changes to the management of temperature information used to convert CM to energy.

I verified that the Gas Industry Company's published temperatures for each gas gate are used by checking temperatures applied by the gas conversion process against the Gas Industry Company's published temperatures. Gas gates recorded in Gentrack are validated against the registry weekly, as part of the gas mismatch, and any discrepancies are investigated and resolved.

Gentrack's temperature factor processes account for the Joule-Thomson Effect. The difference between the calculated and applied temperature factor was within the maximum permissible errors set out in NZS 5259: 2015.

2.3.2 Calorific Values

Gas conversion continues to be completed using Gentrack's existing processes, and there were no changes to management of gas composition information used to convert CM to energy. Future compliance is not expected to be affected by the material change.

3. Meter Reading and Validation

3.1 Archiving of Register Reading Data (Rule 28.4.2)

There were no changes to meter read import, validation or archiving processes. Future compliance is not expected to be affected by the material change.

3.2 Retailer to Ensure Certain Metering Interrogation Requirements are Met (Rule 29)

This rule requires that for consumer installations where the actual or expected consumption is:

- greater than 10 TJ pa, a TOU meter will be installed and the ICP will be assigned to AG1 or AG2 depending on whether telemetry is present; daily meter readings are required, and
- between 250 GJ and 10 TJ pa, a non-TOU meter will be installed and the ICP will be assigned to AG4 and read monthly.

Other installations with non-TOU metering not in AG4, should be assigned to AG5 or AG6.

Assignment of allocation groups

Pulse will not supply ICPs which require allocation groups 1, 2, 3 or 5. Only commercial and residential gas ICPs with annual load of under 10,000 GJ will be supplied in allocation groups 4 and 6.

Monthly, Pulse generates a report from Gentrack showing each ICP's monthly consumption in GJ for the last 12 months, and total consumption in GJ for the last 12 months. The report is opened in excel and each ICP's current allocation group is retrieved from a registry list report using a vlookup.

Pulse reviews the report to identify ICPs which have consumption higher or lower than what is expected for their allocation group. Following investigation to determine whether the consumption is genuine or caused by misreads, the allocation groups will be changed effective from the first day of the month, so that only one allocation group applies per month.

Pulse confirmed that when changes are made in the registry the update will be transferred to Gentrack, and the registry is updated first.

I reviewed reports used in the process and future compliance is not expected to be affected by the material change.

Assignment of meter reading rounds

All gas ICPs have readings collected manually by Wells and are read every two months, apart from ICPs consuming over 250 GJ per annum. There were no changes to the existing meter read attainment processes completed using information from Gentrack.

Under rule 29.4.2 all ICPs with annual consumption between 250 GJ and 10 TJ must have meter readings recorded monthly and are expected to be in AG4. Pulse confirmed that they supply ICPs 002379259QT592, 0000318991QTDED and 0000140981QT1EC which are expected to consume over 250 GJ per annum and are in AG4, and have requested Wells read the meters monthly.

Future compliance is not expected to be affected by the material change.

3.3 Meter Reading Requirements (Rules 29.4.3, 29.5 & 40.2)

Meter read attainment

All gas ICPs have readings collected manually by Wells. There were no changes to the existing meter read attainment processes completed using information from Gentrack. Pulse uses a Gentrack "weekly no actual reading report" which shows connected electricity and gas ICPs which have not received an actual reading for three months or more. The report is used as a working list to identify and follow up ICPs with read attainment issues.

Future compliance is not expected to be affected by the material change.

Meter read attainment reporting

Up to June 2024, Vector produced and submitted the GAS080 meter reading frequency reports as Pulse's agent using registry information and meter reading information provided by Pulse.

Gentrack has created GAS080 reports, but some accuracy issues have been identified. Gentrack and Pulse are working to resolve this. In the meantime, Pulse has created its own GAS080 reports which it has validated against Vector, meter reading, and registry information to ensure that report content is correct. Testing was provided to confirm that the report content is as expected.

Future compliance is not expected to be affected by the material change.

3.4 Non-TOU Validation

There will be no changes to the existing meter read validation processes completed by Pulse's meter readers or within Gentrack. Future compliance is not expected to be affected by the material change.

3.5 Non-TOU Error Correction

There will be no changes to the existing error correction processes, which were found to be compliant during the previous audit. Future compliance is not expected to be affected by the material change.

Multipliers

All Pulse ICPs have a multiplier of one, and multiplier corrections are not expected. If a multiplier correction is required affected invoices would be reversed, the multiplier would be corrected and the ICP would be rebilled.

Stopped or faulty meters

Potentially stopped or faulty meters are identified through the non-TOU read validation process, or reported by the customer, meter reader, or meter owner. A field services job is initiated to check and replace the meter, and confirm whether a fault is present, and then a correction is processed in Gentrack.

The same process is used for electricity and gas stopped meter corrections, and an estimated meter removal reading captures any volumes during the stopped or faulty period. A removal reads calculator calculates the volume for the missing period by using two actual reads no less than seven days apart from the new meter to estimate an average daily consumption. If the missing period is over summer and the reads used to estimate the period are from the winter period, then a 20% adjustment is made in favour of the customer. If the reads are taken from the summer period but the missing period occurred during winter, then a 20% loading is applied.

If the difference between the actual removal reading and estimated removal reading is less than 200 kWh a correction is not usually processed. Corrections should be processed regardless of the difference to ensure that submissions are accurate.

Meter pressure corrections

Meter pressure differences are identified, validated and updated in Gentrack through the weekly gas mismatch process. There is no process to ensure that revised submission data is provided, when gas meter pressure corrections occur.

Inactive status corrections

The same processes are used for electricity and gas inactive consumption. Pulse enters disconnection and reconnection reads where they are available. Where there is no disconnection and/or reconnection boundary read Gentrack pushes the consumption into the active part of the read-to-read period by excluding the seasonal adjusted daily shape values for the inactive days. If the entire read-to-read period is inactive the numerator and denominator will be zero and no consumption will be reported.

Pulse monitors inactive consumption using daily reporting to identify vacant and vacant disconnected ICPs where a read is received but cannot be automatically validated in Gentrack because there is no consumer. The ICPs are investigated to determine whether the consumption is genuine, and if it is the field services and switching team are asked to correct the ICP status to active and arrange another disconnection as necessary. ICPs are removed from the list once they switch out or are moved to an active consumer.

It is recommended that Pulse ensures that the correction to active occurs within the read-to-read period with consumption to make sure that consumption is captured and reported.

Recommendation	Audited party comment
Stopped and faulty meter corrections Process stopped meter corrections for all stopped meters where estimated consumption differs from actual consumption, not only where the difference is over ±200 kWh.	We will look into making this change.
Meter pressure corrections Develop a process to ensure that revised submission data is provided where meter pressure corrections occur, and test the process. This may include reversing invoices with the incorrect pressure applied, updating the meter pressure and rebilling.	We will look into updating this process. The PGRS uses the Historic LIS File for washups so this should be up to date.
Inactive consumption corrections When processing inactive consumption corrections ensure that changes to active status are processed during the read-to-read period, and that any reads recording consumption are entered into Gentrack so that they can be used to calculate historic estimate.	When the PGRS process is run, the system refreshes all readings, so this should be picked up. But we will look into improving this process.

3.6 TOU Validation

No TOU ICPs are supplied or intended to be supplied, and TOU processes were not considered as part of this audit.

4. Energy Consumption Calculation (Rule 28.2)

Gentrack process

Pulse confirmed there were no changes to the gas conversion process. Gas conversion will continue to be completed using Gentrack's existing process. Pulse advised that the compressibility factor is set to one, and they do not expect to supply any ICPs with meter pressure over 50 kPa. Review of a registry list from 3 June 2025 confirmed that no connected ICPs had meter pressures over 35 kPa.

I checked a sample of conversion calculations and confirmed that Gentrack's calculations were within the maximum permissible errors set out in NZS 5259: 2015. Future compliance is not expected to be affected by the material change.

Data warehouse process

The data warehouse calculates the CM to be allocated to each month, which is then converted to energy using the average conversion factors which applied for the month. This is technically non-compliant with the rules and is discussed further in **section 5.5**. Converting to energy after the CM have been apportioned to the allocation period does not ensure the sum of consumption apportioned to each month matches the total consumption for the read-to-read period, or that the correct conversion factor inputs are applied for the read-to-read period.

Like Gentrack, a compressibility factor of 1 is applied. Apart from the incorrect date ranges for inputs, and not taking the Joule-Thomson effect into account as discussed in **section 2.3**, the conversion calculations are compliant.

Average inputs for the read-to-read period are not applied by the data warehouse			
Non-compliance	Description		
Report section: 4 Rule: 35.2 From: 1 July 2024 To: 16 June 2025	Audit history: No Controls: Acceptable Impact: Moderate	The data warehouse apportions CM for the read-to-read period to each month, and then converts the monthly CM to energy by applying the average conversion factor input values for that month. The inputs should be calculated for the days in the read-to-read period before consumption is apportioned to months.	
Remedial action rating	Remedial timeframe	Remedial comment	
The impact is expected to be moderate, as there can be small differences in conversion factor inputs from day to day, which can result in small differences to the average values used to calculate	3 Months	We are looking into improving the initial submission, looking into either using seasonal shape or looking into volume that was submitted for the same period last year or a combination of both. Washups seem to show an improved level of accuracy because we have more reads.	

energy. The conversion calculation itself is operating as expected.		We have provided the supporting code that shows the PGRS taking Joule-Thompson effect into account
Audited party comment		
The circumstances of the matters outlined in the breach notice.	We are looking into improving initial estimation process and we have provided evidence regarding taking the Joule Thompson effect into account.	
Whether or not the participant admits or disputes that it is in breach.	Discussing with Auditor	
Estimate of the impact of the breaches (where admitted).	We have put in additional checks and balances, looking at previous years submission and also looking into average daily consumption, if it is similar to previous periods	
What steps or processes were in place to prevent the breaches?	We have put in additional checks and balances, looking at previous years submission and also looking into average daily consumption, if it is similar to previous periods	
What steps have been taken to prevent recurrence?	We have put in additional checks and balances	

5. Estimation and Submission Information

5.1 TOU Estimation and Correction (Rule 30.3)

No TOU ICPs are supplied or intended to be supplied, and TOU processes were not considered as part of this audit.

5.2 Provision of Retailer Consumption Information (Rules 30 to 33)

GAS050 TOU energy submissions

No TOU ICPs are supplied or intended to be supplied, and TOU processes were not considered as part of this audit.

GAS040 non-TOU energy submissions

Up to June 2024, GAS040 reports were created and submitted to the allocation agent by Vector as Pulse's agent.

Gentrack has created GAS040 reports, but some accuracy issues have been identified. In the meantime, Pulse has created its own GAS040 reports using data warehouse information, including determining aggregation factors from a registry list with history and volumes from Gentrack information. The latest seasonal adjusted daily shape values (SADSV) published by the allocation agent are downloaded from the allocation agent portal and loaded into the data warehouse prior to generating submissions. Pulse's reports have been validated against Vector, meter reading, and registry information to ensure that report content is correct.

Prior to submission, the GAS040 file is checked against ICP level supporting information to ensure it is consistent, and then the submission data is validated by:

- reviewing the average daily consumption between readings before, during and after the reconciliation period which will be used to calculate historic estimate to identify any potentially invalid readings requiring investigation; the report also contains the read values,
- comparing ICP level volumes to the previous month for initial submissions, and previous revision for interim and final submissions, and reviewing any large positive or negative differences and ICPs missing from the previous report,
- checking the ICPs with the highest consumption on the GAS040 to confirm it is genuine and correct,
- comparing the ICP level data to an ICP list with history for the reconciliation period, to ensure that all expected ICPs are included in the submissions for the correct number of ICP days,
- comparing the ICP level data from the data warehouse to ICP level data produced by Gentrack to identify and investigate differences, focussing on ICPs included in one submission but missing from the other, and volume variations; this check assists Pulse and Gentrack to resolve the Gentrack reporting issues, and
- comparing gas gate level data to the GAS070 billed submission so that any anomalies can be investigated.

The pre submission validations are completed several times in the days leading up to submission being due, with the reports re-run following any corrections.

5.3 Initial Submission Accuracy (Rule 37.2)

Rule 37.2 requires that the accuracy of consumption information, for allocation groups 3 to 6, for initial allocation must be within a certain percentage of error published by the industry body.

Pulse's data warehouse generates forward estimates where historic estimated cannot be calculated, which helps to minimise the differences between revisions.

ICP level allocation volumes are validated against previous submissions for the same period for revisions and previous months for initial submissions, and gas gate level GAS040 data is compared to the GAS070 as billed report. Any anomalies are investigated, which should help to identify any invalid forward estimates.

Future compliance is not expected to be affected by the material change.

5.4 Forward Estimates (Rules 34 & 36)

Up to June 2024, forward estimates were calculated and reported as part of the total estimate on the GAS040 report by Vector as Pulse's agent.

Once Pulse begins using Gentrack's reports, Gentrack will produce forward estimates and report them as part of the total estimate on the GAS040 report. Gentrack calculates forward estimate for any ICPs which are not decommissioned or switched out for the submission period, where there are not readings available to calculate historic estimate. Zero consumption is estimated where the ICP is inactive or vacant. For active occupied ICPs, Gentrack stores an average consumption for the installation based on its consumption history, which is profiled using seasonal adjusted daily shape values to create an estimate. Technical documentation was provided to confirm the process.

In the meantime, Pulse's data warehouse creates forward estimates for any periods where an ICP is not decommissioned or switched out and there are not readings available to calculate historic estimate. Forward estimates are created based on one of the methodologies in the table below.

consump_only1_prev_read_EST	Forward estimate is calculated based on the average CM per day across all ICPs which have at least two prior readings for that submission, which is then converted to energy. For the February 2025 submission reviewed this was 1.307 CM.
EST_mid_reading_ICPs	Forward estimate is calculated based on the average CM per day across all ICPs for that submission, which is then converted to energy. For the February 2025 submission reviewed this was 0.827 CM.
EST_no_reading_ICPs	
EST_post_reading_ICPs	
only have 2 prior reads_shape_na	Forward estimate is calculated based on the daily average between the previous two actual readings. The estimates are validated to ensure that the later reading is higher than the previous reading to identify meter roll overs and changes, and ICPs in allocation group 6 with daily averages more than 5 CM are investigated and adjusted as necessary.
pre_and_mid_reads	Forward estimate is calculated on the daily average CM between the pre and mid-point read within ±2%. The estimates are validated to ensure that the later reading is higher than the previous reading to identify meter roll overs and changes, and ICPs in allocation group 6 with daily averages more than 5 CM are investigated and adjusted as necessary.
pre_and_post_reads	Forward estimate is calculated on the daily average CM between the pre and post reads within ±2%.

Earlier reviews of submission information found some examples of ICPs with inaccurate forward estimate, before pre-submission read validation was being completed. The data warehouse process combined with pre-submission read validation to identify and correct potential misreads, meter rollovers and replacements should be sufficient to ensure that forward estimate is calculated accurately. Future compliance is not expected to be affected by the material change.

5.5 Historic Estimates (Rules 34 & 35)

Up to June 2024, historic estimates were calculated and reported as part of the total estimate and historic on the GAS040 report by Vector as Pulse's agent.

Once Pulse begins using Gentrack's reports, Gentrack will produce historic estimates using seasonal adjusted daily shape values (SADSV) provided by the allocation agent and validated volumes and report them as part of the total estimate and historic estimate on the GAS040 report. The SADSV will be imported into Gentrack after they are published by the allocation agent. Technical documentation was provided to confirm the process.

In the meantime, the data warehouse creates historic estimates using readings and conversion factor information from Gentrack, the latest seasonal adjusted daily shape values (SADSV) published by the allocation agent, and ICP attribute and status information from the registry. Inactive days are excluded from submission and it is important that Pulse records disconnection and reconnection reads to ensure that all consumption is submitted.

First, the historic estimate process calculates the average daily consumption for the read-to-read period:

- for initial allocations the average daily consumption is multiplied by the number of days in the reconciliation period (flat line allocation), and
- for interim and final allocations the average daily consumption is apportioned to the correct reconciliation period using shape values; consumption for interim and final allocations is apportioned using the following formula:

$$\frac{\text{Read period consumption}}{\text{Sum of shape values from first day of consumption period to last day of consumption period}} \times \text{Sum of shape values from first day of consumption period which falls within the reconciliation period to the last day of the consumption period which falls within the reconciliation period}$$

There is an issue with the way in which Pulse is determining the date range for shape values, which results in read dates being included as both the last date and first date. For example, 0000140981QT1EC has validated readings on 6 October 2024, 4 December 2024 and 4 January 2025. Historic estimate for December would be calculated as:

$$\frac{\text{Read period consumption 6 October 2024 read to 4 December 2024 read}}{\text{Shape values 6 October 2024 to } \mathbf{4\ December\ 2024}} \times \text{Shape values 1 December 2024 to } \mathbf{4\ December\ 2024}$$

Plus

$$\frac{\text{Read period consumption 4 December 2024 read to 5 January 2025 read}}{\text{Shape values } \mathbf{4\ December\ 2024} \text{ to 4 January 2025}} \times \text{Shape values } \mathbf{4\ December\ 2024} \text{ to 31 December 2024}$$

The consumption period dates include the start **and** end read date. This will result in under submission because the consumption will be shared across too many days. Reads are expected to capture consumption on the read date, and the consumption period is expected to run from the day after the read date to the next read date, except for switch ins, where the opening reading is actually the losing trader's reading on their last day of supply.

The CM volume for the month is then converted to energy using the average conversion factors which applied for the month. This is technically non-compliant with the rules as recorded in **section 4**. Converting to energy after the CM have been apportioned to the allocation period does not ensure the sum of consumption apportioned to each month matches the total consumption for the read-to-read period.

Test	Scenario	Result	Comment
8a	New connection part way through a month		No examples were provided.
8b	Reconnection part way through a month		Volumes are calculated for the active part of the read to read period (initial allocation example

Test	Scenario	Result	Comment
			provided SADSV were not used). Covered by example 8c.
8c	Disconnection part way through a month	✓	Volumes are calculated for the active part of the read to read period (initial allocation example provided SADSV were not used).
8d	Disconnection and reconnection during the same month	✓	Volumes are calculated for the active part of the read to read period (initial allocation example provided SADSV were not used).
8e	Decommissioning (including testing revision submissions for decommissions within the last 12 months)	✓	Volumes are calculated for the active part of the read to read period (initial allocation example provided SADSV were not used).
8f	ICP switches in part way through a month on an estimated reading	✓	
8g	ICP switches out part way through a month on an estimated reading	✓	
8h	ICP switches out and back in within a month	–	No examples were provided.
8i	ICP switches out and back in within 12 months	✓	Initial allocation example provided SADSV were not used.
8j	Continuous ICP with a read during the month	✗	Interim example provided, and shape values were applied for the previous and current read date resulting in a small calculation difference.
8k	Continuous ICP without a read during the month	✗	Interim example provided, and shape values were applied for the previous and current read date resulting in a small calculation difference.
8l	Rollover reads	✓	Initial allocation example provided SADSV were not used.
8m	Gate change part way through a month (including multiple changes within a month)	✓	Initial allocation example provided SADSV were not used.
8n	Allocation group change part way through a month	✓	Pulse will ensure that allocation groups are only changed effective from the first day of the month, and provided an example which showed data before and after the change was consistent, with only the allocation group changing.
8o	Meter replacement	✓	Initial allocation example provided SADSV were not used.
8p	Meter removal	✓	Initial allocation example provided SADSV were not used.

Test	Scenario	Result	Comment
8q	Meter multiplier change	▬	Not tested because multiplier changes are not expected.
8r	Meter pressure change	▬	No examples were found.
8s	Change of customer	✓	Initial allocation example provided SADSV were not used.
8t	Vacant ICP with consumption	✓	Initial allocation example provided SADSV were not used.
8u	Disconnected ICP with consumption between reads	✓	Volumes are calculated for the active part of the read to read period only (initial allocation example provided SADSV were not used). It will be essential to ensure that boundary reads are entered for disconnections and reconnections to ensure that historic estimate is correctly calculated.
8v	Corrections for estimated consumption during periods with stopped meters	▬	No examples available, an estimated closing read will be applied where this occurs.
8w	Initial submissions where reads following the end of the reconciliation period are used to calculate historic estimate	✓	
8x	Revision submissions	✓	

The historic estimate calculation includes the read date as the first <u>and</u> last day of the read-to-read period		
Non-compliance	Description	
Report section: 5.5 Rule: 28.2 From: 1 July 2024 To: 16 June 2025	Audit history: No Controls: Acceptable Impact: Moderate	When selecting the date range for SADSV, the date of the last actual reading and current actual reading are both included. This results in the volume for each period being spread over too many days leading to some under submission.

Remedial action rating	Remedial timeframe	Remedial comment
The impact is expected to be low as the numerator and denominator both include one extra day, resulting in a small amount of under submission.	One Month	This should be a relatively straightforward fix. I will look into this.
Audited party comment		

The circumstances of the matters outlined in the breach notice.	We will investigate this
Whether or not the participant admits or disputes that it is in breach.	Pulse will investigate this further, I am confident we should be able to resolve this quickly.
Estimate of the impact of the breaches (where admitted).	We will investigate and get this resolved as soon as possible, we will try get this resolved before the next washup so the impact should be minor and we should get it resolved before the R13 washup.
What steps or processes were in place to prevent the breaches?	We will do further investigation and testing and put preventative measures in place.
What steps have been taken to prevent recurrence?	We will do further investigation and testing and put preventative measures in place.

5.6 Proportion of Historic Estimates (Rule 40.1)

This rule requires retailers to report to the allocation agent the proportion of historic estimates contained within the consumption information for the previous initial, interim and final allocations.

The GAS040 reports include total estimate and historic estimate, which is consistent with supporting ICP level information for the reports.

5.7 Billed vs Consumption Comparison (Rule 52)

Up to June 2024, GAS070 as billed reports were produced by Vector based on billing information provided by Pulse.

Gentrack has created GAS070 reports, but some accuracy issues have been identified. Gentrack and Pulse are working to resolve this. In the meantime, Pulse has created its own GAS070 reports using data warehouse information, including determining aggregation factors from a registry list with history. Testing was provided confirming that the GAS070 reports were formatted and aggregated correctly, and were correctly based on invoice information.

Allocation volumes will be compared to the GAS070 as billed report at ICP level so that any anomalies can be investigated.

5.8 Gas Trading Notifications (Rule 39)

A retailer must give notice to the Allocation Agent where they commence or cease to supply gas under a supplementary agreement to a transmission services agreement, or amend information required to be provided under the supplementary agreement under rule 39.2.

Pulse does not have any supplementary transmission agreements and will not be required to provide trading notifications.

6. Recommendations

As a result of this audit, I have made three recommendations:

Report section	Recommendation
3.5	**Stopped and faulty meter corrections** Process stopped meter corrections for all stopped meters where estimated consumption differs from actual consumption, not only where the difference is over ±200 kWh.
3.5	**Meter pressure corrections** Develop a process to ensure that revised submission data is provided where meter pressure corrections occur, and test the process. This may include reversing invoices with the incorrect pressure applied, updating the meter pressure and rebilling.
3.5	**Inactive consumption corrections** When processing inactive consumption corrections ensure that changes to active status are processed during the read-to-read period, and that any reads recording consumption are entered into Gentrack so that they can be used to calculate historic estimate.

Appendix 1 – Control Rating Definitions

Rating	Definition
Ineffective	The design of controls overall is ineffective in addressing key causes and/or consequences. Documentation and/or communication of the controls does not exist (e.g. policies, procedures, etc.). The controls are not in operation or have not yet been implemented.
Needs improvement	The design of controls only partially addresses key causes and/or consequences. Documentation and/or communication of the controls (e.g. policies, procedures, etc.) are incomplete, unclear, or inconsistent. The controls are not operating consistently and/or effectively and have not been implemented in full.
Acceptable	The design of controls is largely adequate and effective in addressing key causes and/or consequences. The controls (e.g. policies, procedures, etc.) have been formally documented but not proactively communicated to relevant stakeholders. The controls are largely operating in a satisfactory manner and are providing some level of assurance.
Effective	The design of controls is adequate and effective in addressing the key causes and/or consequences. The controls (e.g. policies, procedures, etc.) have been formally documented and proactively communicated to relevant stakeholders. The controls overall, are operating effectively so as to manage the risk.

Appendix 2 – Impact Rating Definitions

Rating	Definition
Insignificant	A small number of issues with registry file timeliness and/or accuracy. Negligible impact on other participants or consumers. Did not prevent the process completing. A small number of issues with the accuracy and/or timeliness of files to the Allocation Agent. Corrections were made by the interim allocation. A small number of issues not related to registry or allocation information.
Minor	Some issues with registry file timeliness and/or accuracy. Minor impact on other participants or consumers. Did not prevent the process completing. Some issues with the accuracy and/or timeliness of files to the Allocation Agent. Corrections were made by the interim allocation. A small number of issues not related to registry or allocation information.
Moderate	A moderate number of issues with registry file timeliness and/or accuracy. Moderate impact on other participants or consumers. Did prevent some processes completing. A moderate number of issues with the accuracy and/or timeliness of files to the Allocation Agent. Corrections were not made by the interim allocation. A moderate number of issues not related to registry or allocation information.
Major	A significant number of issues with registry file timeliness and/or accuracy. Major impact on other participants or consumers. Did prevent some processes completing. A significant number of issues with the accuracy and/or timeliness of files to the Allocation Agent. Corrections were not made by the interim allocation. A significant number of issues not related to registry or allocation information.

Appendix 3 – Remedial Rating Definitions

Rating	Definition
Completed	The alleged breach and impact have been resolved. Systems and processes are now compliant.
In progress	Steps are being taken to resolve the alleged breach and impact and ensure systems and processes are compliant.
No action	Participant undertakes no action to resolve or address auditor controls or impact assessments for commercial reasons.

Appendix 4 – Pulse Comments

Pulse's comments are recorded in the response boxes in the body of the report.