AGENDA

Te Kaunihera o Te Tairāwhiti
GISBORNE
DISTRICT COUNCIL

P O Box 747, Gisborne, Ph 06 867 2049 Fax 06 867 8076
Email service@gdc.govt.nz Web www.gdc.govt.nz

MEMBERSHIP: Bruce Robertson (Independent Chair), Her Worship the Mayor Rehette Stoltz, Colin Alder, Andy Cranston, Tony Robinson, Rob Telfer and Josh Wharehinga

AUDIT & RISK/ĀRAI TŪRARU ME TE TĀTARI KAUTE Committee

DATE: Wednesday 15 March 2023

TIME: 9:00AM

AT: Te Ruma Kaunihera (Council Meeting Room), Awarua, Fitzherbert Street, Gisborne

AGENDA – OPEN SECTION

Audit & Risk

Reports to:	Council
Chairperson:	Independent Chairperson Bruce Robertson
Membership:	Mayor Rehette Stoltz, Deputy Mayor Josh Wharehinga, Cr Colin Alder, Cr Andy Cranston, Cr Tony Robinson and Cr Rob Telfer
Quorum:	Half of the members when the number is even and a majority when the membership is uneven.
Meeting frequency:	Quarterly (or as required)

Purpose

To assist the Council to exercise due care, diligence and skill in relation to the oversight of:

- the robustness of the internal control framework;
- the integrity and appropriateness of external reporting, and accountability arrangements within the organisation for these functions;
- the robustness of risk management systems, process and practices;
- internal and external audit;
- accounting practice and, where relevant, accounting policy;
- health, safety and wellbeing;[1]
- compliance with applicable laws, regulations, standards and best practice guidelines for public entities; and
- the establishment and maintenance of controls to safeguard the Council's financial and non-financial assets.

The Audit and Risk Committee Chair is responsible for submitting an annual report to the Council covering the Committee's operations and activities during the preceding year.

Terms of Reference

Internal Control Framework

- Consider the adequacy and effectiveness of internal controls and the internal control framework including overseeing privacy and cyber security.
- Enquire as to the steps management has taken to embed a culture that is committed to probity and ethical behaviour.
- Review the processes or systems in place to capture and effectively investigate fraud or material litigation, should it be required.

[1] In regard to health and safety, all Councillors are required to discharge their responsibilities of due diligence under the Health and Safety at Work Act 2015. Staff will provide regular reports to Council to enable members to discharge their duties, and these reports will include any recommendations made by the Audit and Risk Committee in relation to council's health, safety and wellbeing processes.

- Seek confirmation annually, and as necessary, from internal and external auditors, attending Councillors, and management, regarding the completeness, quality and appropriateness of financial and operational information that is provided to the Council.

Risk Management

- Review and consider Management's risk management framework in line with Council's risk appetite – which includes policies and procedures to effectively identify, treat and monitor significant risks, and regular reporting to the Council.
- Assist the Council to determine its appetite for risk.
- Review the principal risks that are determined by Council and Management and consider whether appropriate action is being taken by Management to treat Council's significant risks. Assess the effectiveness of, and monitor compliance with, the risk management framework. Consider emerging significant risks and report these to Council, where appropriate.

Internal Audit

- Review and recommend the annual internal audit plan; such plan to be based on the Council's risk framework.
- Monitor performance against the plan at each regular quarterly meeting.
- Monitor all internal audit reports and the adequacy of Management's response to internal audit recommendations.
- Monitor compliance with the Delegations Manual.

External Audit

- Annually review the independence and confirm the terms of the audit engagement with the external auditor appointed by the Office of the Auditor General. This includes the adequacy of the nature and scope of the audit, and the timetable and fees.
- Review all external audit reporting, discuss with the auditors and review action to be taken by management on significant issues and recommendations and report to Council as appropriate.

Compliance with Legislation, Standards and Best Practice Guidelines

- Review the effectiveness of the system for monitoring the Council's compliance with laws (including governance legislation, regulations and associated government policies), with Council's own standards, and Best Practice Guidelines.

Powers

The Audit and Risk Committee, within the scope of its role and responsibilities, is authorised to:

- obtain any information it needs from any employee and/or external party (subject to their legal obligation to protect information);
- discuss any matters with the external auditor, or other external parties (subject to confidentiality considerations);
- make recommendations to Council and/or the Chief Executive.

The Audit and Risk Committee has no executive powers and is directly responsible to Council.

3.1. Confirmation of non-confidential Minutes 23 November 2023

MINUTES

Draft & Unconfirmed

GISBORNE DISTRICT COUNCIL

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MINUTES of the AUDIT & RISK/ĀRAI TŪRARU ME TE TĀTARI KAUTE Committee

Held in Te Ruma Kaunihera (Council Chambers), Awarua, Fitzherbert Street, Gisborne on Wednesday 23 November 2022 at 9:00AM.

PRESENT:

Bruce Robertson (Independent Chair), Her Worship the Mayor Rehette Stoltz, Colin Alder, Andy Cranston, Tony Robinson, Rob Telfer and Josh Wharehinga.

IN ATTENDANCE:

Chief Executive Nedine Thatcher Swann, Director Lifelines David Wilson, Director Internal Partnerships James Baty, Director Engagement & Maori Responsiveness Anita Reedy-Holthausen, Chief Financial Officer Pauline Foreman, Risk & Performance Manager Steve Breen, Health & Safety Manager David Wilkinson, Democracy & Support Services Manager Heather Kohn and Committee Secretary Jill Simpson.

The meeting commenced with a karakia.

The Chair acknowledged and congratulated Councillor's success in the elections.

Secretarial Note: Items heard out of the order described in the agenda. For ease of reference they have been recorded in agenda order.

1. Apologies

There were no apologies.

Secretarial Note: Chair Bruce Robertson presented on 'A Good Audit & Risk Committee' and the presentation will be forwarded to all Councillors for their information.

2. Declarations of Interest

Cr Wharehinga declared an interest in Report 22-253 Gisborne Holdings Ltd - Ernst & Young Audit Close Report as a Director on the GHL Board.

Cr Telfer declared an interest in Report 22-253 Gisborne Holdings Ltd - Ernst & Young Audit Close Report as the report is assessing the 12 months he was a Director on the GHL Board.

3. Action Sheet and Governance Work Plan

3.1 Action Sheet

Traditionally Council has had forest insurance cover on Council's farm and it covers firefighting costs should a fire start on Council's land however cannot insure against loss of income.

Chief Financial Officer Pauline Foreman will make enquiries on the impact on carbon credits should a fire occur.

3.2 Governance Work Plan

Noted.

4. Leave of Absence

There were no leaves of absence.

5. Acknowledgements and Tributes

There were no acknowledgements or tributes.

6. Public Input and Petitions

There were no public input or petitions.

7. Extraordinary Business

There was no extraordinary business.

8. Notices of Motion

There were no notices of motion.

9. Adjourned Business

There was no adjourned business.

10. Reports of the Chief Executive and Staff for INFORMATION

10.1 22-252 Council Strategic Risk Management Report

Risk and Performance Manager Steve Breen attended and referred to the Strategic Risk Update Summary Table in the report. The remaining three risks are interconnected and more appropriate to complete the risk assessments post-election with the new Committee, given the impact potentially on Council's overall strategy. The intention is that these risks will be assessed and reported back to the Committee once there is clarity over what the actual risk event is that Council is either trying to prevent from occurring or to mitigate the impact and consequences. This is timely as the Long Term Plan and the Tairāwhiti Resource Management Plan processes are underway.

The Capital Projects risk is covered in the report and in particular Kiwa Pools and the Wastewater Treatment Plant.

Questions included:

- Each of the strategic risks would have a serious impact on Council's ability to deliver on one or all of its objectives. The actions being taken are to ensure that Council can deliver its objectives within the resources available and manage the risks of failure within an acceptable level. The heat map will be further modified to clarify the threshold of moderate, ie when Council is stepping over the threshold and when Council is living within the threshold.
- The tsunami maps were redefined and publicly released approximately 2 years ago and this indicated that the CDEM function was situated in a building within the tsunami inundation zone.
- Steps taken in terms of the recruitment process will be captured in future reports.
- Staff vacancies may be attributed to new roles as opposed to staff turnover.
- Exit interviews are carried out when staff leave. The presentation on the deep dive on People & Capability will be presented to Councillors.
- A number of actions are being taken to retain and attract staff.
- It will take 9 - 12 years to get the roading network back to where it was before the severe weather events and will take the additional $161m which is not rated for.
- In Council's current situation it is recommended that Council workshopo the schedule of strategic risks early in the near year and reconfirm they are the strategic risks that are still relevant and appropriate.

MOVED by Bruce Robertson, seconded by Cr Robinson

That the Audit & Risk/Ārai Tūraru me te Tātari Kaute Committee:

1. Notes the contents of this report.

CARRIED

10.2 22-253 Gisborne Holdings Ltd - Ernst & Young Audit Close Report

Gisborne Holdings Ltd Chairman John Rae attended the meeting via audio visual link.

Chief Financial Officer Sophie Ricard and Director Andrew Allan Gisborne Holdings Ltd were in attendance.

Chairman John Rae told the Committee they are in no position to be able to maintain the current asset portfolio without some changes. Gisborne Holdings Ltd (GHL) have been paying dividends to Council from either deferred Opex, Capex or sale of assets and a combination of all over the last 4 to 6 years. The Board has worked hard to meet Council's expectation and desire to have a $2m dividend, however this has come at a cost to GHL's balance sheet. As a Board GHL do not believe that doing what they have always done will give an answer that is acceptable either for the Company or for their shareholder.

Chief Financial Officer Sophie Ricard commented that the change in the accounting treatment of the carbon credits is a major change in the way GHL are reporting accounts.

Questions of clarification included:

- GHL are confident they have the correct resources to improve processes and controls. There have been a number of changes in the GHL Management team and are now more streamlined and focused on the items that really matter.
- GHL have a minimum distribution to meet in accordance with their Distribution Policy however calculation is based on actual cash profit with 50% of the cash profit being distributed to Gisborne District Council.
- The term loan facility now sits under Current Liabilities. This followed a restructure with the Bank. There have been no additional charges from the Bank to date and ongoing discussions are occurring around options.
- GHL were reluctant to provide the Bank with full security over the farm. It is hopeful to change the security with the Bank to the additional land owned at Dunstan Road.
- The next large piece of work for GHL is working through what is possible, what is right and what is the best decision moving forward.
- The reference to the sale of other properties is the sale of the Banks Street land to Council.

MOVED by Cr Stoltz, seconded by Cr Robinson

That the Audit & Risk/Ārai Tūraru me te Tātari Kaute Committee:

1. Notes the contents of this report.

CARRIED

Secretarial Note: The meeting adjourned at 10.28am for morning team and reconvened at 10.50am.

10.3 22-263 Health & Safety

Health & Safety Manager David Wilkinson attended and answered questions of clarification. The area of Contract Management has been strengthened by additional resources focusing on Traffic Management Plan and the roading network. Summer students are going through the induction process.

Questions of clarification include:

- The process taken to maintain a high level of wellbeing among staff has been to work in with Council's culture group as well as looking at a number of initiatives over the next 12 months.
- Currie Construction will be included in the 'Near Miss Reporting - Tier 1 Contractors' as they have just taken on a couple of large projects.
- Council has a huge range of contractors and sub-contractors working across the network and there are appropriate reporting processes in place with regard to health and safety along with spot checks.

- Spontaneous audits are taking place and regular meetings occur with main contractors.
- Lifelines receive a daily report from all contractors across the roading network and they are aware where everyone is working across the district.
- The improvement opportunities listed in the report are critical or important. The challenges faced are in relation to staff turnover and changes of positions and roles.
- The VAULT/Damstra has been upgraded and more training will be taking place.

MOVED by Cr Stoltz, seconded by Cr Wharehinga

That the Audit & Risk/Ārai Tūraru me te Tātari Kaute Committee:

1. Notes the contents of this report.

CARRIED

11. Public Excluded Business

Secretarial Note: These Minutes include a public excluded section. They have been separated for receipt in Section 12 Public Excluded Business of Council

12. Readmittance of the Public

MOVED by Bruce Robertson, seconded by Mayor Stoltz

That the Council:

1. Re-admits the public.

CARRIED

13. Close of Meeting

There being no further business, the meeting concluded at 12.07pm.

Bruce Robertson
INDEPENDENT CHAIR

10. Reports of the Chief Executive and Staff for DECISION

Te Kaunihera o Te Tairāwhiti
GISBORNE
DISTRICT COUNCIL

23-51

Title:	**23-51 Ernst Young Audit Proposal**
Section:	Internal Audit
Prepared by:	Kirsten Smith - Tax Advisor
Meeting Date:	Wednesday 15 March 2023

Legal: No	Financial: Yes	Significance: **Low**

Report to AUDIT & RISK/ĀRAI TŪRARU ME TE TĀTARI KAUTE Committee for decision

PURPOSE - TE TAKE

The purpose of this report is to present Ernst & Young's (EY) proposal to conduct the Gisborne District Council (Council) audit on behalf of the Auditor-General for the 2023, 2024 and 2025 financial years.

SUMMARY - HE WHAKARĀPOPOTOTANGA

At the time of preparing this report, the audit proposal was still with the Office of the Auditor General (OAG) for review. When we receive the proposal, it will either be tabled on the day or sent out a few days prior to the meeting.

Audit partner Stuart Mutch will be in attendance and will provide a verbal update as well as to answer any questions that may arise from the Audit proposal.

The audit is carried out annually under Section 15 of the Public Audit Act 2001 with the aim of providing an independent opinion of the Council's financial statements and performance information, as well as raising any issues around financial management and accountability.

The proposal will be tabled and will provide information on:

- The statutory basis for the audit and how audit fees are set
- The entity and other assurance work covered by this proposal
- Key members of the audit team
- The hours planned to spend on the audit and reasons for any change in hours
- The proposed fees for the audit for the financial years ending 30 June 2023, 2024, and 2025 and reasons for any change
- Assumptions relating to the proposed audit fees
- What the Office of the Auditor-General (OAG) overhead charge provides
- Certification required by the Auditor-General; and
- EY's commitment to conduct the audit in accordance with the Auditor-General's Auditing Standards.

Planned audit hours and fees normally increase due to changes in accounting and auditing standards and increase in scale and project work. We know that there will be additional work required and considerations that will have an impact on the proposal and level of engagement.

EY have agreed with the OAG that they will not set a fee for 2025 at this stage as there remains significant uncertainty in relation to the outcome of the Governments Three Water legislation changes.

Other known impacts will be the increased level of emergency roading reinstatement work and Government subsidies as well as changes to the Information Technology (IT) environment and evaluation of internal controls.

RECOMMENDATIONS - NGĀ TŪTOHUNGA

That the Audit & Risk/Ārai Tūraru me te Tātari Kaute Committee:

1. **Approves the Ernst & Young audit proposal for the financial years ending 30 June 2023, 2024, and 2025 and instructs the Chief Executive to accept the audit fees.**

Authorised by:

Pauline Foreman - Chief Financial Officer

Keywords: 2023, 2024, 2025 audit; Ernst & Young

BACKGROUND - HE WHAKAMĀRAMA

1. The Local Government Act 2002 requires the information in Council's annual reports to be audited. Ernst & Young (EY) have been appointed by the Auditor-General to carry out this audit for the next three years.
2. The audit is carried out annually under Section 15 of the Public Audit Act 2001, with the aim of providing an independent opinion on the Council's financial statements and performance information, as well as any issues around financial management and accountability.
3. The fees for audits are set by the Auditor-General under Section 42 of the Public Audit Act 2001. However, Council has the opportunity to reach agreement with EY on the fees, which are then recommended to the OAG for approval.
4. The Auditor-General, with assistance from the OAG, will set audit fees directly only if we fail to reach agreement.
5. The purpose of the audit proposal is to provide information on:
    a. The statutory basis for the audit and how audit fees are set
    b. The entity and other assurance work covered by this proposal
    c. Key members of the audit team
    d. The hours planned to spend on the audit and reasons for any change in hours
    e. The proposed fees for the audit for the financial years ending 30 June 2023, 2024, and 2025 and reasons for any change
    f. Assumptions relating to the proposed audit fees
    g. What the Office of the Auditor-General (OAG) overhead charge provides
    h. Certification required by the Auditor-General; and
    i. EY's commitment to conduct the audit in accordance with the Auditor-General's Auditing Standards.
6. The audit proposal along with engagement letters define the responsibilities of the Council and Appointed Auditor.

DISCUSSION and OPTIONS - WHAKAWHITINGA KŌRERO me ngā KŌWHIRINGA

7. The estimated audit hours are expected to increase as a result of additional work required. Considerations that will have an impact on the proposal and level of engagement include 3-waters, increased level of emergency roading reinstatement work and Government subsidies, as well as changes to the Information Technology (IT) environment and evaluation of internal controls.

8. Council is responsible for the production of the financial statements and anything else that must be audited. The audit fees are based on the following assumptions:

    a. Council will provide EY, in accordance with the agreed timetable, the complete information required by us to conduct the audit.

    b. Council staff will provide EY with an appropriate level of assistance.

    c. Council's annual report and financial statements (including Statements of Service Performance) will be subject to appropriate levels of quality review by Council before being submitted to EY for audit.

    d. Council's financial statements will include all relevant disclosures.

    e. The reconciliation and roll-forward of infrastructure assets and the measurement of service performance are complete.

    f. EY will review up to two sets of draft annual reports, one printer's proof copy of the annual report, and one copy of the electronic version of the annual report (for publication on Council's website).

    g. There are no significant changes to the structure and/or scale of operations of the entity covered by the proposal.

    h. There are no significant changes to mandatory accounting standards or the financial reporting framework that require additional work.

    i. There are no significant changes to mandatory auditing standards that require additional work other than items specifically identified in the tables above.

    j. There are no significant changes to the agreed audit arrangements that change the scope of, timing of, or disbursements related to, this audit.

9. If the scope and/or amount of work changes significantly, EY will discuss the issues and any implications for their audit costs and Council's audit fees with Council and the OAG at the committee meeting.

10. EY were still in discussion with the OAG in regard to the Audit Proposal Letter for the 2023, 2024 and 2025 financial years. Therefore the Audit Proposal Letter was not available at the time of report compilation. When we receive the Audit proposal letter it will either be tabled on the day or sent out prior to the meeting.

11. Audit partner Stuart Mutch will be in attendance and will provide a verbal update as well as answering any questions that may arise from the Audit proposal.

12. Council has the option to either accept or decline the Audit Fee Proposal. Should Council decline the proposal the Auditor-General will set the audit fees directly.

ASSESSMENT of SIGNIFICANCE - AROTAKENGA o NGĀ HIRANGA

Consideration of consistency with and impact on the Regional Land Transport Plan and its implementation
Overall Process: **Low** Significance
This Report: **Low** Significance

Impacts on Council's delivery of its Financial Strategy and Long Term Plan
Overall Process: **Low** Significance
This Report: **Low** Significance

Inconsistency with Council's current strategy and policy
Overall Process: **Low** Significance
This Report: **Low** Significance

The effects on all or a large part of the Gisborne district
Overall Process: **Low** Significance
This Report: **Low** Significance

The effects on individuals or specific communities
Overall Process: **Low** Significance
This Report: **Low** Significance

The level or history of public interest in the matter or issue
Overall Process: **Low** Significance
This Report: **Low** Significance

13. The decisions or matters in this report are considered to be of **Low** significance in accordance with Council's Significance and Engagement Policy.

TANGATA WHENUA/MĀORI ENGAGEMENT - TŪTAKITANGA TANGATA WHENUA

14. The matters in this report do not require any engagement.

COMMUNITY ENGAGEMENT - TŪTAKITANGA HAPORI

15. The annual audit is accounted for in the Long-Term Plan which the community has been consulted on.

CLIMATE CHANGE – Impacts / Implications - NGĀ REREKĒTANGA ĀHUARANGI – ngā whakaaweawe / ngā ritenga

16. The matters in this report do not have any impact on climate change.

CONSIDERATIONS - HEI WHAKAARO

Financial/Budget

17. The annual audit is budgeted for in the Long-Term Plan.

Legal

18. The audit of Council's Annual Report is a requirement of both the Local Government Act 2002 and the Public Audit Act 2001. EY have been appointed by the Auditor-General to carry out the audit for the next three years.

POLICY and PLANNING IMPLICATIONS - KAUPAPA HERE me ngā RITENGA WHAKAMAHERE

19. There is no policy or planning implication in relation to this report.

RISKS - NGĀ TŪRARU

20. There are no major risks associated with the matters in this report.

Te Kaunihera o Te Tairāwhiti
GISBORNE
DISTRICT COUNCIL

23-50

Title:	**23-50 Ernst Young Audit Plan**
Section:	Internal Audit
Prepared by:	Kirsten Smith - Tax Advisor
Meeting Date:	Wednesday 15 March 2023

Legal: No	Financial: Yes	Significance: **Low**

Report to AUDIT & RISK/ĀRAI TŪRARU ME TE TĀTARI KAUTE Committee for information

PURPOSE - TE TAKE

The purpose of this report is to provide the proposed Audit Plan from Ernst & Young (EY) for Council's 2022/23 Annual Report and any significant changes from the 2021/22 Audit Plan.

SUMMARY - HE WHAKARĀPOPOTOTANGA

The Audit Plan covers the primary objectives of the audit, key components, scope, significant risks, accounting/audit matters and timing.

Council can raise matters of concerns with auditors. These matters can then be incorporated within the audit plan for a reporting year. This will allow Council's auditors to perform additional checks to make sure that those areas of concern are represented fairly within the financial statements in terms of generally accepted accounting principles (GAAP) and reporting standards.

The Audit & Risk Committee is considered a forum for the auditors to identify, discuss and escalate any significant concerns that they may have about any aspects of the financial statements prepared by management.

The key focus areas of the 2022/23 Annual Report the auditors have noted remain largely consistent with the prior year. They are:

- Infrastructure assets
- Emergency works and funding
- Integrity of rates strike, rates invoicing and collection
- Grants and Subsidies
- Non-financial performance information reporting
- Controls over expenditure, procurement and tendering, and
- GDC (Gisborne District Council) Group consolidation.

Key changes to the Audit Plan from 2022/23 include:

- New area of focus – Information Technology (IT) environment including evaluation of internal controls.
- Materiality threshold increased to $2.4m (prior year was $2.2m) with errors of more than $120k (prior year was $110k) being reported to the Audit and Risk Committee.

EY Auditors Stuart Mutch and Loren Hunt will be available during the Committee meeting to answer any questions that may arise from the Audit Plan.

The Audit Plan is appended in **Attachment 1.**

RECOMMENDATIONS - NGĀ TŪTOHUNGA

That the Audit & Risk/Ārai Tūraru me te Tātari Kaute Committee:

1. Notes the contents of this report.

Authorised by:

Pauline Foreman - Chief Financial Officer

Keywords: Audit Plan, infrastructure assets, emergency works and funding, rates strike, rates invoicing, rates collection, grants and subsidies, information reporting, expenditure, procurement, tendering, consolidation. Information technology, internal controls, materiality threshold

ATTACHMENTS - NGĀ TĀPIRITANGA

1. Attachment 1 - GDC EY Audit Plan - Final [**23-50.1** - 16 pages]

Gisborne District Council

Audit Plan for the year ending 30 June 2023

Issued: 9 March 2023

Building a better working world

WELCOME

Dear Audit and Risk Committee Members

Our thoughts are with Committee members, management, and the wider community of Tairāwhiti, in the wake of cyclone Gabrielle. We wish to express our sympathy for you all as you navigate the immediate aftermath as well as the needs of the community in the months ahead.

We are pleased to present our Audit Plan ("Plan") for the audit of the financial statements and service performance information of Gisborne District Council ("GDC") and its controlled entities ("the Group") for the year ending 30 June 2023. This Plan outlines the scope of our services, identifies Ernst & Young ("EY") professionals that will serve you and presents our understanding of some key considerations that will affect the 30 June 2023 audit.

We conduct our audit in accordance with the Auditor General's auditing standards which incorporate International Standards on Auditing (New Zealand). Our audit will be conducted to provide reasonable assurance that the financial statements and service performance information for the year ending 30 June 2023 are free of material misstatement.

Our Plan has been prepared based on our understanding of GDC and the local government sector. We have considered, and will continue to consider, GDC's current and emerging operating risks and assess those that could materially affect the financial statements and performance reporting and align our procedures accordingly. The Plan will be responsive to your needs and will maximise audit effectiveness so we can deliver the high quality audit you expect.

Should you have any questions or comments, please do not hesitate to contact me at stuart.mutch@nz.ey.com or on 027 489 9378.

Yours faithfully

Stuart Mutch
Appointed Auditor
9 March 2023

Loren Hunt
Senior Manager

Kaylene Shelton
Senior Manager

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CONTENTS

EXECUTIVE SUMMARY

AREAS OF AUDIT FOCUS

7

key focus areas identified that remain broadly consistent with the prior year.

The areas of audit focus and the level of complexity or management judgement to be applied are:

- Infrastructure assets — HIGH
- Emergency works and funding — HIGH
- Integrity of rates strike, rates invoicing and collection — MEDIUM
- Grants and subsidies — MEDIUM
- Non-financial performance information reporting; — MEDIUM
- Controls over expenditure, procurement and tendering; and — LOW
- GDC Group consolidation. — LOW

ENGAGEMENT AND FEE

We are currently in discussion with the Office of the Auditor-General in regards to our draft Audit Proposal Letter for the 2023, 2024 and 2025 financial years. We Will communicate our draft with management once available and provide the Committee with a verbal update on progress.

We have agreed with the OAG that we will not set an audit fee for 2025 at this time as there remains significant uncertainty in regards to the outcome of the Governments Three Water legislated changes.

Stuart Mutch continues as Appointed Auditor for the 2nd year and is supported by Loren Hunt and Kaylene Shelton.

TIMING

In light of recent events in Gisborne, we will engage with management to confirm the appropriateness of planned audit timelines to align with the Adoption of the Annual report prior to 31 October 2023.

We will also continue to liaise with management in relation to the preparation of the 2024 to 2034 Long-Term Plan and our audit responsibilities. Management have notified us of their intention to request relief from the Local Government Act 2002 obligations to prepare a Long-Term Plan due to the impact on operations and funding of Cyclone Gabrielle.

AUDIT APPROACH

The revisions to the auditing standard on risk assessment (ISA (NZ) 315) are effective for the current period audit. We have outlined the effects of these revisions on page 9.

Details of our controls-based approach are outlined on page 10. As in prior years we seek to test controls over the key financial statement processes and therefore expect to take a control based approach for the following processes:

- Expenditure and accounts payable;
- Payroll and related employee entitlements; and
- Rates setting and collection.

PLANNING MATERIALITY

Our audit is planned to obtain reasonable assurance of detecting misstatements that we believe could be, individually or in aggregate, material to the financial statements.

Our materiality threshold has been set at $2.4m, being 2% of forecasted expenditure. We will report to the Audit & Risk Committee errors of more than $120k. We expect that expenditure may rise significantly in the last four months of the year in response to the impact of Cyclone Gabrielle. We will update our materiality assessment prior to year end.

INDEPENDENCE

We remain in compliance with the NZICA Code of Ethics and Professional and Ethical Standard 1: *Code of Ethics for Assurance Practitioners*' as well as the Office of the Auditor General's independence requirements, and in our professional judgment, the engagement team and the Firm are independent. We have the appropriate controls in place to ensure we remain independent throughout the audit.

Emergency works and funding

Background

- The Gisborne region has suffered a number of unprecedented weather events in recent years, which has required a significant quantum of emergency works required in order to open key roads and renew Council assets to keep the district connected.
- We are conscious that cyclone Gabrielle is the most destructive event experienced in the region and there will be a significant amount of works required in order to have the essential needs met for all areas of the district particularly in land transport connectivity and water supply.
- Central Government has contributed an initial $1m to the Mayoral Relief Fund which has also been supplemented by donations to the Disaster Relief Fund.
- Waka Kotahi provides emergency funding for roading damaged in such events, on an as-needed basis subject to approval based on estimated costs required, and does not necessarily cover 100% of costs incurred in remediation. Such funding is provided on the basis the work will return the roads to the previous condition and not improve the level of service from the damaged road.
- There is a backlog of remedial emergency works to be completed for previous weather events, for which not all funding had been secured prior to Cyclone Gabrielle.
- Waka Kotahi has monitoring and compliance requirements in order to provide funding, which is claimed in arrears based on actual amounts incurred.
- Council have a number of considerations to make including:
  - Assessment of the extent of damage, anticipated costs and priorities of work to be completed
  - The impact on core Council services, particularly water supply, that is critical to the wellbeing of the community
  - funding the shortfall of any costs not recoverable from central government or other funding, including how this funding source aligns with Council's funding and treasury policies
  - Ability and reporting available to monitor various emergency works funding in line with the requirements of each funding provider
  - Cashflow ability to make upfront payments and claim these back from each funding provider in arrears
  - Capacity of contractors approved for Council works to complete remediation activities of the most affected areas in a timely manner

Planned Audit Approach

We will remain engaged with Management as the full extent of emergency works and planned funding methods are further progressed. Our audit procedures would include:

- Obtaining any agreements, amendments or correspondence between GDC and central government or other providers in respect of funding approved.
- We will review the impact assessment by Council in regards to the impairment of core infrastructure assets.
- We will understand Councils ability to report on service provision in light of the move to a State of Emergency and the loss of services for periods of time following the passage of the cyclone through the region.
- Reviewing GDC's procedures for revenue recognition and monitoring the conditions of the various grants.
- Review GDC's approach to filing insurance claims for physical damage or losses of earnings at Council or within GHL's operations.
- Checking, on a sample basis, that revenue is being recognised in line with obligations/undertakings being satisfied.
- Examining cost claims, on a sample basis, to check the expenditure is allowed to be claimed and that the funding assistance rate applied is appropriate.
- For a sample of revenue recognised in the year across all grants, we will vouch receipt of funds to cash received.

Relevant accounting standards: PBE IPSAS 23 *Revenue from Non-Exchange Transactions*

Level of complexity or management judgement: HIGH

Infrastructure assets

Background

- Infrastructure assets represent a significant component of the Council's balance sheet with carrying values of the following amounts at 30 June 2022:

Assets	$million
Roading	1,909
Three waters	402
Other infrastructure assets	35
Total	2,346

- Roading assets are revalued annually by an independent third party, Stantec. Three water and flood control assets have a triennial full revaluation cycle. Full revaluations of these assets occurred as at 30 June 2022 and management intend to use an indexation method in reflecting any valuation movements to the asset values as at 30 June 2023.
- There is a risk that the useful life assumptions used in the valuations are not reflective of up to date information maintained in the Council's Asset Management Plans.
- GDC continue to complete roading infrastructure work associated with the Provisional Growth Fund support secured. The contract with the Ministry of Business, Innovation and Employment covers a period through to 2024.
- Misclassification of maintenance and/or capital expenditure given nature and useful life of work completed is also a risk.
- Given the significant amount of damage caused by Cyclone Gabrielle, there are significant impairments to the Council's portfolio of assets to be assessed.
- The Three waters reforms continue to progress and information continues to be released by central government as time elapses to the expected transition date of 1 July 2024.

Planned Audit Approach

- We will examine management's assessment for significant asset impairments and the resultant write-down of Council infrastructure assets.
- For roading assets, we will review the respective valuations for appropriateness and obtain a reliance letter from the independent valuers engaged by GDC. In particular, we will review key inputs to the valuation and consider valuation techniques for appropriateness as well as appropriateness of data used in valuation.
- We will assess the appropriateness of the indexation method used by GDC to assess fair value movements of infrastructure assets for the year to 30 June 2023, including the appropriateness of the rates used, validate source of indexation information, calculate the application of indexation used and ensure all applicable assets have been appropriately considered.
- For any asset classes that are not being revalued in the current year, we will examine the assumptions underlying the historical valuation against current asset management plans to assess whether the value remains materially correct.
- We will review the fixed asset reconciliation of underlying data to the general ledger with a focus on significant additions and disposals during the year.
- We will examine the appropriateness of depreciation against the estimated useful lives in the Council's accounting policies. We will also consider the useful lives included in the most recent valuations.
- We will test on a sample basis the classification procedures relating to capital, renewal and maintenance work as well as cut off at year end for capital works to check it is consistent with work completed at that point.
- We will test, on a sample basis, the accounting for significant additions and disposals of assets during the year.
- We will maintain a watching brief on the progress made by central government in relation to reforms and ownership change to three waters. We will work with Council to ensure appropriate disclosures are included in the financial statements.

Relevant accounting standards: PBE IPSAS 17 *Properties, Plant and Equipment*

Level of complexity or management judgement: HIGH

Integrity of Rates Strike, Rates invoicing and collection

Background

- Rates income levied represents the Council's primary revenue source. There is specific legislation in place which must be adhered to for the rates set to be lawful. In the local authority context, failure to comply with rating law and the associated consultation requirements can create significant risks to the integrity of rates revenue.
- The requirement for there to be consistency between the rates resolution, Funding impact statement and the Finance Policy in the LTP is fundamental because this is the thread that links community consultation to the rates levied by GDC forming the core of the Council's revenue.
- The accuracy of a rates strike is dependent on the integrity of the rates database. The reliability of the rates billing system should ensure rates are billed appropriately.
- Recent legal challenges against certain local authorities have identified a range of issues relating to the legislative compliance, and therefore legality of rates sought.
- There has been media attention in the aftermath of Cyclone Gabrielle for consideration of how Councils ought to recover rates revenue from properties which have been red-stickered.

Planned Audit Approach

Audit Approach

- We will review GDC's rate resolution for the financial year and its linkage to the Long Term Plan.
- We will review GDC's procedures for ensuring the rates set are compliant with the Local Government Rating Act and test that the rates set are being applied appropriately to the rating database and invoiced accordingly.
- We will test the controls over the rates levying process to assess whether these are operating effectively.
- On a sample basis, we will undertake a review of billing to specific ratepayers and subsequent collection.
- Certain rate paying groups represent a higher collection risk. We will examine any provision for doubtful rates debtors to consider whether it is appropriate in the circumstances.
- We will remain abreast of any considerations for impacts on rates revenue as a result of Cyclone Gabrielle.

Relevant accounting standards: PBE IPSAS 23 *Revenue from Non-Exchange Transactions*

Level of complexity or management judgement: MEDIUM

Grants and Subsidies

Background

- the government's Crown infrastructure fund granted GDC a climate resilience package to support the Waipaoa River Flood Control project as well as a grant for the redevelopment of the Olympic swimming pool. Both projects are ongoing during FY23.
- Council receive NZTA funding to subsidise costs associated with local roads. The funding assistance rate is typically 67% with higher amounts being available in certain circumstances such as for emergency works.
- As at 30 June 2022, $11m funding was received from Department of Internal Affairs (DIA) for which $6m was being used to fund the Waste Water Treatment Plant.
- GDC recognise a liability until work is conducted and objectives met ahead of revenue being recognised. Elements of the work is outsourced and GDC will transfer those funds in advance to the third parties and recognised a prepayment until they receive support for the expenses being incurred and then release the revenue accordingly.
- We expect Council will receive significant additional funding to support its work in relation to Cyclone Gabrielle from both public and private sector organisations.

Planned Audit Approach

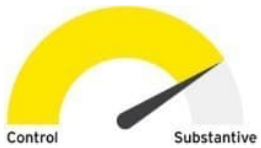
Audit Approach

- Obtain new agreements, amendments or correspondence between GDC and the Crown in respect of funding approved.
- We will review GDC's procedures for revenue recognition and monitoring the conditions of the various grants.
- We will check, on a sample basis, that revenue is being recognised in line with obligations/undertakings being satisfied.
- We will examine cost claims to NZTA, DIA and MBIE, on a sample basis, to check the expenditure is allowed to be claimed and funding assistance rate applied is appropriate.
- For a sample of revenue recognised in the year across all grants, we will vouch receipt of funds to cash received.

Relevant accounting standards: PBE IPSAS 23 *Revenue from Non-Exchange Transactions*

Level of complexity or management judgement: MEDIUM

Low Risk Focus Areas

Audit Approach	Areas of Audit Focus	Background	Planned Audit Approach
	Non-financial performance information reporting MEDIUM	► GDC is required to report its performance against levels of service expectations and performance measures included in the LTP. These measures are key to the Council providing a "performance story" to the community. ► Our audit opinion on the service performance information covers compliance with generally accepted accounting practice, and whether the service performance report fairly reflects the Council's actual service performance for the period. ► As a consequence of Cyclone Gabrielle significant gaps in service delivery, particularly in relation to water supply have impacted the District. ► Council is required to report on mandatory measures in relation to drinking water, as governed by DIA. Historically independent drinking water assessors have performed audits of sufficient regularity to support audit procedures for reporting in the annual report. Taumata Arowai became the water services regulator in November 2021 and removed this requirement. In addition, new Drinking water Quality Assurance Rules, Drinking Water Standards and Aesthetic Values came into effect in November 2022. ► Based on discussions with management, Council intends to engage an independent drinking water assessor, Wai Comply, to assess compliance with the drinking water standards under both Standards which are applicable during the financial year.	► Our audit procedures will focus on assessing completeness and effectiveness of GDC's non-financial performance reporting. ► We will assess which areas of service provision have been significantly impacted by Cyclone Gabrielle and how Council are identifying this and recording amendments to they reported performance. ► We will update our understanding of key performance reporting processes and review methodologies applied by GDC. ► We will check, on a sample basis, the measures have been accurately reported on and outputs have been achieved where stipulated. ► Review mandatory performance measures stipulated by the Non-Financial Performance Measures rules 2013 and ensure all required measures have been appropriately included in GDC's reporting. ► Review independent assessment of Drinking water standards to ensure the scope of the assessment appropriately complies with standards reported against in the mandatory performance measures. We will also ensure the disclosures in relation to these measures are appropriate given the change to standards which have occurred during the year. ► Provide feedback on the overall annual report and the summary annual report.
	Core controls over expenditure, procurement and tendering LOW	► Appropriateness of Councillor and management expenditure is an area of interest to ratepayers. ► Council's capital works procurement programme involves significant cash flows and complex long term contract management. ► Areas of expenditure such as travel, accommodation, training and catering can present opportunities for personal benefit (or perceived personal benefit).	► In considering expenditure and procurement, we will review Council's policies to check if there is adequate guidance regarding the procedures for handling sensitive expenditure and conflicts of interest within the organisation and policies are consistent with best practice guidelines issued by the OAG in 2020. This includes the following types of expenses; travel, training, consultant fees, use of credit cards and Councillor expenses. We will also give consideration to Procurement and Contract tendering processes.

Low Risk Focus Areas

Audit Approach | **Areas of Audit Focus** | **Background** | **Planned Audit Approach**

GDC Group Consolidation

LOW

- GDC is the sole shareholder of Gisborne Holdings Limited (GHL) and therefore are required to consolidate GHL and prepare Group financial statements in line with PBE IPSAS 6.
- GHL is a for profit entity and prepares their stand-alone financial statements in line with IFRS for-profit accounting standards.
- There is a risk that GHL have incurred physical damage to land, buildings and the loss of operational earnings. Insurance is maintained in relation to such losses.
- Consolidation for GDC is required to translate differences in accounting treatment of GHL to Public Sector PBE accounting standards and eliminate any inter-entity transactions between GDC and GHL.
- There is a strategic review of GHL which has been underway for 12 months, to assess the scope and purpose of the entity and the appropriate structure going forward.

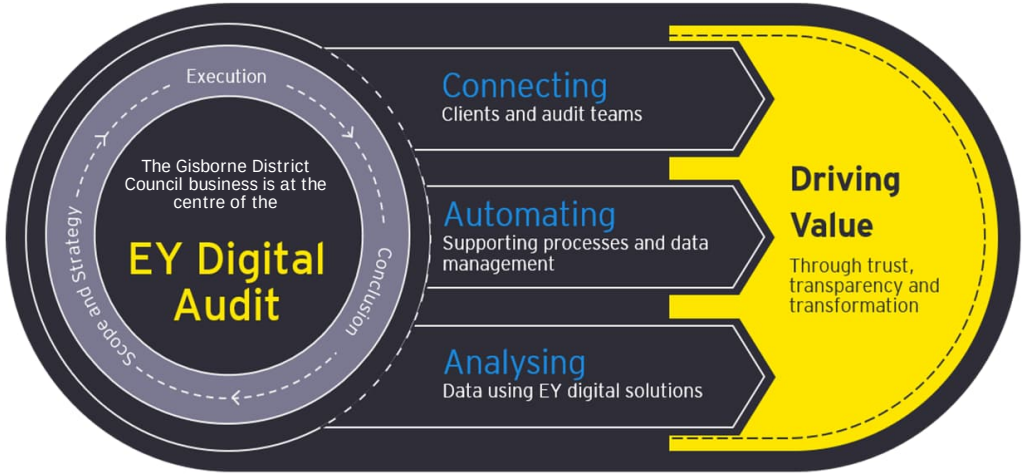
- As a part of our audit of GHL we will assess the impact that Cyclone Gabrielle has had on the company's performance and the potential for insurance claims to be made.
- We will update our understanding of the consolidation process for GDC group accounts.
- We will review all material consolidation journals posted for completeness and accuracy, in line with GDC's accounting policies and PBE IPSAS 6.
- As part of our review of the financial statements we will ensure Group disclosure requirements are appropriately reflected.
- We continue to discuss with management the future of GHL and will consider any changes in this space and any resultant impact of the annual report.

Digital Audit Approach

Your purpose built digital audit for now, next and beyond

Digitalisation continues to be one of the most important drivers of transformation, especially in these changing times. The effects of the COVID-19 pandemic have disrupted the normal accounting and reporting cycle for many companies and accelerated the digitalisation of working environments. It is even more critical now for companies to share trustworthy and readily available financial information for stakeholders.

- Gisborne District Council stakeholders rightfully demand audits of the highest quality.
- Gisborne District Council want to ensure that audits are leveraging your latest investments in systems, technology and data.
- Gisborne District Council want greater transparency of the audit process.
- Gisborne District Council expect auditors to ask meaningful and insightful questions about your data throughout the audit.



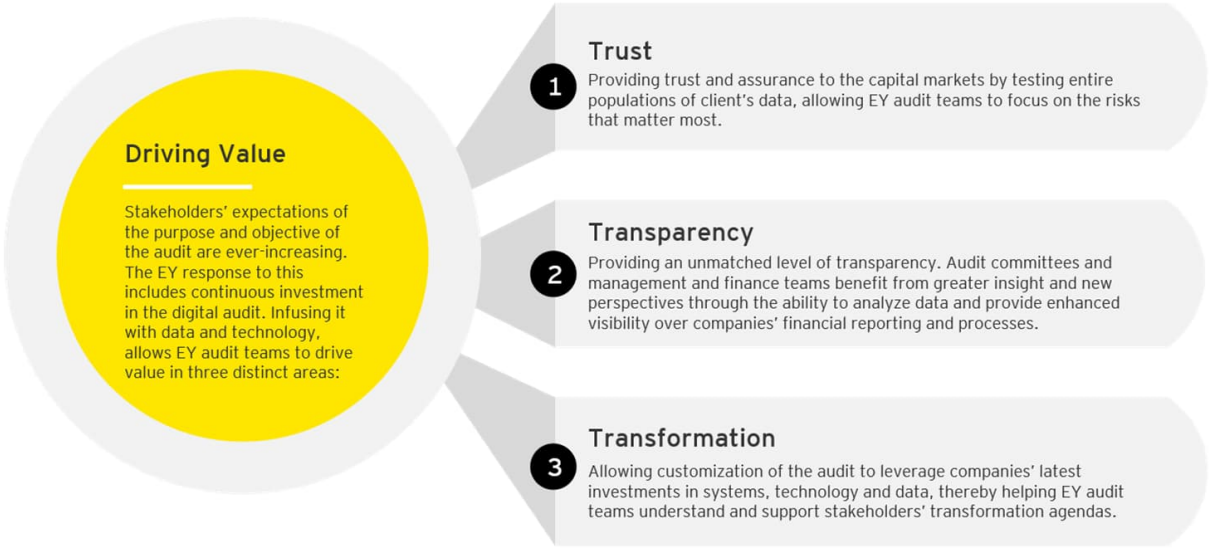
Data-driven Audit

To meet the expectations of stakeholders, regulators and clients of a modern audit, EY has invested over a $1bn in new technology, revolutionising our professional practice. This is the EY Digital Audit, the first data-driven audit.

As a result of EY's transformation journey, it stands today as the only global organization with the data, technology and people to provide a globally consistent, fully scalable and data-driven audit.

With the EY Digital Audit analysing large or full sets of data from our clients' data population, we are responsive to the changing risk profiles of our clients. This helps establish trust, not just in our clients' financial reporting but also in the capital markets as a whole. Data-driven procedures can bring insights to management and audit committees alike, enabling them to be proactive in investigating issues and addressing risks. This new level of transparency changes the client experience significantly and helps to make the audit more valuable.

The EY Digital Audit improves the way our auditors look at risk, reduces management burden in supporting the audit and provides new insights to improve Gisborne District Council's finance processes.



Find out more:

ISA (NZ) 315: identifying and assessing the risks of material misstatement

Revised ISA (NZ) 315 - Impact on the 2023 GDC audit

Summary of key changes

The revisions to the auditing standard on risk assessment (ISA (NZ) 315) are effective for the current period audit. The effects are far-reaching, particularly in in our risk assessment of the IT environment. The following are the main areas of the revisions.

1 Understanding the IT environment, including IT general controls

- Regardless of whether we plan to rely on controls, new requirements to:
  - Understand the IT environment (applications, infrastructure and IT processes) that support key business processes.
  - Identify specific IT risks, and evaluate design and implementation of management's IT general controls ("ITGCs") that address those risks.

2 Evaluation of internal control

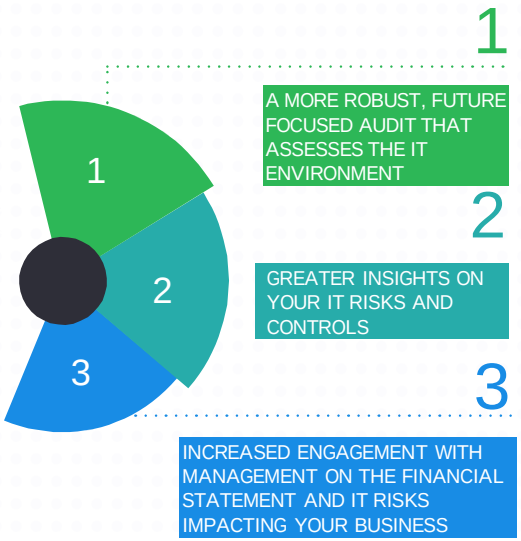
- Procedures to obtain an understanding of and evaluate internal control to extend beyond enquiry and include observation and inspection.
- This will include understanding whether those charged with governance have created and maintained a culture of honesty and integrity.

So what does this mean?

We have upskilled our people, invested in technology and expanded our audit programs to respond to these incremental changes to auditing standards.

We stay focused on the risks that impact your business and provide feedback and insights to management and the Board.

We have considered the incremental audit effort in setting our fee in the 2023-2025 Audit Proposal Letter.



How GDC's audit is impacted

This table summarises the key changes to the audit of GDC for the year ending 30 June 2023:

Significant class of transaction	Application	Assessment of impact
Financial statement close process, other revenue	Ozone	Moderate
purchase to pay	Ozone	Significant
Rates setting and collection	Ozone	Significant
Payroll	DataPay, Ozone	Significant
Infrastructure asset management	IPS8, RAMM	Moderate
Non-financial Performance Reporting	Various	Low

Key

New requirement to identify and evaluate design and implementation of IT controls.
Substantive audit strategy, requirement applies to *minimum* relevant controls only.
IT controls reliance achieved or not applicable for considerations due to manual process.

Internal Control Environment

The primary responsibility for the design and operating effectiveness of the internal control environment, including the prevention and detection of fraud and error, rests with those charged with governance and management.

We obtain an understanding of internal control sufficient to plan our audit and determine the nature, timing and extent of testing performed. Although our audit is not designed to express an opinion on the effectiveness of internal control we are required to communicate significant deficiencies in internal control to you.
Our assessment of internal controls covers:

- The control environment including entity level controls
- GDC's risk assessment procedures
- The design and operating effectiveness of internal controls (including IT general controls)
- Monitoring of controls (internal audit and self-assessment)

We provide management with a report on control findings during the audit process, outlining our findings and our recommendations on where improvements in internal controls can be made. Where significant deficiencies come to our attention, we will communicate these to the Committee.

Assessing the Risk of Fraud

Our responsibility as the external auditor is to consider the risk of fraud and the factors that are associated with it so as to provide reasonable assurance that the financial statements are free from material misstatement resulting from fraud. However, it is important to note that while our external audit work is not primarily directed towards the detection of fraud or other irregularities, we will report any matters identified during the course of our work.

When developing our Audit Plan we use professional judgement in determining whether a fraud risk factor is present. We determine fraud risk factors in the context of the three conditions generally present when fraud occurs (i.e., incentive/pressure, opportunity and attitude/rationalisation).

Controls Reliance

Set out below is the level of controls reliance we expect to achieve over the key financial statement process. In the course of any audit, there are areas where a controls reliance approach is not appropriate and where a substantive audit approach is more efficient or effective.

Process	Reliance On Internal Controls
Financial statement close	
Expenditure and accounts payable	
Payroll and related employee entitlements	
Rates setting and collection	
Infrastructure asset management	
Non-financial performance reporting	
Other revenue - fees and subsidies	

APPENDICES

A. Independence

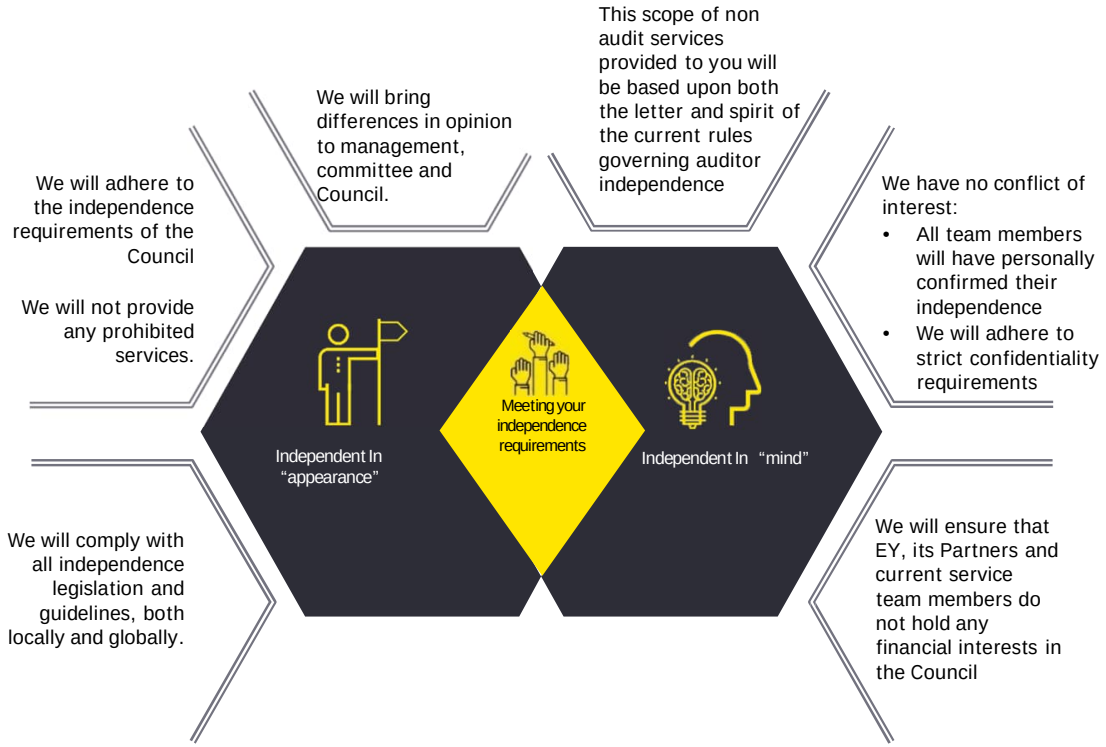
Independence is fundamental to EY as our ongoing reputation and success is connected to our ability to meet both the Council's and broader regulatory independence requirements.

We have consistently complied with all professional regulations relating to auditor independence including those outlined in:

- PES 1 International Code of Ethics for Assurance Practitioners (including International Independence Standards) (New Zealand)
- Independence requirements of the Office of the Auditor-General

Accordingly, we ensure that there are controls in place and actions taken on a regular basis that mitigate any risks to our independence.

There are no matters that, in our professional judgement, bear on our independence which need to be disclosed to the Audit Committee.



B. Focused on Your Future

Regulatory

Sector matters

There continues to be ongoing change in the legislative and regulatory space for local authorities.	► The Government has establishment a dedicated water regulator, Taumata Arowai, to help ensure safe drinking water and deliver improved environmental outcomes from New Zealand's wastewater and stormwater systems. In November 2022, new Drinking water Standards became effective. ► In December 2022 legislation was passed setting out the requirement that assets three water assets will transfer to the newly established water service entities from 1 July 2024.
Support and funding relief for regions impacted by Cyclone Gabrielle.	► Due to the evolving nature of support available to Council and individuals in the District, consideration should be made for any accounting or disclosure impact of any announcements from Central Government or supporting entities in response to Cyclone Gabrielle.
2024-2034 Long Term Plan	► In Line with the requirements of the Local Government Act, Council is required to prepare the 2024-2034 Long-Term-Plan, which is required to be adopted prior to 30 June 2024. ► Management have engaged with us proactively in the planning phases of the LTP and we will continue to work with management as the preparation of the LTP progresses.

B. Focused on Your Future

Climate Risk Disclosure

Questions for Councils to consider

New Zealand is witnessing a significant change in climate-related organisational risk. Climate change is not limited to a solely environmental concern, for many organisations, it presents a material financial risk. The increasing awareness of climate-related risks is driving Counsellors, directors, managers and those in governance roles in New Zealand to question what they can and should be doing to assess and manage climate risks.

Climate Risk Disclosures

The Taskforce on Climate-related Financial Disclosures (TCFD) is a framework developed by the Financial Stability Board for organisations to disclose how climate change is being addressed as a systemic financial risk to their business and the economy.

80%

of the top 1100 global companies now disclose climate-related financial risks in line with some of the TCFD recommendations.

59%

of New Zealand's top 200 companies do not disclose any climate information whatsoever, while the level of information provided by those that do is generally low.

Highlights of the TCFD recommendations:

- Applicable to all organisations
- Disclosures to be included in financial filings
- Designed to solicit decision-useful, forward-looking information for financial markets
- Focused on risks and opportunities from the transition to a low carbon economy and the physical changes expected from climate change

Core elements of recommended climate-related financial disclosures

Regulatory

Core elements of recommended climate-related financial disclosures

Australia	ASIC have updated guidance to address the disclosures
United Kingdom	Mandatory reporting will be implemented from 2022
European Union	Under the French Energy Transition Law there has been mandatory reporting for Listed companies, banks and institutional investors since 2017.

In New Zealand a recent legal opinion commissioned by The Aotearoa Circle concluded company Directors, trustees and fund managers have requirements to consider climate risk in decision making. The New Zealand Government plans to make climate related disclosures mandatory for some organisations, particularly listed issuers and licenced insurers, registered banks and investment managers.

As stakeholder expectations change some of the climate related risks may become material to the users. And therefore require disclosure in the financial statements, regardless of the numerical impact

What are the key aspects of New Zealand's proposed climate reporting regime?

The key aspects of the proposed climate-related financial disclosures reporting regime include:

- The adoption of principles-based mandatory (comply-or-explain) climate-related financial disclosures, with the TCFD reporting framework being the default 'comply'.
- The mandatory (comply-or-explain) reporting regime would come into effect for financial years commencing on or after six months after the regulations are introduced.
- The disclosure requirements would apply to: listed issuers, registered banks, licenced insurers and investment managers.
- After the first year, non-disclosure would only be allowable on the basis of a preparer's analysed and reported conclusion that they see themselves as not being materially affected by climate change, with an explanation as to why.

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ED None

This report is intended solely for the information and use of the Audit and Risk Committee, other members of the Council and senior management of Gisborne District Council, and should not be used for any other purpose nor given to any other party without our prior written consent. We disclaim all responsibility to any other party for any loss or liability that the other party may suffer or incur arising from or relating to or in any way connected with the contents of this report, the provision of this report to the other party or the reliance upon this report by the other party.

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Te Kaunihera o Te Tairāwhiti
GISBORNE
DISTRICT COUNCIL

Title:	**23-53 Council Strategic Risk Management Report**
Section:	Finance & Affordability - Performance
Prepared by:	Daniel Haverty - Risk Advisor
Meeting Date:	Wednesday 15 March 2023

Legal: No	Financial: Yes	Significance: **Low**

Report to AUDIT & RISK/ĀRAI TŪRARU ME TE TĀTARI KAUTE Committee for information

PURPOSE - TE TAKE

The purpose of this report is to inform the Audit & Risk (A&R) Committee on the status of Council's strategic risks.

SUMMARY - HE WHAKARĀPOPOTOTANGA

Management continues to review and monitor Council's strategic and organisational risks and apply the risk appetite framework to each area of risk to assess their inherent risk, the control environment to manage that risk and the resulting residual risk level.

This report provides updates for:

- Civil Defence and Emergency Management (CDEM)
- Health and Safety (H&S)
- People and Capability (P&C)
- Finance (F), and Fraud and Corruption (F&C)
- Procurement (P)
- Legal Compliance (LC)
- Natural Environment (NE)
- Asset Management (AM)
- Business Continuity (BC) strategic risks

Within the Public Excluded part of the Audit & Risk agenda there is a deep dive on the Civil Defence and Emergency Management response to Cyclone Gabrielle **[23-64].** This will be followed by a strategic risk workshop for all Councillors.

The decisions or matters in this report are considered to be of **Low** significance in accordance with the Council's Significance and Engagement Policy.

RECOMMENDATIONS - NGĀ TŪTOHUNGA

That the Audit & Risk/Ārai Tūraru me te Tātari Kaute Committee:

1. Notes the contents of this report.

Authorised by:

Pauline Foreman - Chief Financial Officer

Keywords: strategic risk, risk appetite, deep dive civil defence emergency management,

BACKGROUND - HE WHAKAMĀRAMA

1. This report provides an update on Council's strategic risk activities for the period ending March 2023.
2. Council is progressively applying the risk framework to each of the Council's 13 identified strategic risks. Each strategic risk will be assessed in terms of inherent risk, the control environment to manage that risk, and the resulting residual risk.
3. Work is being undertaken across all the strategic risks and the Strategic Risk Update Summary Table below shows the completed risk assessments to date and where the risk assessments and deep dives for each risk are proposed.

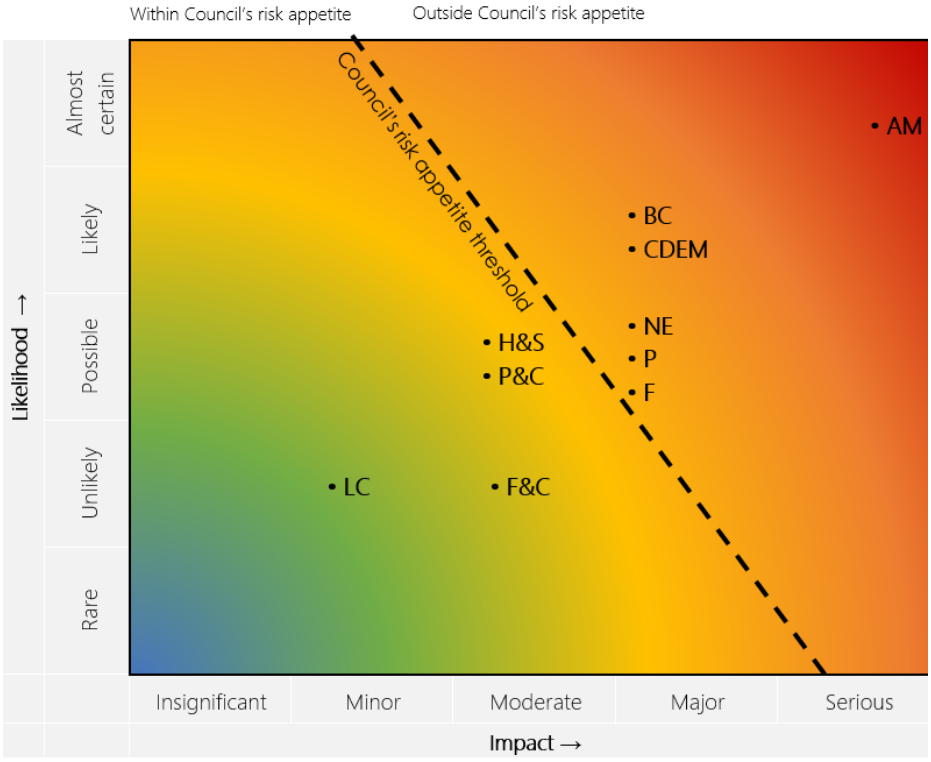
Strategic Risk Update Summary Table

Strategic Risk	Inherent Risk	Residual Risk	Proposed Deep Dive	Risk Assessment completed
Health and Safety	Serious	Moderate	**Completed**	**Completed**
Civil Defence	Serious	Major	**Completed**	**Completed**
People and Capability (including projects/change management and service delivery)	Serious	Moderate	**Completed**	**Completed**
Impact of Externally Driven Change	New risk: level to be determined following deep dive	New risk: level to be determined following deep dive	**Completed**	tbc
Overall Council Strategy (including strategic relationships)	To be reassessed following deep dive	To be reassessed following deep dive	tbc	tbc
Treaty Commitments	New risk: to be determined following deep dive	New risk: to be determined following deep dive	tbc	tbc
Financial (including fraud and corruption)	Serious (Major)	Major (Moderate)	**Completed**	**Completed**
Capital Projects	Major	Moderate	tbc	**Completed**
Natural Environment (including ability to monitor and report)	Major	Major	tbc	**Completed**
Legal Compliance	Minor	Minor	tbc	**Completed**
Infrastructure Asset Management	Serious	Serious	tbc	**Completed**
Procurement	Serious	Major	**Completed**	**Completed**
Business Continuity (including Information and Technology (IT))	Serious	Major	**Completed**	**Completed**

4. The table below shows the change in Residual Risk Levels for the assessed strategic risks from the previous 23 November 2022 risk report to A&R to this current report (15 March 2023). A further residual risk 'heat map' is also provided below for the risks assessed to date: 'Civil Defence Emergency Management' (CDEM); 'Health and Safety' (H&S); 'People and Capability' (P&C); 'Finance' (F); 'Fraud and Corruption'(F&C); 'Procurement' (P); 'Legal Compliance' (LG); 'Natural Environment' (NE) 'Asset Management' (AM); and Business Continuity (BC). More risks will be added to the heat maps as they are assessed.

Strategic Risk Assessed	**Previous Risk Level** (23 Nov 2022)	**Change**	**Current Risk Level** (15 March 2023)
Civil Defence and Emergency Management (CDEM)	**Major**	↔	**Major**
Health and Safety (H&S)	**Moderate**	↔	**Moderate**
People and Capability (P&C)	**Major**	↘	**Moderate-**
Finance (F)	**Major**	↔	**Major**
Fraud and Corruption (F&C)	**Moderate**	↔	**Moderate**
Procurement (P)	**Major**	↔	**Major**
Legal Compliance (LG)	**Minor**	↔	**Minor**
Natural Environment (NE)	**Major**	↔	**Major**
Asset Management (AM)	**Serious**	↔	**Serious**
Business Continuity (BC)	**Moderate**	↗	**Major**

Residual risk heat map



DISCUSSION and OPTIONS - WHAKAWHITINGA KŌRERO me ngā KŌWHIRINGA

Civil Defence Emergency Management (CDEM) Strategic Risk

5. The Civil Defence Emergency Management (CDEM) strategic risk is defined as the risk that the CDEM Group '*is unable to provide appropriate response and recovery operations.*'

6. The current residual risk level for CDEM is assessed as '**Major**', which is outside our overall Council risk appetite of 'Moderate'.

7. This 'Major' level of risk has been arrived at because of the increasing number of declared events of increasing intensity, coupled with the CDEM function being situated in a building in the Tsunami Inundation Zone.

8. The latest declared event, Cyclone Gabrielle, has presented several challenges – including being isolated with both the north and south roading access being cut off; loss of power for a short period and no cell phone or internet access for an extended period which severely impacted our ability to communicate and for the community to access essential food and fuel services.

9. Meanwhile, construction has started on an alternative new CDEM building outside the Tsunami Inundation Zone. While there is a heightened risk to CDEM operations until the new building is available, there are contingencies in place for moving CDEM functions to an area outside of the Zone as a temporary measure. The new building is scheduled to be complete around June 2023.

10. Operationally, the increased frequency and intensity of weather events has challenged Council's ability to meet its CDEM commitments. The region has experienced 5 significant events this year and 2 the previous year, including Cyclones Hale and Gabrielle in January and February 2023. The latter two Cyclones cut significant lifeline assets and communication capabilities, isolating communities for extended periods with limited resources and connectivity. It is intended that there will be a deep dive into the constraints and on adapting to changing circumstances because of the experiences of these events in the Public Excluded section of the Committee meeting.

11. Due to these increased weather events, there is an emerging risk in our ability to respond and recover from continued events which stretch resources and prolong recovery, leaving little time for forward planning. If trends continue, increased resourcing may be required to meet demands. There is an associated effect on Business Continuity, as CDEM functions are filled by Council staff.

12. The increased number of events has reduced CDEM's ability to facilitate regular scheduled trainings. Instead, these events are providing real-time training and experience to staff and the CDEM operational team.

13. A Welfare Manager FTE vacancy has been filled, completing a treatment option proposed. The Welfare Manager has been in operation in the events this year and seconded to Auckland to support their CDEM following the January storms.

14. A recovery FTE vacancy has been filled which addresses the control for a Recovery Manager and increases the effectiveness in managing recovery response operations.

15. The treatment option to support to volunteers to sustain efforts in the field, such as through Community Links, has become BAU in response.

Health and Safety (H&S) Strategic Risk

16. The Health and Safety (H&S) strategic risk is defined as 'the inability to adequately protect Council staff and the community, from hazards or events where reasonably practicable to do so'[2].

17. The current residual risk level for Health and Safety is assessed as '**Moderate**' which is within Council's overall risk appetite.

18. This assessment is based on the continued delivery of Health and Safety training for new staff, continued monitoring and adjustment of how Council delivers its services that it removes and minimises its operational risk to the community; and additional monitoring and management of risks to staff arising from the response to Cyclone Gabrielle.

19. Health and Safety representatives have been trained across Council which completes one of the treatment options identified to create a more mature health and safety culture within Council.

People and Capability (P&C) Strategic Risk

20. The People and Capability (P&C) strategic risk is defined as 'the Council does not have the right people with the right skills and attitudes.'

21. The current residual risk level for People and Capability is assessed as '**Moderate**,' based on our current turnover level of 16.6%, which is within Council's overall risk appetite threshold of 15-17%.

22. Council's response to this risk is identified in **Report 22-24** which is continuing to have a stabilising effect on our attrition rate. The national shortage of talent is continuing to contribute to the difficulty in attracting talent to fill the roles available. Council will continue introducing additional actions to attract and retain talent while using contracted personnel and consultants where possible to maintain service delivery.

23. An additional treatment action taken to improve this turnover figure that returns this strategic risk back within Council's risk appetite has been the employment of a dedicated inhouse recruiter supported by the wider People and Capability team.

Finance (F) Strategic Risk

24. The Finance strategic risk is defined as 'failure to be financially sustainable.'

25. The current residual risk level for **Finance** remains at '**Major**' which is outside Council's overall risk appetite.

26. This 'Major' level of risk is both a continuation of management taking a prudent approach to Finance given the current uncertainty in the financial operating environment due to inherent high inflation, higher interest rates, and rising risks from externally driven factors, such as Three Waters Reform, which would raise residual debt levels; and in response to the latest declared CDEM response to Cyclone Gabrielle and it's significant damage to Council infrastructure, the cost of which to repair is still to be fully determined.

[2] Reasonably practicable is defined in terms of Health and Safety Act 2015 Section 22 – and includes what a person ought reasonably to know about the risk or hazard, ways of eliminating or minimising the risk, and the costs of ways to eliminate or minimising the risk (whether the cost is grossly disproportionate to the risk).

27. The assessment to move to 'Serious' is under review. Final assessment will occur after Central Government funding announcements and in conjunction with Waka Kotahi for reinstatement or reassessment of roading options for our network.

28. This approach seeks to minimise the impact of an economic or financial shock and whilst this is outside Council control and is not something we have experienced yet; the assessment is that this is now likely given the impact of Cyclone Gabrielle. Therefore, further actions are being taken to manage the impact of this event. Additional actions were put in place in **Report 22-102** to bring the residual risk back from Major to within Council's risk appetite, as discussed below.

    a. **Treasury:** Increased monitoring and cashflow forecasting, close monitoring of interest rate movements to cover requirements, ability to reprioritise spending (case-by-case assessments), scenario modelling: **Complete, controls present and effective.**

    b. **Insurance:** Group interest rate strategy review that policies are adequate and that the claims process is underway in response to the severe weather event of Cyclone Gabrielle: **In Progress, controls present and effective.**

    c. CCTO liabilities: Review of CCTO operation and activity: **In Progress.**

Procurement (P) Strategic Risk

29. The Procurement strategic risk is defined as 'failure to optimise the supply of cost-effective & quality goods and services over the long term.'

30. The current residual risk level for Procurement remains as 'Major' which is outside Council's overall risk appetite.

31. This 'Major' level of risk is a continuation of management taking a prudent approach to procurement within Council's financial operating environment, given the on-going pressures in the wider business environment through inflation, supply chain disruption and labour shortages, and the extended impact of repeated weather events on the region. Ongoing business practices are in place to manage this risk, including reviewing 'design and build' procurement strategies on planned projects, a review of supply and contractor resources, and rationalism planning when project resources reach a critical level. These actions were introduced (**Report 22-252**) to manage the impact if a procurement risk event were to occur.

Fraud and Corruption (F&C) Strategic Risk

32. The Fraud and Corruption strategic risk is defined as 'wrongful or criminal deception for personal gain.'

33. The current residual risk level for **Fraud and Corruption** remains assessed as '**Moderate**' which is within Council's overall risk appetite.

34. Council has increased the number of qualified tender evaluators, which has increased fraud awareness and improved the rigour of the tender process.

35. Fraud training and awareness sessions are ongoing, with upcoming sessions facilitated by Deloitte.

Legal Compliance (LC) Strategic Risk

36. The Legal Compliance risk is defined as 'legal and policy non-compliance'.

37. The current residual risk level for **Legal Compliance** is assessed as '**Minor**' which is within the Council's overall risk appetite.

38. An additional treatment was introduced in **Report 22-252** to establish a compliance register to complete documentation and reporting of legal compliance. Systems and software options are being investigated to find a fit for purpose model. Early investigations indicate system implementation could be resource intensive, so additional resourcing may be required to support adoption of an appropriate system.

39. Operationally, the Council is meeting its legal compliance commitments, with areas where further improvement can be made to deepen its risk maturity practices identified.

Natural Environment (NE) Strategic Risk

40. The Natural Environment strategic risk is defined as 'failure to sustainably manage our natural environment under Council control.'

41. The current residual risk level for Natural Environment is assessed as '**Major**' which is outside the Council's overall risk appetite of 'Moderate.'

42. This assessment was based on current resourcing issues which are being addressed through the wider improvement in recruitment outcomes under the 'People and Capability' strategic risk.

43. However, there is an emerging risk to the operating environment Council is now required to work under because of the impact of repeated extreme weather events the region has experienced on the natural environment and the region's infrastructure. The full impact of this changed environment on Council's ability to deliver services and to adapt those services to meet the changed physical environment, while managing the replacement of lost infrastructure in a way that provides future resilience is still to be determined, including the full cost of completing this work.

Asset Management (AM) Strategic Risk

44. The Asset Management risk is defined as 'Failure to provide fit for purpose, safe, affordable & sustainable assets that the community expects, over the long-term'.

45. The current residual risk level for Asset Management is assessed as '**Serious**' which is outside Council's overall risk appetite.

46. This assessment was previously based on the impact of recent significant flooding events reducing the resilience of the Council roading network, and the additional costs being incurred by Council to restore and maintain an effective local roading network being beyond the Council's current budget provisions. This situation has been further exacerbated by the damage caused by Cyclone Gabrielle both to the already damaged roading network and to stop banks and water infrastructure providing water to residents and industry.

47. While the full impact and extent of the damage is still being determined it is clear that the region's, and Council's, infrastructure will remain damaged and vulnerable for an extended period. An immediate consequence is the risk of an unaffordable rate increase, with a negative impact on levels of service while the Council works to restore damaged infrastructure in a way that provides greater future resilience.

48. In response, management are working with central government, local industry and contractors on emergency repairs to as much of the roading infrastructure as possible, as quickly as possible, and while providing emergency water supplies while the main water supply is restored. In the meantime, further planning is underway on the long-term restoration of this infrastructure that it will be more resilient to future extreme weather events.

49. Regarding the Council's community assets, the residual risk level is assessed as 'Moderate,' which is within Council's overall risk appetite. Following Cyclone Gabrielle, initial assessments identify increased costs for Community housing and Council reserves and play spaces which may exceed current budget provisions. The full extent of these costs is currently being determined.

Business Continuity (BC) Strategic Risk

50. The Business Continuity (including Information and Technology) strategic risk is defined as 'The Council is unable to provide critical services within appropriate timeframes.'

51. The current residual risk level for Business Continuity is assessed at '**Major**' which is outside Council's overall risk appetite.

52. This assessment is based on the immediate disruption and damage to Council services and infrastructure and the diverting of Council personnel in response to the CDEM Cyclone Gabrielle emergency rather than carrying on business as usual, and on the longer-term disruption to the delivery of Council objectives as Council and the region seeks to recover from the impact of the cyclone.

53. While Business Continuity Plans are in place across all Hubs of the Council and are regularly updated to reflect staff and structural changes, they are only intended to be in place for a short period of time whereas the Council is facing an extended period of disruption while key infrastructure is restored including a significant period of uncertainty while it is determined what this key infrastructure will look like that there is confidence in its resilience.

54. The Council is meeting its information and technology commitments and increased resilience is anticipated when the new CDEM structure is in place this year.

55. As identified under the CDEM strategic risk, Cyclone Gabrielle tested Council's Business Continuity in a situation where communications were lost or reduced to a bare minimum for a week. Council was able to establish early communications at the Awarua facility and with community CDEM centres using Starlink and radio. While Council is in emergency response mode, the ability to deliver other cores services of Council is reduced including the ability to provide critical services within appropriate timeframes.

56. Given the severity of the impact of Cyclone Gabrielle on Council infrastructure, the region's economic base and wider community facilities and wellbeing consideration should be given to re-assessing the focus of Council strategies and operational delivery programmes including the upcoming Annual and Long Term Plans and with particular attention being paid to the CDEM Recovery Plan given its importance in addressing how this Council and the region responds to the damage that has been incurred by Cyclone Gabrielle.

Capital Projects (CP) Strategic Risk

57. The Council has several major projects underway that are reported to the Operations Committee. Two of these major projects involve significant external funds from central government. These two projects are the Wastewater Treatment Plant upgrade (WWTP) $37.23m and the Kiwa Pools Aquatic Centre project (Kiwa Pools) $47.5m (including $40m of central government funding and additional grants of $1.4m approved this year for solar panels and the hydrotherapy pool).

58. Council management involvement from an internal audit and risk assurance perspective is to provide assurance to Councillors, our project sponsors and funders that expenditure is being recorded and allocated correctly and that any funding claimed is correct and based on actual expenditure incurred.

59. This work extends to project forecasting and cash flows that help identify any issues or concerns around project timing, tracking against budget and project milestones for project completion and to meet funding requirements.

60. Management does this in several ways:

    a. Each project has a dedicated financial advisor that works closely with the project team in monitoring spend, forecasting, cash flow and funding management.

    b. Internal Audit review and sign-off on the financial information before the information is released to our funders.

61. The costs to date for the Kiwa Pools are $39m. The council has received all the funding for all milestones completed to date.

62. The costs for the WWTP are $29.9m, $7.5m of funding from Crown infrastructure partners has been received.

63. The risk assessment of these two projects for the purpose of this report has considered their delivery against budget, scheduled completion date and scope of work. At this stage of delivery, both projects are assessed as being within Council's risk appetite as follows:

    a. The Wastewater Treatment Plant upgrade is being delivered within budget and to the scope of work intended. The completion date will be May 2023. This is mostly within original timeframes, but there have been some slight delays primarily due to COVID-19 restrictions, supply chain delays and delays caused by significant weather events in April.

    b. The Kiwa Pools project is being delivered within budget and to the scope of work intended.

General Risk Management

64. Prior to Cyclone Gabrielle management had been working through the new strategic risks of 'Impact of External Change' and 'Treaty Commitments' to better define the nature of their risk to the Council, and how they relate to, or impact on, the existing risks of 'Overall Council Strategy' and 'Strategic Relationships.'

65. The residual impact on Council of the damage caused to the region and to Council infrastructure by continuous extreme weather events culminating in Cyclone Gabrielle supports Council taking time to re-assess what our main risks now are and how that impacts primarily on Council's 'Overall Council Strategy' risk and how our risk profile has changed or will now affect Council's ability to achieve its strategic objectives.

66. The widespread damage incurred and its impact on our wider community means that immediate considerations regarding the Annual Plan have changed, as have those for the Long-Term Plan, both of which will inform and be informed by the Recovery Plan being put in place to assist the region's 'reset, resilience and re-build' agenda.

67. While the full impact of Cyclone Gabrielle is still being assessed, key Council roading, water and stop bank infrastructure has been severely compromised. Significant management time and resources will need to be dedicated to this recovery work, the cost of which to ratepayers is still to be determined but is likely to be significant. Insurance will cover a portion of these costs and again this poses an area of risk to Council as we determine what costs are covered by insurance and which are not.

68. Additional expertise may be required to work through how infrastructure can be restored as cost effectively as possible while building in greater resilience to future events.

69. Prior to Cyclone Gabrielle Council had identified 13 Strategic Risks (with 4 associated sub-risks). A workshop was proposed for 15 March to re-visit these risks to better define and rationalise Council's risk profile and while this workshop will continue as scheduled, the focus will move to re-cut our risk profile and re-determine our top risks given the constraints we will be working under and what is important to our community for Council to focus on.

70. Given the impact on our community, considerations include whether it is still appropriate to enter the scheduled consultation on the next 3 years of the Long-Term Plan or is it better to develop an interim 3-year plan with a focus on the event recovery programme that restores this community's ability to participate and contribute to the Long-Term Plan following.

71. Given the impact of Cyclone Gabrielle on Council's ability to function effectively, what is a credible response for Council in the immediate aftermath that enables both the Council and our community to find their feet and develop a way forward that maximises the value of recovery resources being made available, both in the short-term and for building back differently to create a more prosperous and resilient community.

72. These considerations will be canvassed during the workshop which will be facilitated by PwC, who facilitated the previous strategic risk workshop.

ASSESSMENT of SIGNIFICANCE - AROTAKENGA o NGĀ HIRANGA

Consideration of consistency with and impact on the Regional Land Transport Plan and its implementation
Overall Process: **Medium** Significance
This Report: **Low** Significance

Impacts on Council's delivery of its Financial Strategy and Long-Term Plan
Overall Process: **Medium** Significance
This Report: **Low** Significance

Inconsistency with Council's current strategy and policy
Overall Process: **Medium** Significance
This Report: **Low** Significance

The effects on all or a large part of the Gisborne district
Overall Process: **Medium** Significance
This Report: **Low** Significance

The effects on individuals or specific communities
Overall Process: **Medium** Significance
This Report: **Low** Significance

The level or history of public interest in the matter or issue
Overall Process: **Medium** Significance
This Report: **Low** Significance

73. This report is part of a process to arrive at a decision that will/may be of **Low** level in accordance with the Council's Significance and Engagement Policy

74. This report is part of the Council risk management process and will inform future Council decision-making across Council functions and therefore the level of significance will be informed by the functions this process is applied to.

TANGATA WHENUA/MĀORI ENGAGEMENT - TŪTAKITANGA TANGATA WHENUA

75. The level of engagement has primarily been internally facing to date as the areas of risk are identified. This will then inform the level of engagement required and process for engagement to be followed.

COMMUNITY ENGAGEMENT - TŪTAKITANGA HAPORI

76. The outcomes of determining the Council's strategic risks and risk appetite for each will inform Council's decision-making and the allocation of resources to deliver the Long-Term Plan objectives supported by an appropriate risk management strategy and approach.

77. The level of community engagement will be determined by the areas of risk identified and the degree to which they directly affect the community.

CLIMATE CHANGE – Impacts / Implications - NGĀ REREKĒTANGA ĀHUARANGI – ngā whakaaweawe / ngā ritenga

78. The level of climate change impact and its implications will be determined by the areas of risk identified and the extent to which they affect climate change.

CONSIDERATIONS - HEI WHAKAARO

Financial/Budget

79. The financial impact will be determined by the resource allocation required to meet Council's risk appetite for the areas of risk identified.

Legal

80. This report is part of Council's obligations to operate in a prudent manner by identifying and reducing relevant risks to the delivery of its services and activities.

POLICY and PLANNING IMPLICATIONS - KAUPAPA HERE me ngā RITENGA WHAKAMAHERE

81. This report is consistent with Council's Risk Management Framework.

RISKS - NGĀ TŪRARU

82. This report is part of Council's wider organisational risk management process which seeks to minimise risk across the Council organisation. The process being undertaken as set out in this report will be applied to map the rest of the strategic risks.

NEXT STEPS - NGĀ MAHI E WHAI AKE

Date	Action/Milestone	Comments
15 March 2023	Workshop – Risk Appetite & Reset or confirm primary Strategic Risk	Workshop to review Council's Primary Strategic Risks & Risk Appetite.
March onwards	Determine if the Council is currently exposed to any risks beyond its risk appetite.	Complete in conjunction with Internal Audit for the Assurance Programme. Reported within Audit & Risk Committee
March onwards	Develop the internal audit plan.	Complete in conjunction with the profiling of each strategic risk and subject to further consideration by Audit & Risk Committee
March onwards	Plan and conduct deep dive risk sessions with the Audit & Risk Committee.	Complete in conjunction with Internal Audit for the assurance programme. Reported within Audit & Risk Committee.

Te Kaunihera o Te Tairāwhiti
GISBORNE
DISTRICT COUNCIL

23-55

Title:	**23-55 Insurance Renewal Update**
Section:	Finance & Affordability - Performance
Prepared by:	Andrew Haughey - Senior Procurement Advisor
Meeting Date:	Wednesday 15 March 2023

Legal: No	Financial: Yes	Significance: **Low**

Report to AUDIT & RISK/ĀRAI TŪRARU ME TE TĀTARI KAUTE Committee for information

PURPOSE - TE TAKE

The purpose of this report is to provide an update on the renewal of Council's insurance policies for 1 November 2022 to 31 October 2023 and to update the actions arising from the Insurance Strategy. An update on the claims process for Cyclone Gabrielle has also been included in this report.

SUMMARY - HE WHAKARĀPOPOTOTANGA

Insurance Renewals for 2022/23

Council continues to purchase its insurance as part of the Bay of Plenty Local Authority Share Services (BOPLASS) group of Councils.

Insurance cover for material assets is separated into above ground cover (buildings, equipment, motor vehicles) and below ground cover (water infrastructure and flood protection). Liabilities insurances (public, professional indemnity, statutory and employer) form the other main insurance groups of cover.

The annual premium is $1.57m, up $257k (or 20%) compared to last year. This increase is driven mostly by the increased asset values.

The key policy movements are:

- Council Buildings (Above Ground Assets) increased in value by 29%.
- Three Water Infrastructure (Below Ground Assets) increased in value by 23%.
- Council as a total of $928m of insured declared assets.
- Significant material new assets were added, including the Kiwa Pools and the Wastewater Treatment Plant.

Insurance Strategy

Council adopted the Insurance Strategy in September 2021 **Report 21-137**. As part of this strategy, two critical actions arose:

- Appropriate valuation method for insurances were to be applied.
- An earthquake probable maximum loss assessment for infrastructure assets was to be undertaken.

Both critical actions have been completed.

The 2022/23 insurance renewals valuation, undertaken by an external valuer, resulted in an increase of upwards of $47m for insurance reinstatement purposes. This increase was mainly in the Four Waters Assets.

A comprehensive earthquake probable loss analysis for Council's infrastructure assets was completed in February/March 2023. This report updated loss estimates from the 2017 study where the median 1 in 500-year probable maximum loss rose from $186m to $293m. Currently, Infrastructure insurance policy has a maximum loss of $250m. The pricing of increased cover for maximum loss is currently underway with our insurers.

The full report is provided in **Attachment 1**.

Cyclone Gabrielle

Cyclone Gabrielle has had a significant impact on Council's assets and work to assess the level of loss is continuing. Councils' insurance policies which have been most impacted so far are our Infrastructure, Material Damage and Business Interruption policies.

Councils' insurance broker will attend this Committee meeting via Zoom and will provide an update on our insurance policies and the insurance market. They will be available to answer any questions.

The decisions or matters in this report are considered to be of **Low** in accordance with the Council's Significance and Engagement Policy.

RECOMMENDATIONS - NGĀ TŪTOHUNGA

That the Audit & Risk/Ārai Tūraru me te Tātari Kaute Committee:

1. **Notes that:**
   a. **An amendment is underway to Council's Infrastructure Insurance maximum probable loss relating to median 1 in 500-year earthquake event, moving from the existing $250m to $293m. This will be subject to our insurers finding underwriters.**
   b. **Future updates to the Audit & Risk Committee will be reported over options for maximum probable loss for Councils infrastructure – including higher risk certainty (i.e. 90% at 1 in 500-year event) and median range for a 1 in 1,000-year event.**

Authorised by:

Pauline Foreman - Chief Financial Officer

Keywords: Council insurance, insurance renewal process, insurance strategy, Cyclone Gabrielle

BACKGROUND - HE WHAKAMĀRAMA

Insurance

1. Insurance is one way to manage the risk of an event or action that will adversely affect Council's ability to achieve its objectives and execute its strategies successfully.
2. Council continues to purchase its insurance as part of the shared services offered by being part of the Bay of Plenty Local Authority Shared Services (BOPLASS) group of Councils. The LASS model now includes 66 local authorities in five groups based on geography and risk profile. The model proves to be a sustainable and cost-effective approach to securing annual insurance coverage.
3. Insurance cover for material assets is separated into above ground cover (buildings, equipment, motor vehicles) and below ground cover (water infrastructure, flood protection). Typically, our below ground cover has been secured via London insurers, with above ground cover being provided by local markets.
4. Liability insurances (public, professional indemnity, statutory, employer) form the other main group cover.
5. Attached are;
    a. **Attachment 1 -** Assessment of Potential Earthquake loss to Three waters Infrastructure Assets.
    b. **Attachment 2 -** 2022 2023 Insurance Policy Descriptions.
    c. **Attachment 3 -** 2022 2023 Asset Insurance Coverage or Exclusion.
    d. **Attachment 4 -** Insurance Strategies – Action Status and timelines.
6. Due to changes in insurance markets, our Insurers are now having to price in the impact of increasing instances of large-scale natural hazard and weather-related events. This is in addition to inflationary impacts driving larger claims.
7. Council's insurer will provide an update on the markets and potential future impacts on insurance cover, in light of the declared national emergency as a result of Cyclone Gabrielle, at this meeting.

DISCUSSION and OPTIONS - WHAKAWHITINGA KŌRERO me ngā KŌWHIRINGA

2022/23 Insurance Renewal

8. Across the board revaluations have driven an increase in asset values, causing an overall increase in insurance premiums.
9. Council has $928m of declared assets insured for 2022/23 with an annual premium of $1.57m.

10. Council has 15 polices in place as part of this process. The three main polices, accounting for 83% of Councils insurance spend, are:

    a. Infrastructure Assets (Below Ground Assets)

    b. Material Damage for Above Ground Assets (including water treatment and the wastewater plants)

    c. Public Liability and Professional Indemnity

Table 1: Council's Insurance Schedule: 1 November 2022 – 31 October 2023

	2022/23	Last year (2021-22)
Policy	**$000's**	
Material Damage Fire Only & Business Interruption	659	489
Infrastructure (below ground assets)	348	310
Harbour Master	80	78
Marine Hull Policy (for the boat)	1	1
Crime	17	17
Corporate Travel	4	1
Personal Accident	20	20
Motor Vehicle	32	26
Statutory liability & Employers Liability	11	10
Excess layer Liability and extension invoice	41	40
Public Liability & Professional Indemnity	292	266
Forestry	2	2
Machinery Breakdown	9	8
Cyber	22	19
Waingake Manuka Plants 256 ha (New Policy)	5	0
AON Brokerage fee	31	31
Total	**1,574**	**1,317**

11. Up until 2022/23, Councils assets have been valued at Market Valuations. Market valuations consider both the value of land and the buildings located on the property at a point in time. An insurance valuation on the other hand, determines the total sum of your insurance policy, which is the maximum amount that can be claimed. It is primarily concerned with the damaged assets full replacement costs for the future period under cover.

12. Councils Four Water assets were assessed for insurance valuation purposes by an external valuer. There was a $47m increase in overall value from the market valuation. The extra $47m was approved by international underwriters on 12 December 2022 and the additional cover is placed for 2022/23.

Table 2: Council's Declared Assets

Assets	Declared Assets 2023/22	Declared Assets 2022/21
	$m	
Material Damage	342	265
Infrastructure	586	489
Total	**928**	**753**

Table 3: Summary Council's insurance cover 2022/23

Policy	Commentary of changes for 2022/23
Material Damages	The Material Damage premium increased 35% due to declared assets increasing by 29% with new valuations.
Infrastructure	The infrastructure premium cost increased by 12% and declared assets rose by 20% this year, which included adding an insurance valuation that included reinstatement, demolition and construction inflation costs.
Harbourmaster/Wreck removal	Continues to be at limit of $10m wreck removal cover. This will be reviewed during the coming year once the planned Twin Berth expansion project at the Port is completed, as the shipping movements are expected to increase along with its doubled capacity.
Waingake Manuka Cover	Effective from March 2023 to align with the majority of completed native plants at Waingake, 56ha is insured for a maximum of $5,000 per hectare for establishment costs on Council land (i.e. in an event of natural disasters or fire). Recent legislative changes effective from 1 January 2023 have resulted in an exemption from carbon liabilities for temporary adverse events such as a flood or fire. As such there is no need for a policy to cover any potential ETS liabilities as result of an adverse event. Damage to a neighbouring property from a fire starting on Council land falls under a Public Liability policy.
Cyber	The Cyber insurance premium increased by 15% due to the continued increased potential of cyber-attacks.

Insurance Strategy

13. Council adopted the Insurance Strategy (Strategy) at the Audit and Risk Committee meeting on 22 September 2021 (**Report 21-137)**. The adopted Strategy includes tasks to review and assess risk, governance practices, culture, decision-making and systems in the following areas:
    a. Property (First party asset exposures, including business Interruption).
    b. Liability (Third party liability exposures).
    c. Technology (First and third party cyber exposures).
    d. Retention (Risk tolerance, retained risk and available risk financing tools).
14. The Strategy identified five key strategies within the risk profiling process, which are to be reviewed and updated on a three yearly cycle.

Table 4: Insurance Strategy Key

Table 3 Key Strategies		
No.	**Strategy**	**Risk Profile**
1	Appropriate valuation methods for insurance.	Critical
2	Undertake earthquake probable maximum loss assessment for infrastructure assets.	Critical
3	Update insurance schedule and approaches (eg. low value property).	Major
4	Review the risk retention (or residual financial exposure).	Major
5	Review Enterprise Risk Management framework and processes.	Major

Key	
Critical	Prioritise for **first year** of work plan. Impacts most significant policies by premium spend.
Major	Will be prioritised for **second year** of work programme.

15. The appropriate insurance valuation for Four water assets (Number 1 Key Insurance Strategy) has been completed and has been incorporated in the 2022/23 Insurance asset schedule under the Infrastructure Assets Policy.

Earthquake Probable loss Study

16. Our Infrastructure Material Damage Policy (below ground assets) is intended to cover natural disaster situations, and as such they have high deductibles ($1.5m). This policy has a loss limit (i.e. a maximum pay-out regardless of damage) which is set based on the expected losses to the portfolio, the availability of market capacity to underwrite the losses, and the premiums associated with the cover.
17. In 2017 a study was undertaken to determine the Councils loss limit. At that time, it was set at $186m based on median loss from an earthquake (modelled on a 1 in a 500-year event).

18. The current loss maximum is $250m. This sub-limit applies to all natural disasters, not just earthquakes, as a 'Natural Catastrophe Event' can include: Earthquakes, Natural Landslips, Floods, Tsunamis, Tornados, Windstorms, Volcanic Eruptions, Hydrothermal & Geothermic Activity, and Subterranean Fire.

19. Council's loss limit is expressed in 100% gross amounts. The Infrastructure Policy assumes it will cover 40% of the total costs, with the remaining 60% covered by Central Government.

20. The Insurance Strategy identified that our loss limit was a critical risk and a review should be undertaken. The review has been completed and the full report is attached as **Attachment 1.**

21. It is noted within the attached report that due to the proximity of the Gisborne region to the Hikurangi margin (the area where the Pacific Plate subducts below the Australian Plate), the tectonic regime is active, and the resultant seismic hazard is considered high.

Table 5: Probable Loss maximum

Year	Declared 3Waters	1/500yr Median loss from an Earthquake
2016	$449m	$186m
2023	$586m	$293m

22. Some key findings in the report were based on declared infrastructure assets at $586m:
    a. 1/500 year Severe Earthquake has median loss limit of $292.8m.
    b. 1/1000 year Severe Earthquake has a median loss limit of $457m.

23. Council is in the process to arrange pricing for the increased loss limits with our Insurance Broker. As soon as this has been completed, the policy cover for 2022/23 will be updated.

Remaining Key Insurance Strategies (3-5)

24. **Attachment 4** outlines the status of each of the Key Insurance Strategies and the timelines of the tasks. Updates as to the progress of these strategies will be reported at future Audit & Risk Committee meetings.

Cyclone Gabrielle, Insurance Cover and Central Government

25. Report **23-58** to Extraordinary Council meeting on 2 March 2023 outlined the initial damage caused to Councils Water assets, the relationship of Central Government funding and our insurance policies. It stated that under declared emergency events such as Cyclone Gabrielle, the National Emergency Management Agency (NEMA) will cover up to 60% of damage to critical insured water infrastructure assets. For the remaining 40% of costs, these will be assessed by our loss assessors under the Infrastructure Below Ground Material Damage Policy.

26. The report also noted that Council does not insure the local roading network (i.e. roads and bridges), where any local share not funded by Waka Kotahi must be funded by Council. The process for assessing damage and the funding for the roading network will be completed within the following months.

27. Below is a summary of the insured assets, the cover and the process that is currently underway.

28. The main Council Assets which have been affected by Cyclone Gabrielle are:

Material impacts:

- The Waingake Pipeline.
- The Waipaoa Treatment Plant (business interruption).
- River Stop banks (4 identified).

Minor damage

- Telemetry.
- Community Flats in Tairāwhiti.
- Wastewater and Stormwater infrastructure minor damage.
- Community Halls, mainly in Te Karaka.

29. Council Deductible amounts on Insurance Policies:

    a. Infrastructure assets have $1.5m.

    b. Material Damage assets have a $25k.

    c. Business Interruption is $25k.

30. A Loss Assessor for the insurers has visited the damaged infrastructure sites. We are in the processes of identifying reinstatement costs which will in turn be reviewed by the loss assessors.

31. At the same time, this process will run alongside our claim with Central Government for 60% of the Four Waters Infrastructure damaged assets.

ASSESSMENT of SIGNIFICANCE - AROTAKENGA o NGĀ HIRANGA

Consideration of consistency with and impact on the Regional Land Transport Plan and its implementation
Overall Process: **Low** Significance

Impacts on Council's delivery of its Financial Strategy and Long-Term Plan
Overall Process: **Low** Significance

Inconsistency with Council's current strategy and policy
Overall Process: **Low** Significance

The effects on all or a large part of the Gisborne district
Overall Process: **Low** Significance

The effects on individuals or specific communities
Overall Process: **Low** Significance

The level or history of public interest in the matter or issue
Overall Process: **Low** Significance

32. The decisions or matters in this report are considered to be of **Low** significance in accordance with Council's Significance and Engagement Policy.

TANGATA WHENUA/MĀORI ENGAGEMENT - TŪTAKITANGA TANGATA WHENUA

33. No tangata whenua engagement was required to complete this report.

COMMUNITY ENGAGEMENT - TŪTAKITANGA HAPORI

34. No community engagement was required to complete this report.

CLIMATE CHANGE – Impacts / Implications - NGĀ REREKĒTANGA ĀHUARANGI – ngā whakaaweawe / ngā ritenga

35. Rising sea levels and extreme weather events are likely to impact future insurance premiums and availability. Over time, material damage insurance premiums are likely to continue to rise, or insurance may be withdrawn for the most at-risk areas.

36. Council will have to consider whether to continue to insure, to self-insure in some form, or to accept higher excess levels or increase limits of liability.

37. The frequency of weather events is also likely to increase, leading to higher exposure to Wreck Removal Cover costs in the future.

CONSIDERATIONS - HEI WHAKAARO

Financial/Budget

38. Total insurance premiums for the period 1 November 2022 to 31 October 2023 are $1.57m, more than what we had planned for within Year 3 of the LTP (up $235k). New estimates were added into the draft Annual Plan 2022/23 as noted within report **23-10** to the Finance & Performance Committee on 2 March 2023.

39. There are a number of significant material assets that will be completed during the 2022/23 insurance policy year. These include the Kiwa Pools and the Wastewater treatment Plant. Contractors' insurance covers the build of these projects up until construction is completed. After that time, they will be added to Council's asset schedule. It is estimated that the total per annum cost will be $141k and provisions have already been made within the draft Annual Plan 2023/24 budgets.

Loss Maximum – Infrastructure

40. The current loss maximum is $250m. The March 2023 study forecasts a probable loss median (based on a 1 in 500 earthquake event) to be $293m. Currently, we are looking to amend our insurance policies to take this increase loss maximum into account.

41. Our material damage policies for below ground assets as noted under the Earthquake Probable loss section has high deductibles ($1.5m). Any losses which fall outside of our deductibles and the "loss limits" of $250m, will need to be covered by loans. A level of headroom is held within our debt ratio limits to maintain an appropriate level of debt capacity should it be required to cover these unforeseen losses. Currently our debt ratio is 130% of revenue, but we have the ability to borrow up to 175%.

Legal

42. Council's Legal team is involved in all Insurance renewals, as well as holding records of historical events and any potential claims.

POLICY and PLANNING IMPLICATIONS - KAUPAPA HERE me ngā RITENGA WHAKAMAHERE

43. With the adoption of the Insurance Strategy and the annual renewal process, individual insurance policies are reviewed regularly. This includes limit exposures (through worst-case loss scenarios), continuing reviewing risk profile, and risk retention and valuation methods for underlying assets.

RISKS - NGĀ TŪRARU

44. Insurance is used as a tool to minimise the risk of financial costs arising from an unforeseen event. The full insurance schedule for 2022/23, with descriptions, deductibles (excess) and limits of liability is provided in **Attachment 2.**

45. There is a risk of Council having high insurance coverage, as the costs of premiums will be borne by today's ratepayers. As such, it does not make sense for Council to insure all our assets. A summary of current assets that are covered and those that are excluded is provided in **Attachment 3**.

46. There is however also a risk of under-insuring, particularly when there is an unforeseen event with high financial impacts to Council, which would mean that future ratepayers will have to bear the costs.

47. Optimising insurance cover requires an Enterprise Risk Management approach. This gives assurance based on the best available information, and the Insurance Strategy provides direction and guidance on Council's response to managing risk.

48. The Enterprise Risk Management (ERM) approach becomes especially important as the cost for insurance cover is likely to be much more expensive after Cyclone Gabrielle, where there is widespread and significant damage across the North Island.

49. Other global disasters may also have an impact on the re-insurance markets, which would affect the rates offered on cover.

50. Some mitigation of these rising costs of insurance cover is to look at other policies that may be within the market. For instance, a "Parametric Insurance" policy could supplement our existing policies. This policy could provide certainty in the immediate aftermath of an event. Parametric policies provide claim payment within 30 days, greatly reducing the time to finalise a claim, and providing immediate cash flow relief.

51. With this type of policy Council could consider increasing the deductibles on its material damage policies, with the Parametric policy backing up Councils own reserve funds. They could also be used for a type of event, which only activates if they are above a threshold (for example, during a 1 in 1,000 year event), rather than a median risk level approach.

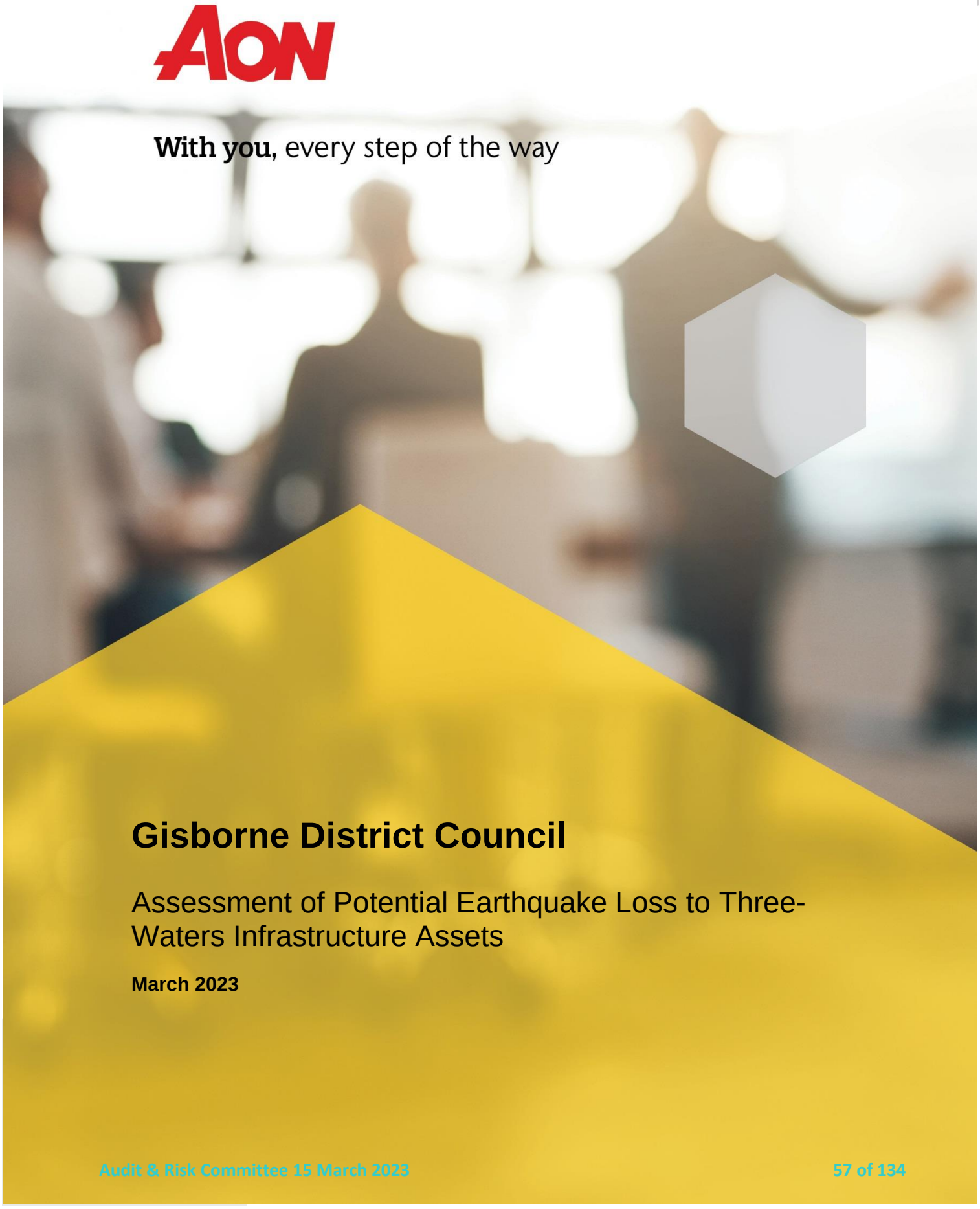
52. Exploration of a Parametric policy and other options will be explored in the coming months to see if they are viable options for Council.

NEXT STEPS - NGĀ MAHI E WHAI AKE

Date	Action/Milestone
March 2023	Amend loss limit for Infrastructure Cover, subject to finding market placement with underwriters
April 2023 onwards	Obtain pricing from our broker for a 500 and 1000 yr Earthquake loss limit.
April 2023 onwards	Action Key Insurance strategies (numbers 3-4 as scheduled for 2023 & 2024) Review insurance policies within the market (including the Parametric Policy) to see if they provide a better cost benefit to Council

ATTACHMENTS - NGĀ TĀPIRITANGA

1. Attachment 1 - Assessment of Potential Earthquake loss to Three waters Infrastructure Assets [**23-55.1** - 58 pages]
2. Attachment 2 - 2022 2023 Insurance Policy Descriptions [**23-55.2** - 4 pages]
3. Attachment 3 - 2022 2023 Asset insurance coverage or exclusion [**23-55.3** - 2 pages]
4. Attachment 4 - Insurance Strategies – Action Status and timelines [**23-55.4** - 1 page]



Gisborne District Council

Assessment of Potential Earthquake Loss to Three-Waters Infrastructure Assets

March 2023

Assessment of Potential Earthquake Loss to Three-Waters Infrastructure Assets

Prepared for:

Gisborne District Council

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Version	File Name	Produced By	Reviewed By	Date
Draft	GDC – Report – Council Loss Model Rev 1.0	Ellie Jude	Alec Wild	20th Jan 2023
Final	GDC – Report – Council Loss Model Rev 1.2	Ellie Jude		1st Mar 2023

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Executive Summary

Gisborne District Council (GDC) has engaged Aon's expertise to undertake an earthquake loss analysis for assets located in the Gisborne region.

The analysis delivers estimates of financial losses resulting from earthquake damage to three-waters infrastructure assets owned by Gisborne District Council. These loss estimates inform GDC and their insurers on how much risk to transfer through insurance, and how much to retain.

Two representative earthquake scenarios were assessed using the latest available modelling methodology and geotechnical expertise by Tonkin + Taylor. These scenarios have shaking levels approximately consistent with 500-year and 1,000-year average recurrence intervals (ARIs). Specifically, it is worth noting that the shaking from both scenarios is above the level required to induce liquefaction, resulting in significant losses in both cases.

GDC provided asset data for input into the loss analysis, with a total replacement cost of assets included in the modelling of approximately $586.3m. This value represents the expected reinstatement for all assets declared in the 2022-2023 insurance period, prolonging the validity of the loss estimates produced.

All three-waters assets declared on the infrastructure policy were included in the modelling, with the results presented separately in the pane to the right. Note that these predicted losses include demand surge (DS); a definition of demand surge can be found on page 12. Further breakdown of the loss estimates can be found in the body of this report.

Aon recommends a conservative approach when selecting insurance policy loss limits. The information provided in this report should not be used in isolation. Limitations to the analysis are outlined in the 'Limitations and Disclaimers' section.

Next steps to maximise the value of this work are discussed following the results section

Total Modelled Value

$586.3m

500 Year Median Predicted Loss
(inc. DS)

$292.8m

1000 Year Median Predicted Loss
(inc. DS)

$457.2m

Table of Contents

Introduction

GDC engaged Aon to undertake an earthquake loss analysis.

The analysis delivers estimates of financial losses resulting from earthquake damage to three-waters infrastructure assets owned by GDC. These loss estimates inform decisions on how much risk to transfer through insurance, and how much to retain.

The advanced analysis also sets the data foundation for future resilience work[1], such as prioritising assets by criticality to target network improvements that will have the most benefit for GDC and the community.

Two representative earthquake scenarios were assessed using the latest modelling methodology and geotechnical expertise available. These scenarios have shaking levels approximately consistent with 500-year and 1,000-year average recurrence intervals. The selection and development of the scenarios is explained in '*Earthquake Scenarios for Loss Estimate Analysis*', on page 9.

Aon Approach

Our approach is illustrated in the figure below.

Figure 1 – Risk Management Approach

Discover

An important first step is gathering the best practical understanding of the assets at risk. This means knowing where they are, what they are and how much they're worth. Ideally assets will have been valued for insurance purposes according to industry best-practice (insurance reinstatement). Use of depreciated financial values will result in less accurate loss estimates.

Once we understand the value at stake, we explore the ways in which this could be threatened. For the current work we have focused on earthquake shaking (and associated liquefaction) as the primary driver of damage. We explore the seismic hazard in the region and select two representative scenarios. Then we model the damage and quantify the expected financial loss for each scenario.

Develop

This work will help GDC decide how much risk they can retain, how much they should transfer, and what losses are sufficiently unlikely such that purchasing insurance is not considered necessary. This relationship is shown in the following figure.

[1] Note that the specific shaking scenarios selected in this report are for the purposes of loss estimation informed limit setting only – a uniform shaking scenario would be more suitable for understanding and improving network resilience. This ensures all assets are assessed with shaking of the same recurrence interval.

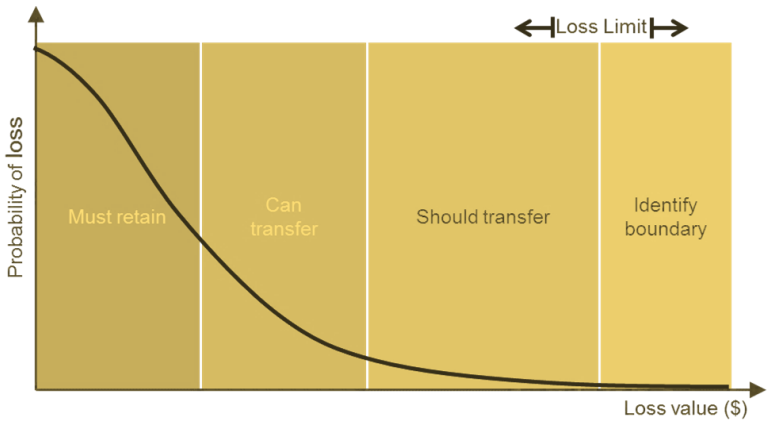

Figure 2 – Loss Curve and Loss Limit Setting

Deliver

Better information allows Aon to deliver optimal risk transfer outcomes when placing the portfolio risk into insurance markets. Councils that understand their exposures are also better placed to deliver:

- Strategic recovery planning.
- Enhanced community resilience.
- Cost-effective decisions around physical risk mitigation and financial risk transfer.

Review

Portfolios and markets are in a constant state of change. We recommend regular updates to loss estimates.

Report Structure

The remainder of this report is structured as follows:

- **Asset Data Sources** – Summary of the provided data, in terms of geography and completeness, with any necessary assumptions documented.
- **Geographic Extent** – Figures showing the geospatial distribution of the asset data.
- **Earthquake Hazard** – Discussion of the exposure of assets and the selected scenarios.
- **Loss Modelling Methodology** – Overview of the loss modelling process.
- **Results** – Presentation and discussion of loss estimates.
- **Next Steps** – Recommendations following this present work.

Asset Data Sources

This assessment covers the three-waters infrastructure assets owned by Gisborne District Council (GDC). The assets included were provided by the council in a geospatial database with supporting replacement value information as declared for the 2022-2023 renewal period. The reviewed infrastructure includes assets such as pipes, tanks, manholes and other reticulation assets.

The total value of three-waters infrastructure assets modelled for GDC are shown in Table 1.

Table 1 – Declared asset values for GDC

Service	Asset Type	Declared Value ($)	Proportion of Total Declared Value (%)	Proportion of Line Value Linked to GIS (%)
Stormwater	Levee	50,398,242	9%	-
	Channel	25,857,223	4%	-
	Pipes	27,332,646	5%	99.7%
	Other	24,813,699	4%	-
	Total	**128,401,811**	**22%**	**21.2%**
Wastewater	Pipes	170,929,743	29%	93.0%
	Manholes	22,403,449	4%	99.8%
	Facilities and Plant	529,590	0%	-
	Total	**193,862,782**	**33%**	**93.5%**
Water Supply	Pipes	190,567,788	33%	100.0%
	Facilities and Plant	69,524,433	12%	88.7%[2]
	Other	3,090,036	1%	97.0%
	Total	**263,182,257**	**45%**	**95.9%**
Other	Reserve Asset	828,252	0%	-
	All	**586,275,101**	100%	**79.7%**

An important factor in the accuracy of calculating GDC's loss expectancy is a good representation of the distribution of value across the network. This requires a linkage between the valuations data, and the geospatial data, often through a unique identifier. The proportion of the modelled value linked to the GIS is also shown in Table 1, with further commentary on the completeness of the available data overleaf.

[2] Based on original schedule provided, since then a number of linked reservoir line-items have been shifted from the policy.

Data Field Completeness

Due to the size and complexity of the datasets, it is rare that linkage between the schedule and the geospatial asset data is 100%: i.e., not all assets have a specified value or linkable unique identification number. Consequently, a portion of assets are not linkable to a representative point or line in the geospatial database.

- The total value of GDC assets modelled by Aon was $586.3m. Approximately 7% of the assets in the valuations document had a blank or zero-reinstatement cost.
- The valuations documents could be linked to assets in the geospatial data using the common field 'compkey'. There are no duplicate asset IDs in the valuation schedule with each line-item assigned a unique identifier. Based on the assigned ID, asset type, and expected geometry types for geospatial data, we have linked as many line items as practical.
- It should be noted that GDC have advised the geospatial data provided also contains a number of privately owned assets that are not declared in their internal database (IPS) - this accounts for a portion of the difference in number of line items between the GIS and the valuations.
- 88.0% of the asset IDs in the schedule were linkable, accounting for a total matched value of $489.5m. This consists of a $27.2m match for stormwater assets, $281.0m match for water supply, and $181.3m match for wastewater. Most of the linkable value is associated with underground pipe infrastructure (mains, service lines, laterals). Details of the proportion of value matched by asset type is shown in Table 1.
- Assets that were not linkable on the common ID field have had their value pro-rated into similar adjacent assets.

Geographic Extent

Figures 3 and 4 below show the extent of underground infrastructure assets owned by GDC.

Figure 3 – GIS Representation of Line Assets

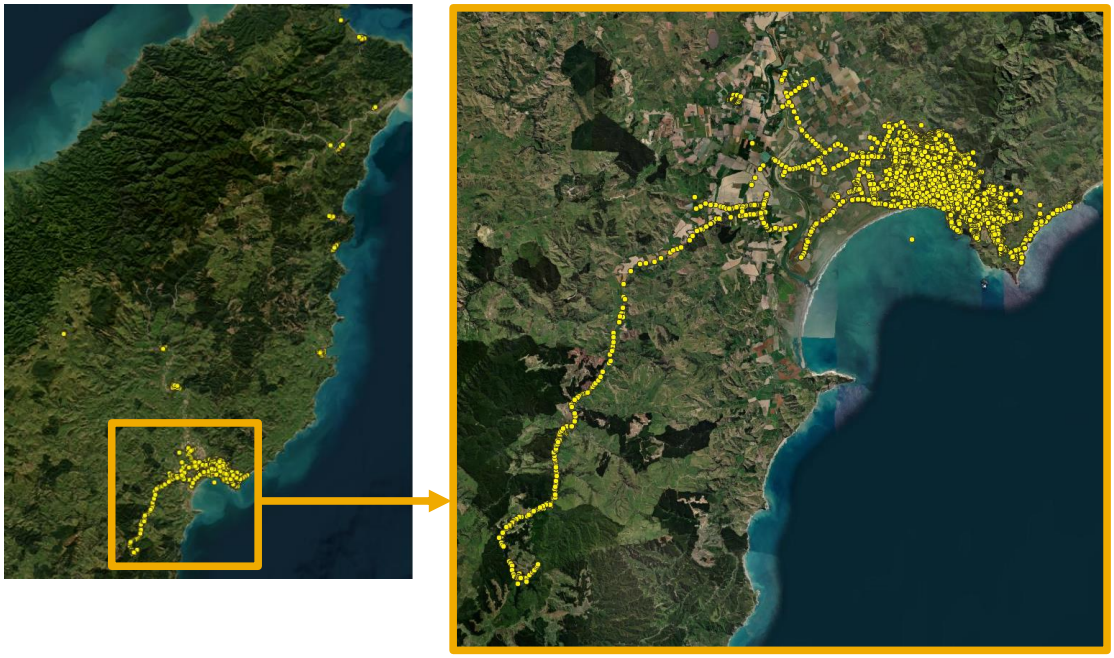

Figure 4 – GIS Representation of Point Assets

Earthquake Hazard

This section provides a summary of the earthquake hazard for GDC, including active faults, known historical events, information about ground conditions and representative scenarios selected for this analysis. More information can be found in Appendix B.

Active Faults

The Gisborne region is positioned on the Australian tectonic plate within close proximity to the Hikurangi margin (the area where the Pacific Plate subducts below the Australian Plate). This interaction between the Australian Plate and the Pacific Plate is known as a subduction interface. Much of the strain from this plate convergence is released on a series of faults known as the North Island Fault System, which strikes in a roughly northeast-southwest direction, predominantly to the east of the assets. Due to the proximity of the Gisborne region to the subduction zone, the tectonic regime is active, and the resultant seismic hazard is considered high.

Historic Earthquake Events

Since records began in the mid-1800s, there have been several earthquakes to impact the Gisborne region. The most intense earthquake in recorded history was the Te Araroa earthquake of 1995, with an estimated magnitude of approximately Mw 7.2. This earthquake epicentre was approximately 85km east of Te Araroa. The most recent event (2007) to impact the region came from a Mw 6.7 earthquake with an epicentre 50km south-east of Gisborne.

Ground Conditions

There are a range of different ground conditions in the GDC region. Stiffer rock and soil profiles often have less local ground amplification than softer profiles at low levels of shaking. At high levels of shaking this effect can be reversed, however, it depends on the structure and effect considered important to the structure (shaking amplitude, frequency content or duration).

When loose sandy or silty soils are subjected to strong earthquake shaking, there is a tendency for the soil particles to try to compact. If the soil is saturated with groundwater, such as around rivers and coastal regions, the water between the soil particles is unable to escape and becomes pressurised. If the shaking is strong and long enough, and the soil loose enough, soil particles lose contact with each other. At this point the soil behaves more like a fluid, and it temporarily loses much of its strength and stiffness. This phenomenon is called liquefaction.

Earthquake Scenarios for Loss Estimate Analysis

Based on the information summarised above and described in Appendix B, two scenarios were developed to produce shaking levels aligning approximately with 500 and 1,000-year ARI events in the region. This appendix was produced by Tonkin+Taylor, and the damage levels reported have informed the distributions of loss presented in this report.

As noted by T+T, there has been a recent update to the New Zealand National Seismic Hazard Model (NSHM22) released in late 2022. At this point, only high-level information has been released by GNS Science, showing a potential increase in the level of shaking for the Gisborne Region. However, insufficient information is available for Aon and T+T to assess the seismic hazard following the NSHM22 approach, in this present work. Updating the loss estimates based on this new model is suggested as an extension to this work once the technical information becomes available.

Loss Modelling Methodology

The following provides a high-level overview of the loss estimate methodology:

Data

GDC was asked to supply the asset data in GIS format file and associated insurance replacement values. After the data was provided by GDC, Aon linked asset values to the geospatial data and assigned modelling categories based on service, asset type, material, and location to each individual line item. Following this, GDC's data was provided to Tonkin+Taylor in the required format for damage modelling.

Scenario

Earthquake scenarios model the distribution and attenuation of shaking over a region. For this assessment, 500- and 1,000-year average recurrence interval (ARI) levels of shaking are targeted for the centre of the assets for GDC. These earthquake scenarios were selected by Tonkin+Taylor, with more information available in the detailed appendix.

Hazard

Liquefaction vulnerability is dependent on the soil profile, groundwater depth and shaking level and duration. This information has been used to adapt past studies to represent liquefaction vulnerability given the available information. This has informed the Liquefaction Severity Number (LSN) vulnerability parameter.

Damage

Damage for pipe assets was determined using break rate methodology. This methodology calculated the expected break rate distribution using shaking, liquefaction, and pipe type. For other asset types a damage stage was determined based on shaking and liquefaction using FEMA damage functions. The damage levels resultant from the chosen scenarios was modelled by Tonkin+Taylor and reported back to Aon in a spreadsheet format.

Loss

A critical component of determining the loss from the identified damage is the asset replacement strategy. Depending on the damage type/level, availability of resources and cost, the decision on whether to repair or replace the asset has been made. This decision is based on the level of damage, presence of liquefiable material, where pipes are gravity fed or pressurised and the economic efficiency of repair vs replacement. The conversion of the damage into potential loss incurred by GDC has been completed by Aon.

Uncertainty in Loss Estimation

Earthquakes by the nature of the event and the frequency in which they occur create situations where there is large uncertainty in the damage and losses being estimated. For this reason, a factor of approximately between 0.85 and 1.4 has been included into the stochastic model. This uncertainty increases as the average recurrence interval (ARI) increases. This is due to unfamiliarity with such sized events.

Every loss estimate produced is influenced by uncertainty. Two different loss estimates produced for the same ARI will indicate different loss levels due to uncertainty but will still be within the overall range of possible damage for a set event.

There are two high-level categories of uncertainty:

- Natural variability represents variables that are random and unpredictable by nature, these differ event to event or place to place.
- Knowledge uncertainty represents variables that are more or less constant, but we don't know their values

Specific uncertainties in the modelling include (but are not limited to):

- Earthquake magnitudes, return periods, depths, and locations.
- Ground motion resulting from earthquakes.
- Ground response in terms of liquefaction and lateral spread.
- Damage to assets considering installation quality, condition etc.
- Cost to repair assets considering traffic management, availability of resources and key staff, price of replacement parts, access to assets, repair vs replacement, damage inspection costs, temporary repairs, or equipment etc.

Additionally, we learn more after each natural disaster event and this represents further uncertainty in the loss estimation process that we currently use. This uncertainty is likely to increase the loss.

Comment on Assets

The scenarios developed target the centre of populated centre and assets. This assumes that the population centres are going to consist of the majority of assets. However, it is possible that, an individual asset (or cluster of assets around a population centre) could experience higher hazard intensities in the 500-year than in the 1,000-year shaking; this leads to higher estimated levels of damage for the specific asset.

Furthermore, the assets modelled within this study are exclusively those declared on the infrastructure schedule, for the purpose of informing GDC and their broker on a suitable range for loss limit setting. From an asset management perspective, it is important for GDC to consider the potential financial implications of damage to other assets, such as treatment plants and pump stations (usually declared on an above-ground material damage policy). These assets are generally high-value assets and can therefore have a significant cost associated with any damage.

Determining an Insurance Loss Limit

Loss modelling provides loss estimates that are a representation of what is the likely consequence (loss or damage) from a given event. The variability of the outcomes, and inherent uncertainty, is considered as part of the statistical analysis. However, there are always unknown factors and complexities that can impact actual loss outcomes compared to a theoretical representation.

It is therefore important that loss estimates are not converted immediately into a loss limit, but instead are used as part of the process to determine policy loss limits.

Demand surge has been represented in the loss estimates. A more detailed definition for demand surge is provided below.

Demand Surge

Demand surge is an economic phenomenon where the cost to repair damage to buildings and other infrastructure assets in large natural disasters is significantly greater than the cost to repair the same damage in a smaller disaster (or during typical asset renewals). The key factors that contribute to demand surge are (but are not limited too):

1. Magnitude of damage and size of the affected area (i.e., a significant event such as the rupture of the Hikurangi Trench would have a significant impact on the majority of NZ).
2. Growth stage of the local and natural economy – variation over time and geography.
3. The size of the construction sector – variation over time geography.
4. Industry wage levels.
5. Resource availability – labour and resources.
6. Global considerations such as supply chain disruption and increased costs caused by the current pandemic and war/conflict.

The high-impact low-probability scenarios modelled on the Hikurangi fault, create significant damage, both in terms of severity and spread. This coupled with potential labour and resource limitations, due to transportation and availability, is expected to push demand surge towards the upper end of the scale. The demand surge modifier can be a damage amplifier of between 1 and 1.7 times depending on the above factors.

Aon brokers can advise on the practicalities of implementing demand surge into the insurance placement.

Results

Damage from an earthquake might be caused by several different factors. Most of the damage is expected to be caused by the effects of shaking and land deformation (especially liquefaction, lateral spread, differential settlement, and surface fault rupture).

The following tables provides a summary of loss estimates for GDC, **including demand surge (DS)**. Note that given demand surge inflates the insured asset losses, it is possible for the expected cost to exceed the declared value in the case where significant damage is predicted.

Table 2 – Estimated Losses GDC

Scenario	Utility	Assets Type	Modelled Value ($M)	Cost Estimate inc. DS ($m)		
				10th Percentile	Median	90th Percentile
500 - year ARI	Water Supply	Pipes*	193.7	39.6	67.9	113.4
		Other Reticulation	69.5	28.1	41.7	59.7
	Wastewater	Pipes*	193.3	91.3	109.4	147.1
		Other Reticulation	1.4	0.9	1.4	2.0
	Storm Water	Pipes*	128.4	58.7	70.8	96.6
		Other Reticulation	-	-	-	-
	All	**Total**	**586.3**	**234.9**	**292.8**	**401.2**
1,000 - year ARI	Water Supply	Pipes*	193.7	87.2	123.9	181.7
		Other Reticulation	69.5	70.0	85.6	111.6
	Wastewater	Pipes*	193.3	120.9	144.0	189.9
		Other Reticulation	1.4	1.1	1.7	2.3
	Storm Water	Pipes*	128.4	83.7	100.0	132.6
		Other Reticulation	-	-	-	-
	All	**Total**	**586.3**	**375.6**	**457.2**	**603.2**

*__Pipes and associated point assets__ including but not limited to valves, nodes, inspection points etc, which in the event of significant damage to the pipe network, would be reinstated based on the damage level and replacement strategy of the collocated pipe, rather than as individual assets.

Note:

There are a large number of assets in the ground that are not declared on the schedule, therefore the damage contribution from these assets is not considered (for this exercise, they have no value). This is likely to skew the results towards insured assets (regions with well-populated data, newer areas of the network, or critical assets), and may not reflect the contribution of losses from areas with a high density of uninsured assets, and high exposure to damage.

These results should therefore be viewed as the distribution of losses from insured assets, and not the sum of all potential losses GDC may see in this event.

Next Steps

Following the loss modelling work, Aon recommends that GDC:

- **Strategy Alignment**: Consider aligning insurance, infrastructure, and disaster response and recovery strategies. This will allow them to relate and respond to the identified vulnerabilities from natural hazards, and how these vulnerabilities affect Council's infrastructure service priorities (inclusive of the availability of three-waters infrastructure assets services following natural hazards). Better alignment can better inform the clients' strategy on upgrading of the reticulation network, guiding the maintenance and upgrade schedule for plant assets, and assisting with other natural hazard risk mitigation measures.
- **Data Completeness:** There are some data fields which would benefit from review, for example, misalignment between the service, asset type and asset description (i.e., wastewater service assets labelled as storm or water supply mains). Further detail added to the asset description field, such as the type of plant/equipment, could give a clearer picture of the on-ground assets and allow for more specific damage curves to be applied in future modelling work.
- **Dataset Alignment:** It is worth noting that GDC have a large number of assets in their geospatial data that are not declared on the schedule, either due to age, condition, or redundancy. It should be noted that GDC have advised the geospatial data also contains a number of privately owned assets that are not declared in their internal database (IPS) - this accounts for a portion of the difference in number of line items. Compared with the valuations 36,485-line items, there are 76,095 geospatial line items - it is not uncommon for small point items (valves, nodes) to be valued within the 'pipe' value. There could be benefit in conducting a Quality Assurance (QA) exercise on the two datasets to give clarity around the assets and areas insured and adding either a field of 'insured' vs 'self-insured' or a parent ID for aggregate valuations would benefit future uses of the data.
- **Full Network Modelling**: To understand the sum of all potential losses from an event that could impact GDC's balance sheet, there would potentially be benefit in assigning suitable values to all uninsured assets (either through a formal valuation, or representative values through a desktop exercise, as appropriate). This would be followed by a repeat of the modelling considering the contribution of damage across the full network, independent of insurance status. Additional policies or asset types could be included (i.e., above ground facility assets) as required. This second stage of work would give insight into the potential insured, retained and recoverable losses, and could give GDC a 'big picture' view of a real-world earthquake event.
  - With the upcoming national change of ownership of many three-waters assets in New Zealand, it would potentially benefit GDC to understand which assets will remain on their insurance schedules (i.e., flood protection assets and above ground structures such as the building portfolio) and understand how this change in risk profile alters the overall risk transfer strategy.

Aon and Tonkin + Taylor are interested in assisting GDC further with the extension of the analysis. This would be an additional stage of work, beyond that currently undertaken and would require further engagement with GDC. Such work, if undertaken, will also bring cost benefits, i.e., risk mitigation by network hardening may reduce the loss estimate from a natural hazard – reducing the cost or requirement for risk transfer.

References

The following is a non-exhaustive list of all the sources of information used in this report:

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- Olsen, A.H. (2012) Demand Surge Following Earthquakes, United States Geological Survey, Golden, Colorado. 15 WCEE LISBOA 2012

Note: Additional references are provided in Tonkin + Taylor Report provided in Appendix B

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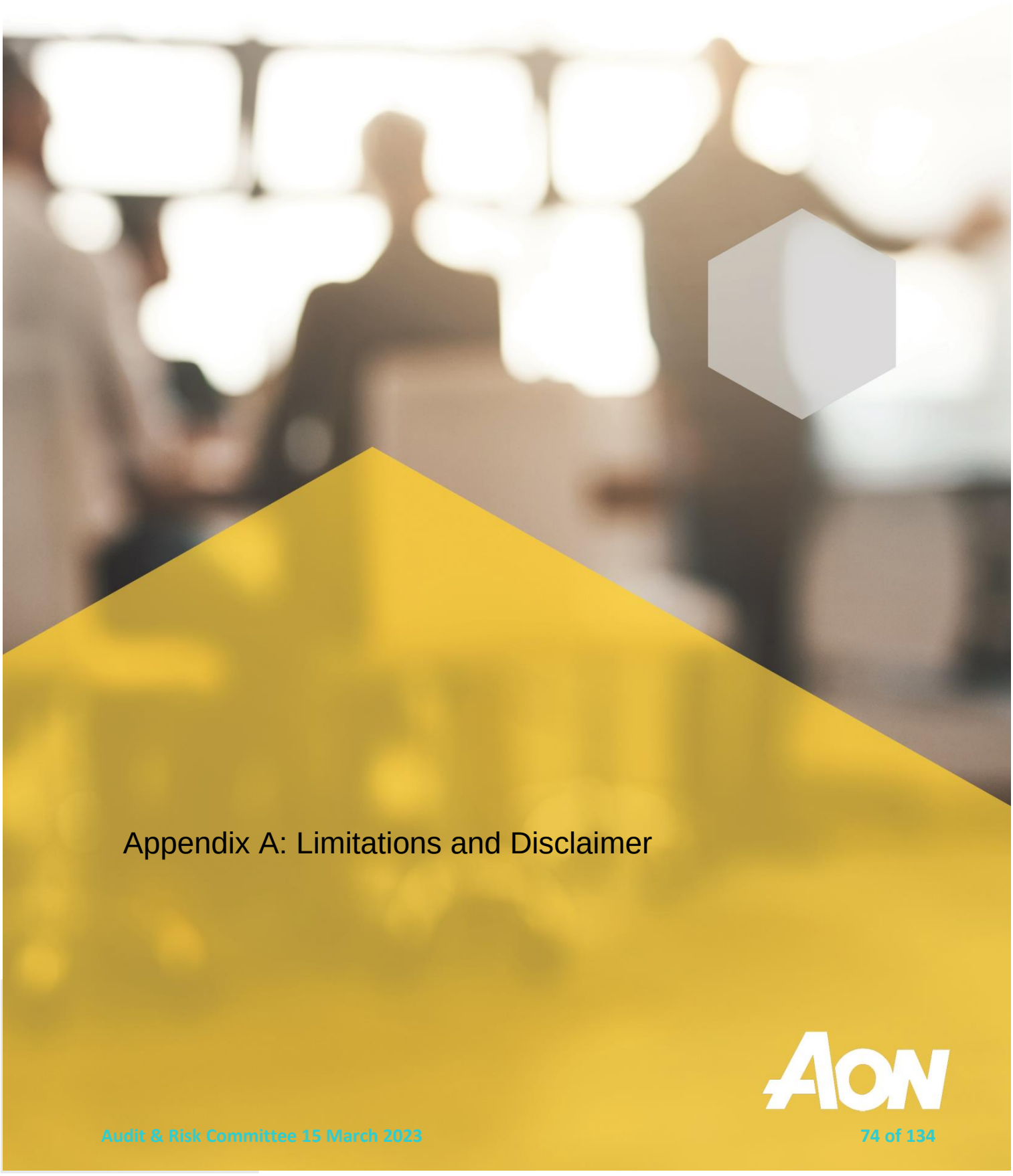


Appendix A: Limitations and Disclaimer

Limitations and Disclaimer

The primary aim of the analysis contained in this report, prepared by Aon and Tonkin + Taylor (we, our) has been to ascertain and determine loss estimates for earthquake events for Gisborne District Council (the Client). The loss estimates provided are considered pragmatic and at an appropriate level and in line with good practice for loss estimations associated with severe earthquake events.

This analysis has considered a limited number of earthquake scenarios and as natural hazard events are intrinsically unpredictable, there is a margin of uncertainty attaching to the results. The results and findings in this report have been reached through a series of qualitative assessments in combination with various assumptions and limitations. Please note the following in particular:

- Any form of mathematical and/or empirical analysis and modelling (including that used in the preparation of this document) may produce results which differ from actual events or losses.
- Information for all assets modelled has been gained from the schedule of assets provided by the council at the level of detail supplied.
- The review and calculation of loss estimates was desktop-based, and its accuracy is reliant on the information supplied by the Client and/or selected third party sources. We accept no responsibility for the accuracy or completeness of the underlying information provided.
- Damage estimates are based on replacement estimates provided by Council. Aon and T+T reserve the right but not the obligation to recalculate damage estimates if the information is found to be in error or not suitable for full replacement of the assets in the event of a loss.
- Unless specified in the original report scope, no site-specific assessment of slope stability, or landslide implications that may be associated with earthquake shaking has been undertaken as part of this assessment.
- We recommend that asset valuations are reviewed on a regular basis and are estimated using an insurance-based reinstatement cost, not financial (or depreciation) based valuations (which may not consider all the various factors associated with a large loss).
- Aon recommends that the results presented in this report should not be relied upon in isolation when making decisions regarding policy limits.

Notes to Loss Estimates

i. Damage estimates have been calculated as a continuous probability distribution and three values are reported from this to give an understanding of the potential variability of the results for any given scenario. These values are based on the thousands of individual damage simulations for each of the selected scenarios.
    i. The 10th percentile represents the value for which 90% of the individual damage simulations might be expected to exceed the $ loss given. It represents a low estimate for the loss potential within the simulation.
    ii. The 90th percentile represents the value for which 10% of the individual damage simulations might be expected to exceed the $ loss given. It represents a high estimate for the loss potential within the simulation.
    iii. The median/50th percentile represents the value for which 50% of the individual damage simulations might be expected to exceed the $ loss given.
    iv. Given the inclusion of probability in the 10th, 50th and 90th percentile values the totals are not simply an addition of the numbers.
    v. Note that the damage estimates and values provide include modelled conservatism.
ii. No assessment of surface fault rupture and tectonic subsidence has been undertaken as part of this assessment.

iii. No assessment of ground deformations or ground displacement that may be associated with earthquake shaking has been undertaken as part of this assessment.

iv. No estimation of the magnitude of settlement associated with liquefaction and its consequences has been undertaken as part of this assessment.

v. No estimation of damage caused from lateral spread has been undertaken as part of this assessment. However, an allowance has been made in the financial model to attempt to include this. Where a pipe is in an area of lateral spread and are damaged, it is assumed to have damage from lateral spread requiring repair. Where a above ground asset is in a lateral spread zone the damage increases by one damage state.

vi. No estimation of damage caused from landslide inundation has been undertaken as part of this assessment.

vii. No allowance has been made for enablement costs in the assessment. This should form part of an additional assessment.

viii. Liquefaction effects multiply damage (at increasing levels) from MM6 shaking intensity for areas with very high liquefaction vulnerability and from higher shaking intensities (MM7 to 9) for areas of lesser liquefaction vulnerability (high to low).

ix. If a pipe is damaged in a liquefiable zone, it is assumed that liquefied material fills the pipe (wastewater and storm water only) causing additional damage / need for replacement.

x. Damage ratios based on published curves (Cousins 2013, Bouziou & O'Rourke 2017, and FEMA 2013(HAZUS)) for similar asset types. Indicative material damage loss levels only.

xi. Consideration of the increase of costs after a large-scale disaster, or demand surge, has been made in the damage estimates. The ranges between a factor of 1 and 1.7.

xii. Additional detailed assessment (i.e., ground condition checks) is recommended to establish more accurate loss levels.

xiii. The estimate does not provide for additional damage that could be sustained during large secondary or after-shocks, nor does it factor for a second major earthquake in the region during the same insurance period.

xiv. For larger point assets, average response conditions have been assumed. Specific localised ground effects or the directional forces of the earthquake may cause specific conditions that exacerbate damage. Initial Evaluation Procedure reports (building assessment compared to current building code) for the majority of buildings has been provided by council. However, these assessments are arbitrary plus the building standard is meant to protect lives not the building itself. The IEP values provide an indication of potential loss. However, without in-depth structural and geotechnical investigation the actual loss potential cannot be accurately pre-determined. When determining loss limits for insurance purposes, the potential for additional damage to high value point assets, within the portfolio of assets considered, can be improved by undertaking more specific and detailed assessment for that asset.

xv. The modelled losses presented in this report should be interpreted as follows. The "1,000-year ARI" loss means that there is approximately a 1 in 1000 annual probability that a loss of this size will be exceeded in any given year.

xvi. Catastrophe (cat) models assume high correlation between characteristics of insured infrastructural and point assets and those of the model features (such as vulnerabilities) designed to represent them. Specific individual risks however may have very different attributes to those assumed by the cat models. This means that real-life losses from a single risk or small group of risks concentrated at one or more locations could potentially exceed infrastructure-network/ point assets modelled losses calculated using the natural hazard models.

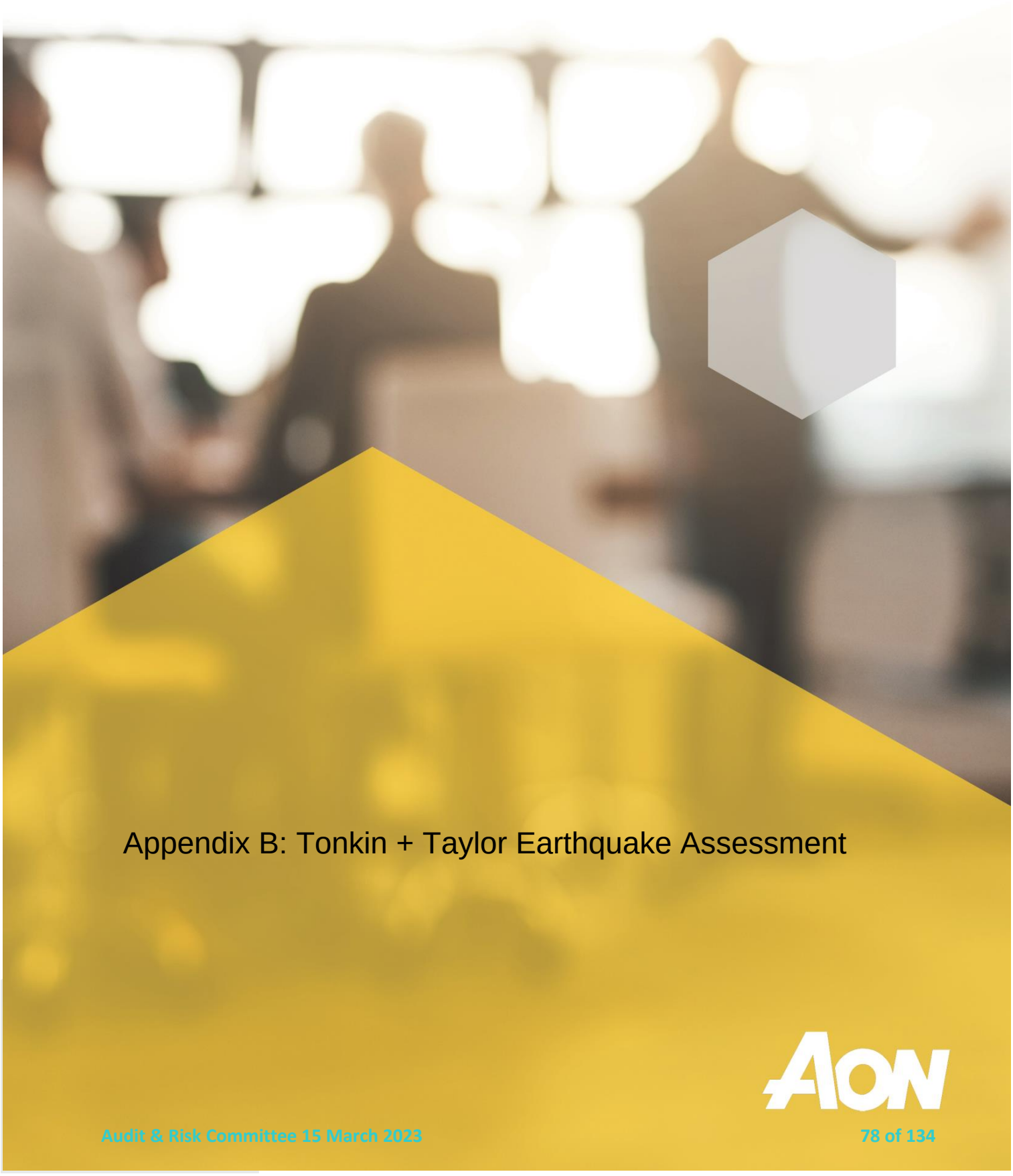
xvii. Modifiers have been added to the reinstatement values to provide some allowance for the averaging that takes place in the valuation process and unexpected costs that are likely to arise.

Declaration

The Client acknowledges the assumptions and limitations noted above and agrees:

- Where this report includes a recommendation or an assessment of risk, this is an expression of our opinion only and not a statement of fact. Any decision to rely upon any such recommendation or assessment will be solely at the risk of the Client, for which we accept no liability, and the Client acknowledges that the analysis provided does not replace the need for the Client to make its own assessment.
- We will not be liable, in any event, for any special, indirect, or consequential loss or damage of any kind (including but not limited to, loss of profit and business interruption, loss of use, loss of revenue, loss of contracts, increased costs and expenses, wasted expenditure, and all special, indirect, and consequential loss or damage suffered by the other party) arising from any use of the information contained in this report.
- We reserve all rights to the content of this report. No part of this document may be reproduced or transmitted in any form or by any means, whether electronic or mechanical, including photocopying, recording or otherwise, without our prior written consent. This document is provided exclusively for the use of the Client.

No part of this document may be made available to any third party without both (i) Aon and Tonkin + Taylor's prior written consent and (ii) that third party having first signed a "recipient of report" letter in a form acceptable to us. No responsibility is accepted to any third party for the whole or any part of the content of this document and all liability howsoever arising to any third party is hereby expressly excluded



Appendix B: Tonkin + Taylor Earthquake Assessment

Tonkin+Taylor

Gisborne District Council

Probable maximum loss estimate for three waters infrastructure

Prepared for
Aon New Zealand
Prepared by
Tonkin & Taylor Ltd
Date
January 2023
Job Number
29730.1014 v1.0

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Document control

Title: Gisborne District Council					
Date	Version	Description	Prepared by:	Reviewed by:	Authorised by:
12/01/2023	1.0	Final for client issue	Daniel le Roux	James Russell	Mike Jacka

Distribution:

Aon New Zealand	1 electronic copy
Tonkin & Taylor Ltd (FILE)	1 electronic copy

Table of contents

1 Introduction

Aon New Zealand (Aon) is conducting an assessment for Gisborne District Council (GDC) to estimate the financial loss to three waters infrastructure from future earthquakes and associated secondary hazards (e.g. liquefaction). We understand that the purpose of Aon's assessment is to evaluate the financial losses from seismic hazard to inform financial risk transfer strategies. As part of this assessment Tonkin & Taylor Ltd (T+T) was engaged by Aon to carry out an earthquake hazard and damage assessment for three waters infrastructure.

1.1 Scope of work

The scope of work covered in this report comprises undertaking an earthquake hazard and damage assessment for three waters assets collectively owned by GDC.

The following is a breakdown of the main tasks to achieve this:

1 Review and collate the three waters infrastructure information in GIS format for the purpose of this loss estimation process.

2 Conduct a high-level seismic hazard review to inform earthquake scenario selection and use this to develop earthquake scenarios to target 1 in 500 year and 1 in 1,000 year shaking intensities for the region.

3 Develop a liquefaction hazard layer for the asset areas using the available base information including geotechnical ground investigations, groundwater information, geomorphology maps of the region, LiDAR and other relevant information.

4 Estimate damage as a damage ratio for each asset type from seismic shaking and liquefaction for both of the earthquake scenarios.

5 Provide Aon with a spreadsheet linking assets with associated data related to damage ratios.

1.2 Assessment area

The Gisborne district is situated in the eastern North Island of New Zealand. Gisborne city is situated on the coast in the Poverty Bay Flats area, at the convergence of the Waimata, Taruheru and Turanganui rivers. The boundary of the Gisborne district, defined spatially in the Stats NZ Territorial Authority 2022 dataset[1], represents the study area for this project. The land area is shown in Figure 1.1.

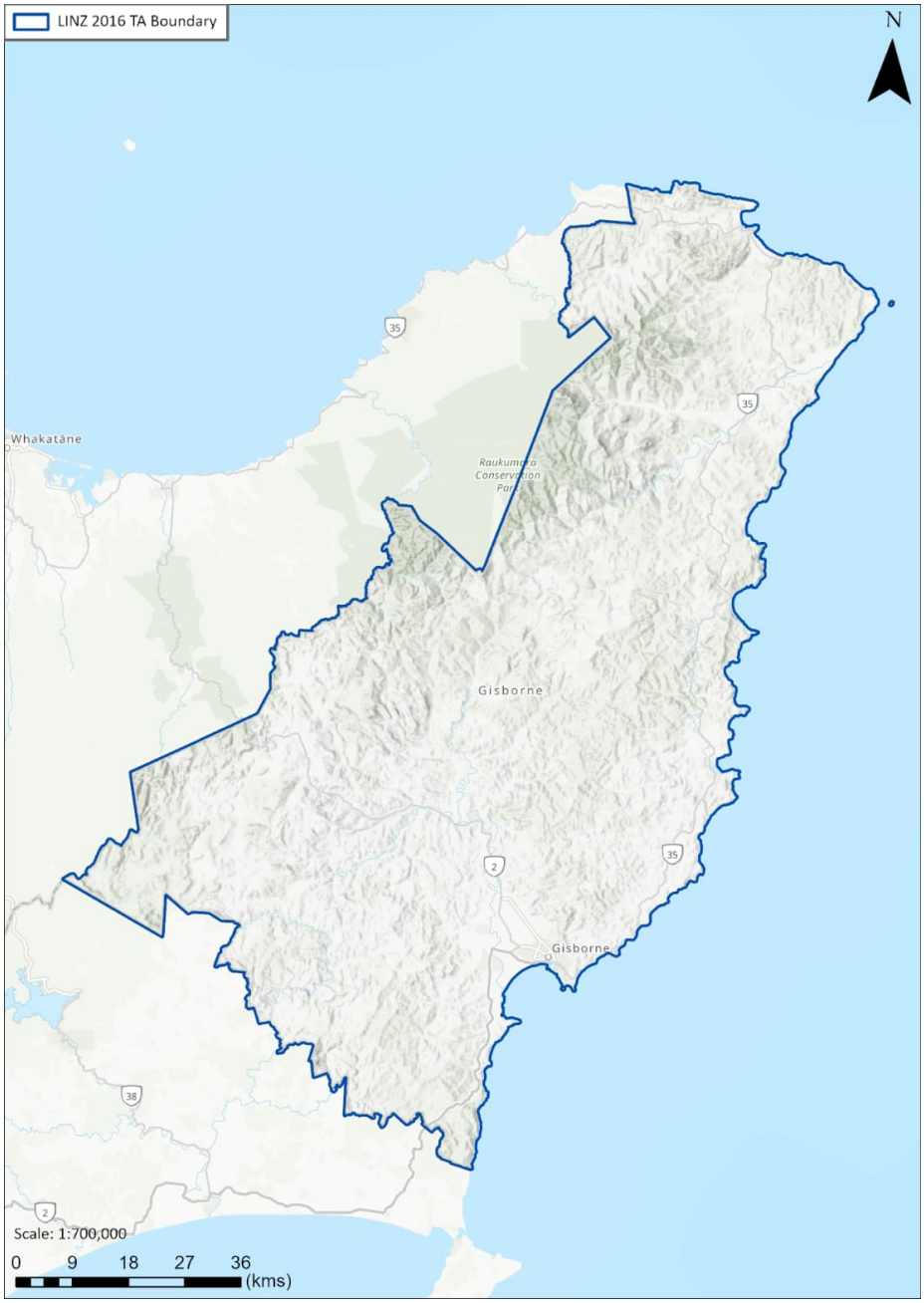

Figure 1.1: Gisborne region representing study area

[1] Territorial Authority 2022 (generalised) - GIS | | GIS Map Data Datafinder Geospatial Statistics | Stats NZ Geographic Data Service

1.3 NSHM update

In October 2022, GNS Science released the revised National Seismic Hazard Model (NSHM). This represents the latest scientific knowledge of earthquake hazard in New Zealand and is an important factor for understanding and managing earthquake risk in the built environment.

While high-level results from the 2022 NSHM are available in a public web portal, the underlying models (including any updates to the fault rupture parameters relevant to Gisborne) were not publicly available at the time of this assessment. For this reason, rupture parameters from the 2012 NSHM and design shaking levels from Module 1 (MBIE & NZGS, 2021) have been used.

While it would be preferable to use the most up to date NSHM (if it were available), because the modelled ground motion is based on the Module 1 shaking levels (which used seismic hazard models similar to the 2022 NSHM), the effect of these changes are relatively minor. Therefore, the impact on the results of this assessment are also expected to be relatively minor, particularly when considered within the context of the uncertainties inherent in the overall damage model process.

2 Background

This section provides background information about earthquake hazard and damage to three waters infrastructure. It includes information about the regional seismic hazard in the area and the seismic damage mechanisms considered for this assessment.

2.1 Regional seismic hazard

This subsection provides seismic hazard information about the Gisborne region, including:

- The location of known active faults.
- A description of known historical events.
- A summary of information about shaking intensity recurrence.

2.1.1 Active faults

The Study Area is positioned on the Australian tectonic plate within close proximity to the Hikurangi margin (the area where the Pacific Plate subducts below the Australian Plate). This interaction between the Australian Plate and the Pacific Plate is known as a subduction zone. Due to the proximity of the Study Area to the subduction zone, the tectonic regime is active and the resultant seismic hazard high.

Seismicity in New Zealand is estimated using the National Seismic Hazard Model (NSHM) published by Stirling et al. (2012). This outlines the known faults and their characteristics of magnitude and average recurrence of rupture. Across New Zealand, the tectonic setting and the seismicity varies. Figure 2.1which was taken from the NSHM for New Zealand (Stirling, et al., 2012), illustrates the known active faults proximal to and within the study area.

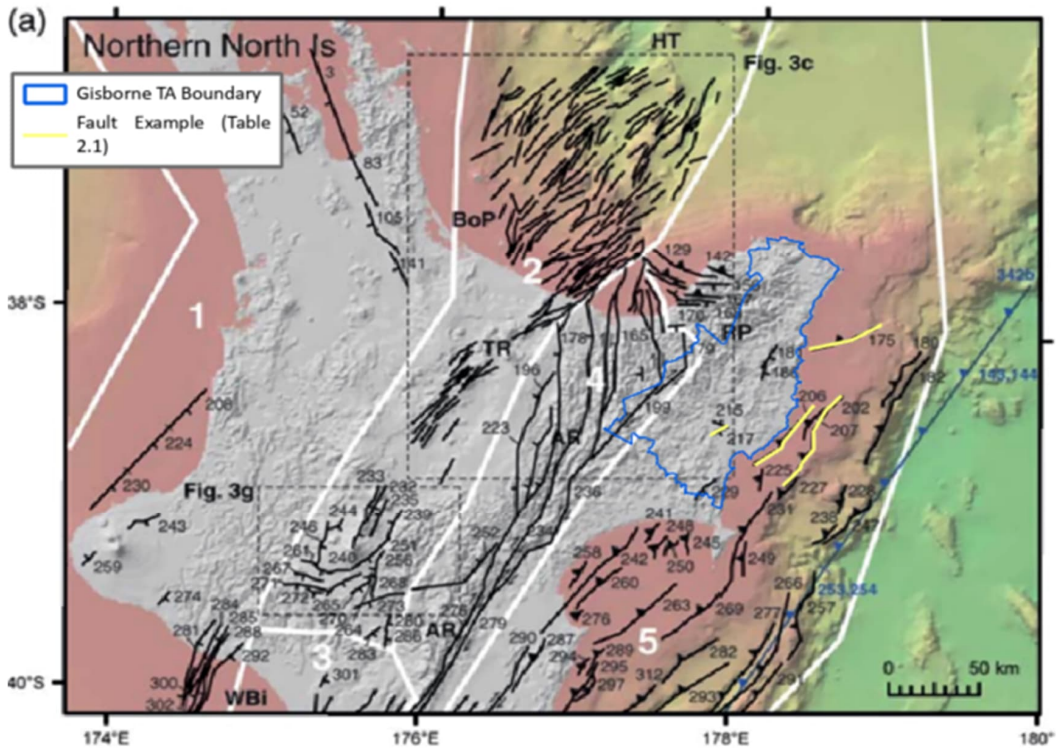

Figure 2.1: Known active faults in the Gisborne Region

The characteristics of five of the larger faults within, and offshore of, the Study Area are summarised in Table 2.1 (noting that other faults outside the study area could also cause strong shaking within it).

Table 2.1: Examples of the larger known active faults in the Study Area

Fault name	Fault number	M_w	Fault type	Recurrence interval*
Repongaere	217	6.1	Active Shallow Crust	<2000 years (Class I)
Houtunui	175	7.2	Active Shallow Crust	<2000 years (Class I)
Gable End	206	7.2	Active Shallow Crust	<2000 years (Class I)
Hikurangi Subduction Zone	328	8.1 – 8.4	Interface	<2000 years (Class I)
Ariel Bank	207	7.4	Active Shallow Crust	<2000 years (Class I)

*Based on MfE and GNS Planning for Development of Land on or Close to Active Faults Report (Kerr, et al., 2003)

Further to the known active faults, unknown faulting and other seismogenic (earthquake generating) sources are likely within the region. Surface expressions of past fault ruptures can be hidden by younger soil deposits. Earthquakes could be expected to occur at any location and are not limited to known faults. This was illustrated by the Canterbury Earthquake Sequence, which occurred predominantly on unknown faults. Unknown faults are likely to exist, and some consideration is applied in Stirling et al. (2012) as a distributed source model in combination with the fault source model.

2.1.2 Historic earthquake events

Historical observation records of large earthquakes in New Zealand exist back to approximately 1840. Table 2.4: lists a sample of significant past earthquake events in the Gisborne district.

Table 2.2: Historic earthquake events in Gisborne District

Earthquake event	Year	Epicentre estimate	Magnitude estimate (M)	Modified Mercalli shaking intensity in Gisborne
Gisborne, 26 March	1947	65 km south-east of Tolaga Bay	7.0	Severe
Gisborne, 20 December	2007	50 km south-east of Gisborne	6.7	Severe
Te Araroa, 6 February	1995	85 km east of Te Araroa	7.2	Strong

2.1.3 Shaking intensity recurrence

The frequency or recurrence of earthquake shaking at a location is a function of the hazard from all faults and background (distributed) seismic sources, in and surrounding the area of interest. Module 1 of the NZGS Guidelines (MBIE & NZGS, 2021) provides estimated Peak Ground Acceleration (PGA) and Magnitude (M) values for Geotechnical Assessment throughout New Zealand for given return periods. Table 2.3 provides the 500 and 1000 year return period values for the Gisborne region.

Table 2.3: Shaking intensity Average Recurrence Interval (ARI) PGA and M estimates for the Gisborne region (MBIE & NZGS, 2021)

Return Period (years)	PGA (g)	M
500	0.65	7.5
1000	0.87	7.5

2.2 Seismic damage mechanisms

Three waters network elements are typically founded in or on the ground, therefore seismic damage to these elements typically occurs as a result of ground deformation. Ground deformation can be characterised as either transient or permanent (Table 2.4; O'Rourke, 1998). Transient deformation occurs during earthquake shaking and is the direct result of passing seismic waves, but the ground typically returns to its original state after the earthquake. Permanent ground deformations occur when the ground shaking leaves the ground in an altered state after the earthquake or if secondary effects, such as liquefaction, are triggered which can lead to deformations after the shaking has ceased.

Table 2.4: Seismic damage mechanisms grouped by type of ground deformation

Transient ground deformation	Permanent ground deformation
Earthquake shaking	Liquefaction and lateral spread Surface fault rupture Tectonic subsidence and uplift

Aspects of the ground conditions have been broadly characterised as part of previous studies for the Study Area. This report focuses on the earthquake shaking and liquefaction vulnerability (including lateral spreading), which can cause significant damage to pipe networks and point assets. Sections 2.2.1 and 2.2.2 provide additional information about each of these seismic damage mechanisms.

Surface rupture of faults and tectonic subsidence/uplift are earthquake-related hazards that have the potential to damage to infrastructure. They can occur concurrently with other earthquake-related hazards and both damage mechanisms are plausible in the Gisborne district. In particular, tectonic subsidence/uplift can be large scale and can cause significant damage to three waters infrastructure (gravity systems are especially vulnerable).

However, it is extremely difficult to predict and model the precise location and severity of both of these forms of permanent ground deformation. The assumptions made can have a significant impact on the loss estimates derived. For example, assuming surface fault rupture directly impacts a large number of high value assets could significantly increase the resulting damage estimates, whereas this damage might not occur in another similarly plausible earthquake scenario. Therefore surface fault rupture and tectonic subsidence/uplift have been excluded from the scope of this report.

2.2.1 Earthquake shaking

Earthquake shaking causes transient ground deformation, which can be damaging for both buried and on-ground infrastructure, but usually by an order of magnitude less than damage in areas where there is permanent ground displacement (O'Rourke et al., 2014). As seismic waves travel through the ground, two points located along the propagation path will experience out-of-phase motions (Opus, 2016). Those motions induce both axial and bending strains in buried infrastructure due to the forces and deformation at the pipe-soil interface. The typical pipe failure mechanism is local buckling (wrinkling of the pipe wall), which can lead to cracks in the pipe wall and leaks (O'Rourke & Liu, 1999). Other pipe failure mechanisms include tensile failures, welded joint failures and joint failures on segmented pipes.

When developing an estimate of the likely intensity of earthquake shaking at a particular site the key considerations are the fault characteristics, fault rupture length, the distance from the fault and the subsurface ground conditions.

The subsurface ground conditions are considered for the amplification effect the ground profile can have on the seismic waves as they travel up towards the ground surface. Often the highest degree of amplification occurs for the softest sites, and this amplification is most significant at low levels of shaking, with the effect becoming less at higher intensities of shaking (Cousins, 2013). At high levels of shaking this effect can be reversed, however the process is complex as it depends on the structure being affected and the component of that shaking that is considered important to the structure (shaking amplitude, frequency content or duration).

Vs30 is the shear-wave velocity over the top 30 metres of the subsurface and is an input in the ground motion prediction equations applied to model ground conditions for seismic amplification and attenuation in this study. Foster et al (2019) developed a New Zealand Shear-Wave Velocity (Vs30) model. The New Zealand Vs30 model is applied in this assessment as an input when developing the earthquake shaking hazard model.

2.2.2 Liquefaction

For some types of soil, strong earthquake shaking can cause rearrangement of the soil particles. If the soil is saturated then this rearrangement can increase the pressure of the water between the particles, up to the point of liquefaction where the soil temporarily loses much of its strength and stiffness and behaves more like a fluid

Liquefaction can cause damage to the ground - such as ground settlement, cracking, and ejection of liquefied soil to the surface. It can also cause damage to buildings and infrastructure - such as foundation settlement and stretching, and damage to underground services.

Whether liquefaction occurs, and its consequences, depends on various factors which are examined in the following sections. Key factors include the intensity and duration of ground shaking, soil type and density, the depth to the groundwater table, and the location of liquefied soils relative to the ground surface and foundation elements. Figure 2.2 shows a schematic diagram of the liquefaction process, ground densification and the formation of liquefaction ejecta.

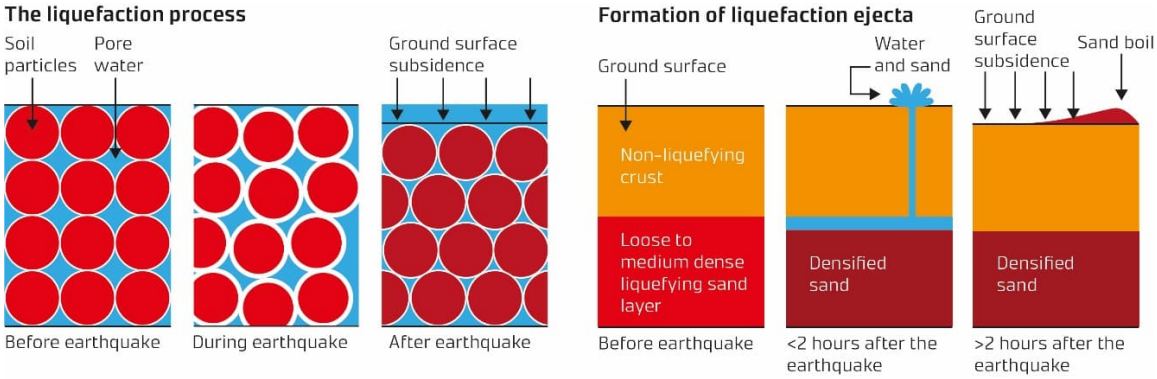

Figure 2.2: Schematic representation of the process of liquefaction and the manifestation of liquefaction ejecta.

In areas with soils that are susceptible to liquefaction, significant damage to structures can be caused by liquefaction-related lateral spreading in addition to the ground subsidence described above. Lateral spreading occurs in areas with gentle slopes or areas with nearly level ground with a free-face in close proximity (such as a road cutting, old river terrace or river bank). Figure 2.3 is a schematic representation of liquefaction-related lateral spreading.

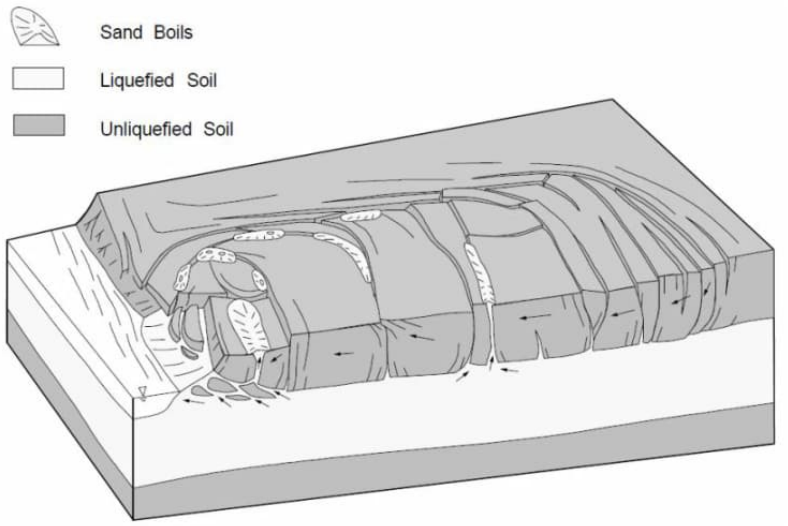

Figure 2.3: Schematic of liquefaction related lateral spreading (Deterling (2015), originally from Varnes 1978)

Liquefaction and associated lateral spreading can cause significant damage to three waters elements. While the immediate effects of liquefaction relate primarily to land, building and infrastructure damage, liquefaction can also have a significant social, economic and environmental impact, refer to Section 2.4 of Planning and engineering guidance for potentially liquefaction-prone land (MBIE, 2017). A summary of the main potential consequences of liquefaction as they relate to three waters infrastructure is provided in Table 2.5.

Table 2.5: Consequences of liquefaction relevant for three waters infrastructure

Phenomenon	Description
Differential settlement	A difference in ground settlement between two points which can cause damage to three waters infrastructure.
Sand and water ejected to the surface (sand boils)	This exacerbates differential settlement and can result in ingress of liquefaction ejecta that blocks buried pipes and damages buildings and plant associated with the network.
Reduced support to structures bearing above the liquefied soil	Bearing capacity of the soil could be reduced resulting in subsidence of pipes and associated buildings.
Buoyancy effects	Liquefaction can result in upward movement (floatation) of manholes, tanks and other buried vessels being subject to buoyancy effects.
Area-wide liquefaction-induced settlement	Liquefaction of deeper soil layers can induce area wide settlement that may affect the performance of wastewater infrastructure.
Lateral spread	Land above the liquefied soil layer moving either down slope or toward a free edge such as a stream channel. This total and differential lateral movement can cause severe damage to wastewater infrastructure built on top of or within the land subjected to lateral displacement.

3 Methodology

The broad methodology applied to develop the earthquake hazard scenarios and estimate the damage to the GDC three waters assets is outlined in Table 3.1. Further information about each step in the methodology is provided in Sections 3.1 – Section 3.5. The results of the assessment are presented in Section 4. The limitations associated with the assessments and methodology are described in Section 6.

Table 3.1: Methodology to estimate asset damage

Step	Inputs	Process	Outputs
1 Collate and attribute asset information (Section 3.1)	• Geospatial asset information. • Valuation information. • Asset data.	Standardise attributes naming convention for utility and asset type and link the geospatial asset data to the valuation schedule	Asset attributes: • Asset location. • Asset type. • Utility type. • Replacement cost.
2 Develop earthquake scenarios (Section 3.2)	• Ground Motion Prediction Equations (GMPE). • Fault characteristics. • National Seismic Hazard Model. • NZ Vs30 model.	Apply GMPE's to model the likely distribution of earthquake shaking intensity for 500 and 1,000 year Annual Recurrence Intervals (ARI) scenarios across the assessment region	Earthquake intensity parameters: • Peak Ground Acceleration (PGA). • Peak Ground Velocity (PGV). • Earthquake Magnitude (M_W).
3 Estimate depth to groundwater (Section 3.3)	• Geotechnical investigation records. • Surface water levels. • Digital Elevation Model (DEM).	Interpolate between known and inferred groundwater depth points with a DEM and LiDAR data	Depth to groundwater (GWD) spatial model
4 Assess liquefaction vulnerability (Section 3.4)	• Geological and geomorphological information. • Geotechnical investigations. • GWD. • PGA.	Using ground investigations, develop LSN response curves for given Mw, PGA and GWD	Liquefaction vulnerability parameters: • Liquefaction Severity Number (LSN). • Lateral spread buffer.
5 Estimate asset damage (Section 3.5)	• PGV. • LSN. • Lateral spread buffer. • Asset attributes.	Associate hazard intensity exposure with assets and use damage functions to estimate damage	Damage outputs for asset: • Pipes – No. of breaks. • Structures – Damage state.

3.1 Asset Information

For each asset, a utility type (e.g. water supply, wastewater or stormwater), and asset type (e.g. treatment plant, reservoirs, pump station) is determined based on the provided spatial file names or attributes and descriptors within the data. This is to allow for selection of appropriate damage vulnerability functions.

A summary of the completeness of each of the asset datasets is presented by lines (e.g. pipes), points and polygons (e.g. structures, pump stations, manholes, valves etc.) in Appendix A. This shows the relative ratio for network utility containing data relevant for estimating the level of damage and subsequent loss (e.g. asset type, age, total life). All features are shown in Appendix A Table 1 in Appendix A.

3.2 Develop earthquake scenarios

A deterministic (or scenario-based) seismic hazard assessment can be used to model the distribution and levels of shaking over a region for individual earthquake events. For this assessment, earthquake scenarios were developed that result in approximately 500 and 1,000 year Average Recurrence Interval (ARI) levels of shaking at the centre of the GDC assets. Based on Module 1 of the NZGS Guidelines (Section 2.1.3) , the target levels of shaking for the 500 and 1,000 year ARIs have been established for this assessment, and are summarised in Table 3.2 (MBIE & NZGS, 2021).

Table 3.2: PGAs by ARI for GDC used for this assessment

ARI (years)	PGA (g)
500	0.65
1000	0.87

An earthquake scenario that would generate a 500 year ARI level of shaking was modelled by considering a rupture on the Gable End Fault with parameters as defined in Stirling et al. (2012), using the Bradley (2013) Ground Motion Prediction Equation (GMPE) to model a distribution of ground shaking. The Hikurangi Subduction Zone was used as the source model for the 1000-year ARI level of shaking with fault parameters defined by Stirling et. al 2012, and with the Parker et. al. (2020) GMPE used to model the distribution of ground shaking. The Foster et al (2019) Vs30 model for New Zealand has been used to estimate the spatial distribution of the Vs30 parameter. Two scenarios were then developed that produce PGAs aligning to the target levels of shaking for both the 500 and 1,000-year ARI at the centre of the GDC assets.

Peak Ground Acceleration (PGA) grids for the region were generated using the Bradley (2013) GMPE with the 83rd percentile ground motion used for scenario 1 (500 year ARI) and 92nd percentile ground motion used for scenario 2 (1000 year ARI) to produce the targeted levels of shaking at the centre of assets for this assessment. The percentiles refer to earthquake-to-earthquake variability only as presented in the Bradley (2013) GMPE rather than the combined variability from earthquake-to-earthquake and spatial variability. The output of the scenario analyses produced a spatial grid of PGA for a 100 m cell size.

Once the PGA scenarios were developed, the Peak Ground Velocity (PGV) was modelled using the Chiou and Youngs (2008) GMPE. The same percentiles for the ground motion input parameters as in the PGA scenarios were used. The output of the GMPE produced a spatial grid of PGV for a 100 m cell size. Note that both the Bradley (2013) and Chiou and Youngs (2008) GMPEs provided estimates of the average expected shaking intensity. Near-fault or directionality effects were not considered. These can affect the level of shaking and the orientation of maximum shaking intensity, however, are generally more important for longer periods of shaking (e.g. not significant for PGA).

The modelled Hikurangi Subduction Zone scenario produces a high level of shaking across the entire district compared to the Gable End scenario. The subduction zone interface, where the Pacific plate subducts beneath the Australian tectonic plate, is expected to produce much larger and more powerful earthquakes than shallow crust faults, with less attenuation in PGA and PGV as the distance from the fault increases. Figures are presented in Appendix D showing PGA for the two scenarios (Figures D1 & D2). The clear difference between the modelled PGA results for scenario 1 and scenario 2 is attributable to the difference in the underlying fault type used.

3.3 Estimate depth to groundwater

Groundwater depth varies both spatially and temporally within the geomorphic terrains. Natural shallow groundwater fluctuation can occur over short timescales, such as event-based changes due to rainfall, or over longer-term timescales, such as seasonal changes in rainfall patterns (annual variation), and climatic variations (e.g., El Nino events).

The methodology applied to create a depth to groundwater surface of the Gisborne region is described below.

1 Gather available groundwater observation data (e.g. investigation and piezometer records).
2 Group shallow groundwater observations by geomorphic zones.
3 For each geomorphic zone, interpolate a preliminary groundwater elevation surface from shallow groundwater observation data.
4 Compute trend model based on a best fit multiple linear regression of interpolated groundwater elevation to elevation and distance to surface water features.
5 Interpolate groundwater elevation residuals using an inverse distance weighting method.
6 Develop surface correction to ensure intersection with perennial surface water features.
7 Final depth to groundwater is calculated as the difference between ground elevation and the modelled groundwater elevation.

The applied methodology makes use of the readily available groundwater data, but this data is often sparse and lacking in temporal detail, so significant extrapolation across the study area and over time is required. For a full list of limitations refer to Section 6.

3.4 Assess liquefaction vulnerability

Liquefaction vulnerability is the likelihood of damage given the occurrence of earthquake shaking. T+T's experience in Christchurch is that damage to land depends on the soil profile, groundwater depth and the intensity of shaking (van Ballegooy and Russell, 2015). We have used this alongside available information from past studies to prepare an approximate high-level model of liquefaction vulnerability across the study area.

The following methodology has been applied to develop liquefaction vulnerability functions for the area where GDC's three waters assets are located. These functions can be used to inform loss models, in this case, expected pipe break rates following a given earthquake event. The key steps involved in the methodology are summarised below:

1 Develop geomorphological maps for the region to break areas susceptible to liquefaction into areas of similar expected performance. This requires the consideration of the geological processes and history of the study area to help understand the broad picture before liquefaction analyses are undertaken. For the purposes of loss modelling and vulnerability estimation, the available geomorphological information was simplified, mainly driven by the location and spatial density of assets (Appendix D, Figure D3).

2 Compute a liquefaction vulnerability parameter, in this case the Liquefaction Severity Number (LSN; van Ballegooy et al., 2013), as a function of earthquake shaking (PGA), Magnitude (M_W) and Groundwater Depth (GWD) at each geotechnical investigation[2] location using a simplified liquefaction assessment[3] (Tonkin + Taylor, 2015). LSN values are computed for a set of pre-defined PGA, M_W and GWD increments.

3 When multiple geotechnical investigations are located within the same geomorphic terrain, group all LSN values and derive representative LSN distributions for each PGA, M_W and GWD increment.

4 For areas with the same geomorphology which do not have any geotechnical data, representative LSN distributions are inferred from areas of similar geomorphology[4]. As geotechnical investigations become available within a region in future the model can be updated to reduce the uncertainty associated with this assumption.

Lateral spread is an additional hazard which can impact three waters infrastructure. To account for lateral spread, a 200 m buffer has been drawn around major mapped water bodies (as identified on the available 1:250,000 and 1:50,000 scale topographic maps). The factor is a function of PGA and is added to the LSN distributions of geomorphologies within the 200 m buffer. The increase in LSN acts as a proxy to the increased damage that is likely to be caused by lateral spread in these areas.

The above methodology enables liquefaction vulnerability functions to be developed for areas that have sparse geotechnical data in the same manner as areas with abundant data. Developing common functions for each geomorphological area has resulted in a standardised procedure for assessing liquefaction vulnerability at different levels of earthquake shaking, magnitude and groundwater depths across a region. This procedure can also be applied to other regions in a similar manner, and (with some limitations) the outputs can be used for other aspects of loss modelling.

[2] Preference is given to the use of CPT data for this purpose. When there is insufficient CPT data these parameters are inferred from other available borehole information.
[3] A 50th percentile probability of liquefaction triggering (P_L) was applied because it is considered the most appropriate for vulnerability assessments and loss estimation.
[4] There is relatively poor distribution of geotechnical investigations outside of the Poverty Bay Flats region, this is a key source of uncertainty.

The applied methodology makes use of the readily available geotechnical data, but this data is often sparse. There are also significant uncertainties when predicting triggering of liquefaction and the resulting consequences, especially for a high-level region-wide study such as this. For a full list of limitations refer to Section 6.

3.5 Estimate asset damage

The following methodology has been applied to estimate distributions of the expected number of breaks per pipe, and the expected degree of damage from a seismic event for:

- Structures (e.g. treatment plants for wastewater and water supply).
- Pump stations.
- Tanks.
- Reservoirs (water supply and stormwater).

The key steps involved in the asset damage estimation methodology are summarised as follows:

1 Break up spatial pipe features into maximum 10 m segments. In some cases the process results in pipe segments shorter than 10 m.

2 For each pipe segment and structure, look up the modelled groundwater depth and geomorphology at its midpoint, along with the modelled earthquake shaking intensity (PGA and M) for a given seismic scenario.

3 Using the input values from Step 2, determine an LSN value for each pipe segment and structure by randomly selecting a value from the LSN distribution (see Section 3.3).

4 Estimate an expected break rate and the number of breaks per pipe or an expected structure damage state:

   a For each pipe segment, estimate a break rate as a function of shaking (i.e. PGV; Bouziou & O'Rourke, 2017), liquefaction (i.e. LSN; Bouziou et al., 2019) and pipe type. The expected number of breaks per pipe is then estimated by multiplying the break rate per segment by the segment length and summing all the expected number of breaks for each segment together.

   b For each structure, estimate a damage state as a function of shaking (i.e. PGA) and liquefaction (i.e. LSN) applying FEMA (2013) damage functions[5].

5 Steps 3 and 4 are repeated 100 times, creating a distribution of the expected number of breaks per pipe and a distribution of expected damage state for each structure. The 10th, 50th and 90th percentiles are then extracted from these distributions.

The modelled damage distribution outputs can be subsequently used to estimate the expected financial cost due to the estimated damage to pipes and key structures within the network. Additionally, with further analysis, these modelled outputs can be used to identify vulnerable components and structures, and to assess overall network resilience and outage-related risks.

[5] Modified using engineering judgement to account for liquefaction damage.

4 Results

The results from the above methodology are provided for individual assets to Aon in spreadsheet format. The findings are summarised below.

The final results for pipe assets are a modelled number of breaks at 10th, 50th and 90th percentiles for each asset. The total length and percentage of network pipe assets by utility type (at the 50th percentile number of breaks) for the two modelled seismic scenarios are shown in Table 4.1.

Table 4.2 summarises the number of point structures, for each utility and asset type modelled at the 50th percentile damage state for the two seismic scenarios. For the purposes of this report, damage to structures is classified into five categories, these are described in Appendix B Table 1. For the 500 and 1,000 year ARI seismic events, the water supply network has been identified as the most vulnerable.

Table 4.2 only shows the type of assets where damage can be modelled using published damage functions (i.e. treatment plants, pump stations and reservoirs) (FEMA, 2013). For assets where damage is not assessed (e.g. manholes and valves), we understand the financial value attributed (as assessed by Aon) is associated to the nearest pipe damage.

We note that there are inherent uncertainties and assumptions made at each stage of this assessment. These can affect the final results of the damage assessment. The areas of uncertainty in the modelling methodology, the effects these can have on the damage assessments and potential solutions to reduce these uncertainties are presented in Appendix C.

Table 4.1: Summary table of the network pipe length and percentage for the median number of breaks by utility for the 500 and 1,000 year ARI seismic events

Event		Median number of breaks (m of pipe)					Median number of breaks (% of network)				
	Break range	0 - 0.05	0.05 - 0.2	0.2 - 0.5	0.5 - 1	> 1	0 - 0.05	0.05 - 0.2	0.2 - 0.5	0.5 - 1	> 1
500 Year	Water supply	186258	125656	86304	26129	29622	41	28	19	6	7
	Wastewater	124170	107246	100996	8290	14641	35	30	28	2	4
	Stormwater	76239	83394	71310	14876	10082	30	33	28	6	4
1000 Year	Water supply	141586	96350	66633	84749	64651	31	21	15	19	14
	Wastewater	58518	115257	72131	86405	23033	16	32	20	24	6
	Stormwater	31710	66863	68654	61034	27640	12	26	27	24	11

Table 4.2: Summary table of the number of point assets (of each type and utility) at the 50th percentile damage state for the 500 and 1,000-year ARI seismic events

Scenario Event	Utility	Asset Type	50th percentile damage state (refer Appendix B Table 1)				
			None	Minor	Moderate	Extensive	Complete
500 year event	Wastewater	Pump Station	0	4	1	11	27
		Tank	0	0	0	4	2
		Reservoir	0	0	0	0	0
		Treatment Plant	1	1	0	0	1
	Water supply	Pump Station	0	4	4	4	2
		Reservoir	0	0	16	11	0
		Treatment Plant	0	0	0	0	0
		Tank	1	6	0	2	0
1000 year event	Wastewater	Pump Station	0	0	0	4	39
		Tank	0	0	0	0	6
		Reservoir	0	0	0	0	0
		Treatment Plant	0	0	0	0	3
	Water supply	Pump Station	0	0	0	7	7
		Reservoir	0	0	0	25	2
		Treatment Plant	0	0	0	0	0
		Tank	0	0	0	4	5

5 Potential further work

The primary intended application of this work is for Aon to use the damage model output for each of the considered earthquake scenarios to develop estimates of financial loss. This financial loss estimate can be subsequently used to inform risk transfer solutions (e.g. insurance cover) for the assets.

Further work can be undertaken to reduce the uncertainties associated with the assessment. The identified uncertainties and potential further work are summarised in Appendix C Table 1, Appendix C. In addition to the scenarios adopted in this report, this same damage assessment framework can be used to extend the analysis to include other earthquake scenarios with different recurrence intervals and varying spatial distribution of ground motions, e.g. more frequent but smaller earthquakes. Where applicable, it can also be used to assess damage to other asset types e.g. roads and buildings.

A secondary benefit of the damage modelling described in this report is to use the damage assessment (and any further extensions) as an input to inform an *asset risk assessment* which may be undertaken to help understand likely post-event system performance. In order to do this, further analysis would be required, along with a review of network criticality. This could be used to inform asset management strategies including the prioritisation of upgrades where assets are identified which are both *critical* and *vulnerable*.

The *asset risk assessment* could further be used for emergency management and crisis planning. This can help to identify the potential population effects (e.g. migration patterns) and economic effects (e.g. business continuity) in a post-disaster environment. It is useful to note that even a small percentage of infrastructure damage can have a significant impact on the number of people affected by service outage.

6 Limitations

This analysis has considered a limited number of earthquake shaking scenarios and as natural hazard events are intrinsically unpredictable, there is uncertainty attached to the results. The results and findings in this report have been reached through a series of qualitative assessments in combination with various assumptions and limitations. Please note the following in particular:

- The attribution of asset and valuation data and its accuracy is reliant on the information supplied by the GDC. We accept no responsibility for the accuracy or completeness of the underlying information provided.
- Any form of mathematical and/or empirical analysis and modelling (including that used in the preparation of this document) will produce results that differ from actual events or losses.
- The review and modelling of the natural hazard scenarios was desk-based and its accuracy is reliant on the information supplied by the GDC and/or selected third party sources. We accept no responsibility for the accuracy or completeness of the underlying information provided.
- No assessment of the following damage mechanisms has been undertaken as part of this assessment:
  - Tectonic subsidence/uplift,
  - Global settlement associated with liquefaction,
  - Surface fault rupture,
  - Ground deformation/displacement (outside of the ground deformation types described in Section 2.2),

  The above damage mechanisms may result in further losses to the three waters network.
- A high-level estimation of damage caused from lateral spread has been undertaken as part of this assessment. This has been based on using LSN values as a proxy and is suitable for a regional scale assessment, however, should not be utilised in further detailed analysis.
- No estimation of damage caused from landslide inundation has been undertaken as part of this assessment. Landslide inundation may therefore result in further losses to the three waters network, which have not been quantified in this assessment.

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8 Applicability

This report has been prepared for the exclusive use of our client Aon New Zealand, with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

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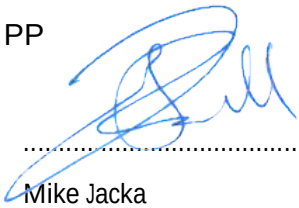

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Mike Jacka

Technical Director – Earthquake Geotechnical Engineering

Appendix A Asset information

- Appendix A Table 1: Standard attributes required (majority available ✓, partially complete ● majority unavailable ✘) – GDC Three Waters Network Assets

Appendix A Table 1: Standard attributes required (majority available ✓, partially complete ● majority unavailable ✖) – GDC Three Waters Network Assets

	Three waters Network WS – Water supply SW – Stormwater WW – Wastewater			Attribute availability ✓ Majority available (> 85%) ● Partially complete (50-85%) ✖ Majority unavailable (< 50%) ⊘ No data N/A Not Available		
	Line Pipes			Point Manholes Valves Hydrant Outfalls Connection		
Standard attributes	WS	SW	WW	WS	SW	WW
Asset ID	✓	✓	✓	✓	✓	✓
Utility(TT)	✓	✓	✓	✓	✓	✓
Assettype (TT)	✓	✓	✓	✓	✓	✓
Installation date/Age	✓	✓	✓	✓	✓	✓
Address/Location (** District only)	✓**	✓**	✓**	✓**	✓**	✓**
Diameter	✓	✓	✓	N/A	N/A	N/A
Material (TT)	✖	✖	✖	N/A	N/A	N/A
Length	✓	✓	✓	N/A	N/A	N/A

Appendix B Structural damage category definitions

- Appendix B Table 1: Structural damage category definitions (after FEMA, 2013)

Appendix B Table 1: Structural damage category definitions (after FEMA, 2013)

Category	Definition
None	No damage
Slight/Minor	Malfunction of plant for a short time (less than a few days) and slight damage to equipment and buildings.
Moderate	Malfunction of plant for about a week. Considerate to extensive damage to components, equipment and electronics and moderate damage to buildings.
Extensive	Extensive damage to equipment and buildings resulting in loss of services likely beyond repair
Complete	Defined by complete failure and collapse of structures and buildings.

Appendix C Uncertainties and assumptions

- Appendix C Table 1: Summary table of the sources of uncertainty and assessment assumptions, and potential improvement methods

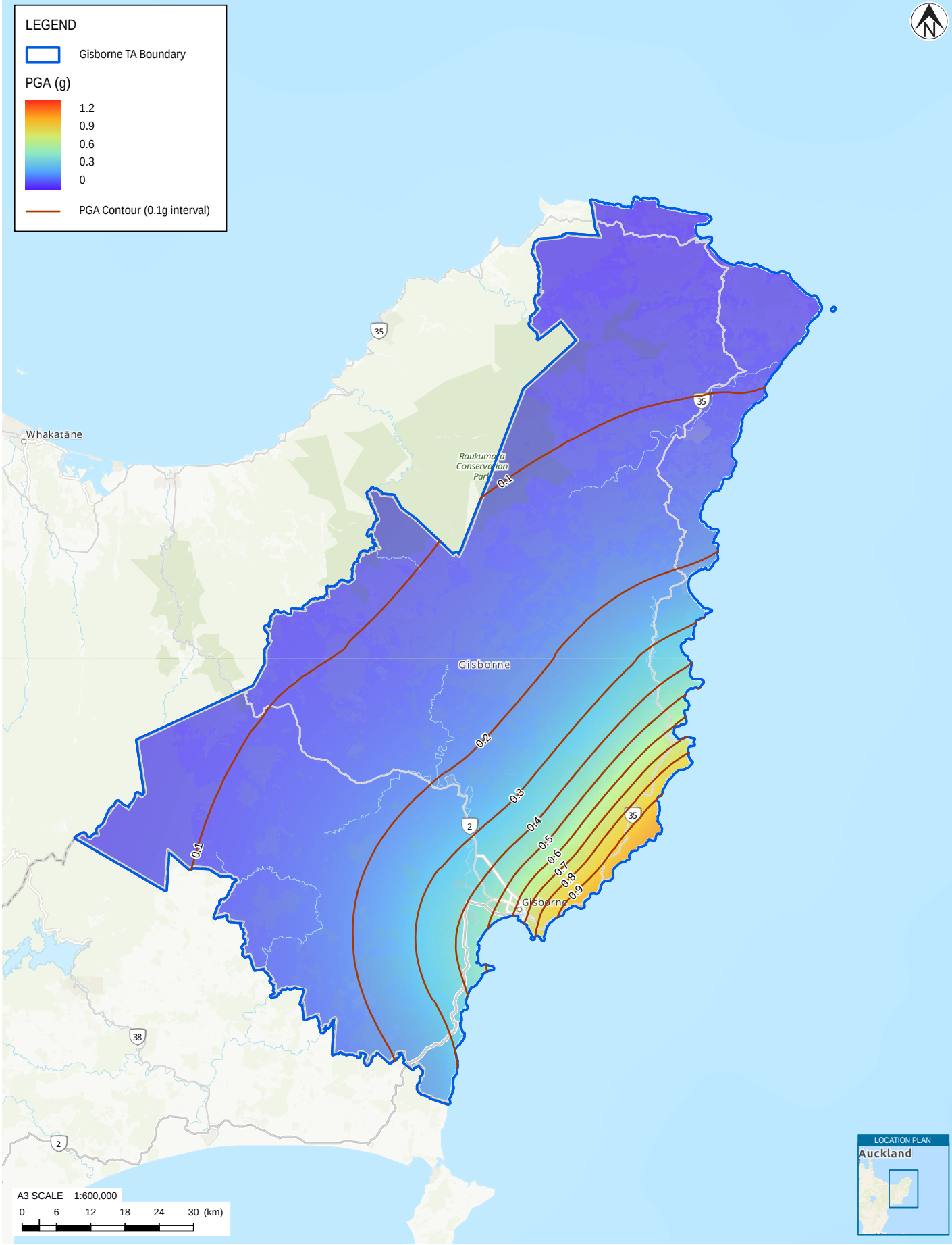
Appendix C Table 1: Summary table of the sources of uncertainty and assessment assumptions, and potential improvement methods (see note 1)

Source of uncertainty	Description	Impact on asset damage assessment	Future Improvement
Asset valuation	Reliance on the portfolio valuation and given the incomplete valuation schedule join to assets, the schedule could be underrepresented.	Insignificant – However, this may result in a misrepresentation of the overall financial asset loss determined by Aon.	Replacement value attributed to every assessed asset.
Earthquake shaking scenario	Using ground motion prediction equation to develop the scenario averages ground shaking from the fault source, does not take into consideration directionality of the rupture.	Insignificant – As it applied average shaking produced for all the earthquake rupture possible events (e.g. direction of fault rupture, depth of rupture).	Develop and apply physics based seismic scenario which contains rupture specific characteristics such as rupture directionality.
	Only two deterministic fault rupture scenarios are adopted for the assessment	Moderate – there are many other fault ruptures that could occur, which would give a different pattern of shaking intensity and therefore different estimates of damage.	Undertake a probabilistic approach to modelling seismic hazard. This is beyond the current scope and would add significant cost to the assessment.
	Seismic scenarios developed using the available fault rupture parameters from the 2012 NSHM, as 2022 NSHM parameters were not publicly available at the time of assessment	Minor – Changes to targeted levels of shaking are small relative to the uncertainties inherent in the overall damage model process	Use 2022 NSHM fault rupture parameters to model seismic scenarios when the information becomes available.
Groundwater model	Data scarcity	Minor – Lack of data to ground truth shallow groundwater conditions	Increased density of data
	Seasonality of data	Minor – Water table fluctuations are on the scale of ±3 m throughout the year based on LAWA wells	Spatially distributed transient data
	Quality	Minor – Most water level measurements are taken after drilling which can influence the observed static water level by ±2 m	Accurate measurements
	Classification	Insignificant – Coarser scale method which does not capture local-scale spatial variation within geomorphic units.	More data to draw more robust statistical relationships.
Liquefaction	Lack of geotechnical investigations across the regions.	Minor – CPT data is not well distributed in the region.	Conduct further CPT and ground investigations across the region. Conduct more research to advance liquefaction triggering understanding.
	Applying the average ground responses from one geomorphology type from one area to another where ground investigations were not conducted.		
	Limitations to liquefaction science (using simplified triggering methods and calculating LSN).		
Lateral spread	Lateral spread is not directly considered in this assessment when estimating asset damage as methodology for attributing damage has not been established.	Minor – Some assets are within identified lateral spread potential areas.	Develop a detailed lateral spread hazard input and methodology for estimating damage attributed to lateral spread.
Infrastructure damage	Applying "generalised" published fragility functions.	Minor – Specific infrastructure functions that allow for New Zealand design standards and potential liquefaction damage would be beneficial.	Await future developments in fragility functions based on research in this field.

Note 1 – It is important to note that the qualitatively assessed significance of the uncertainties described in this table pertain to the damage modelling described in this report only. These uncertainties may have greater significance if this assessment is used to inform other matters.

Appendix D Figures

- Figure D1 – 1 in 500 year Seismic Event
- Figure D2 – 1 in 1000 year Seismic Event
- Figure D3 – Gisborne geomorphology



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NOTES:
1 in 500 year event modelled using Gable End Fault scenario, scaled to GDC asset center. Aotearoa New Zealand Hillshade - Alpha: Eagle Technology, Land Information New Zealand. NZ Navigation Map: Eagle Technology, LINZ, StatsNZ, NIWA, Natural Earth, © OpenStreetMap contributors.. NZ Topographic Relief (Vector): Eagle Technology, LINZ, StatsNZ, NIWA, Natural Earth, © OpenStreetMap contributors.

REV	DESCRIPTION	GIS	CHK	DATE
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PROJECT No.	29730.1014		
DESIGNED	DXLR	DEC.22	
DRAWN	DXLR	DEC.22	
CHECKED	CHSA	DEC.22	
APPROVED	MEJ	JAN.23	

CLIENT **AON NEW ZEALAND**
PROJECT **GISBORNE DISTRICT COUNCIL**
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1 IN 500 YEAR SEISMIC SCENARIO
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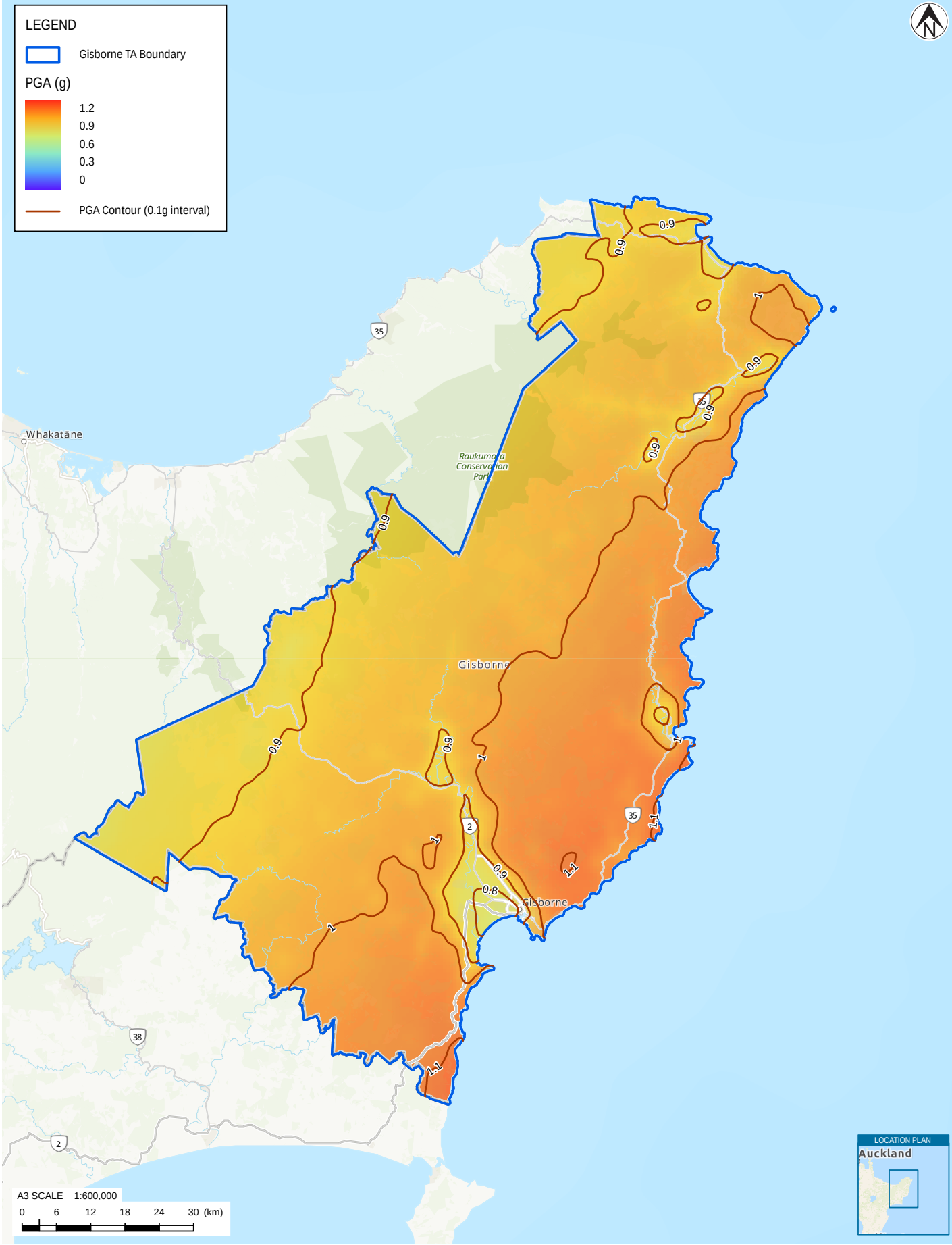

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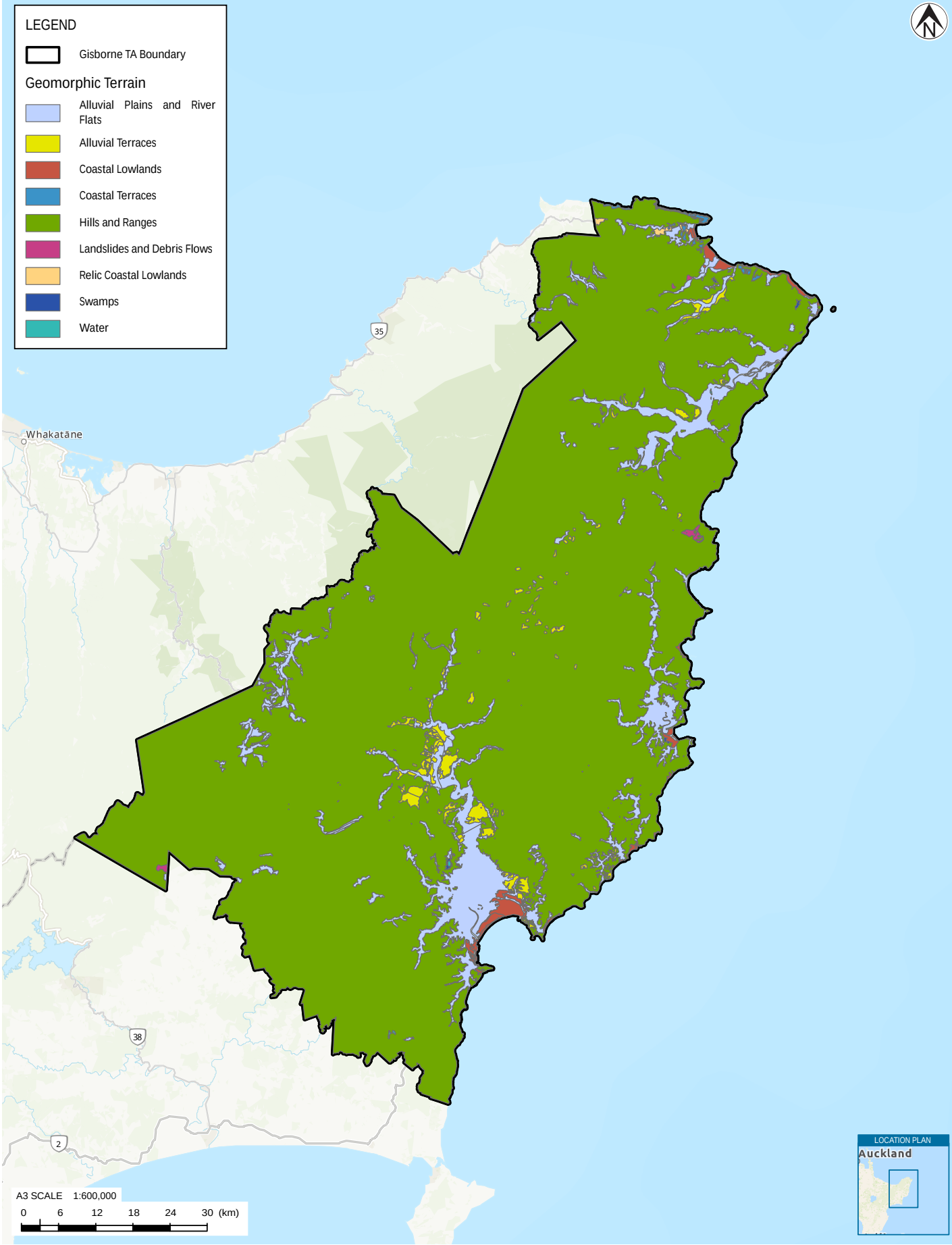
NOTES:
1 in 1000 year event modelled using Hikurangi Subduction Zone scenario, scaled to GDC asset center. Aotearoa New Zealand Hillshade - Alpha: Eagle Technology, Land Information New Zealand. NZ Navigation Map: Eagle Technology, LINZ, StatsNZ, NIWA, Natural Earth, © OpenStreetMap contributors.. NZ Topographic Relief (Vector): Eagle Technology, LINZ, StatsNZ, NIWA, Natural Earth, © OpenStreetMap contributors.

REV	DESCRIPTION	GIS	CHK	DATE
0	First version	DXLR	CHSA	22/12/22

PROJECT No.	29730.1014		
DESIGNED	DXLR	DEC.22	
DRAWN	DXLR	DEC.22	
CHECKED	CHSA	DEC.22	
APPROVED	MEJ	JAN.23	

CLIENT **AON NEW ZEALAND**
PROJECT **GISBORNE DISTRICT COUNCIL**
TITLE PROBABLE MAXIMUM LOSS MODELLING
1 IN 1000 YEAR SEISMIC SCENARIO
SCALE (A3) 1:600,000 FIG No. FIGURE 1. REV 0



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C:\Work\Projects\AON\Gisborne_29730.1014\AON_GDC_LocalMap\AON_GDC_LocalMap.aprx Layout: T+T A3 Portrait Appendices 2022-Dec-12 3:45 pm Drawn by DXLR

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NOTES:
Basemap NZ Topographic - Basemap Only: Eagle, LINZ, StatsNZ, OSM. NZ Navigation Map: Eagle Technology, LINZ, StatsNZ, NIWA, Natural Earth, © OpenStreetMap contributors.. NZ Topographic - Reference Labels: Eagle, OSM

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CLIENT **AON NEW ZEALAND**
PROJECT **GISBORNE DISTRICT COUNCIL**
TITLE PROBABLE MAXIMUM LOSS MODELLING
GISBORNE GEOMORPHOLOGY
SCALE (A3) 1:600,000 FIG No. FIGURE 3. REV 0

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ATTACHMENT 1 - Policy Descriptions

Cover	Description	Deductibles	Limit of Liability (BOPLASS)	Sublimit of Liability (GDC)
Material Damage (excluding Fire)	All risks including earthquake, but excluding fire.	Each claim $25k. **Natural disaster perils:** 5% of Material Damage site value, minimum $5k each site Pre-1935 property 10% of Material Damage site value, minimum $10k each site.	$2.968b across BOPLASS	Various sublimits as per GDC Material Damage site schedule.
Material Damage (Fire)	Fire, including fire caused by any natural disaster.	Each claim $25k. 5% of Material Damage site value, minimum $5k each site. Pre-1935 property 10% of Material Damage site value, minimum $10k each site.	$30m	Various sublimits as per GDC Material Damage site schedule.
Business Interruption	Consequential Loss resulting from physical loss or damage to any property used by the Insured.	Various loss period deductibles	$ 8m Additional Increased Costs of Working (shared). $ 650k Claims Preparation. Indemnity Period: 24 Months.	$ 302,000 Loss of rents receivable. Indemnity Period 24 Months.
Infrastructure Insurance (below ground assets)	Physical loss caused by a Natural Catastrophe Event including: Earthquake, Natural Landslip, Flood, Tsunami, Tornado, Windstorm, Volcanic Eruption, Hydrothermal & Geothermal activity and Subterranean Fire and resulting Business Interruption.	$1.5m	$500m combined across BOPLASS councils	$250m Gisborne District Council
Machinery Breakdown/ Boiler Explosion	Machinery breakdown risks and Boiler explosion risks normally excluded under the Material Damage - Excluding Fire policy.	Per claim $2k Transformers Up to $20,000 in Value and/or Pumps in excess of 30kw – $5k Transformers in Excess of $20,000 in Value – $10k		$1m Gisborne District Council
Forestry	Forests as declared against loss to trees including harvested trees awaiting transportation from harvest area caused by Fire, Hail Strike, Malicious Damage and Impact.	0.75% of total sum insured for each forest location separated by >5km. Minimum of $10k per claim.		$1.3m Gisborne District Council

Cover	Description	Deductibles	Limit of Liability (BOPLASS)	Sublimit of Liability (GDC)
Motor Vehicle	Unforeseen and unintended damage to own vehicles.	Standard 1% vehicle sum insured, minimum of $500 Plus Age and Inexperienced drivers excess applicable to all Insured Vehicle, when being driven by any person: Under 21 years of age $1,000 Aged 21 to 25 years of age $500 Aged 25 and over and licensed less than 2 years $500	**Third Party Liability** Property Damage $20m Bodily Injury $20m Aggregate Limit $20m	**Own Damage** Market Value of the Insured Vehicle at the time of loss
Combined Public Liability and Professional Indemnity	**Public Liability** Liabilities to third parties for property damage and/or personal injury arising from and in connection with the Insured's operations, for all amounts which the Insured is held legally liable to pay. **Professional Indemnity** Claims made or notified during the period of insurance arising from an actual or alleged acts, errors or omissions or conduct omitted or committed in connection with the services provided by the Insured.	**Public Liability (Primary)** Each claim - costs and expenses inclusive - $10k. **Professional Indemnity (Primary)** Each claim - costs and expenses inclusive - $25k Other than claims relating to Building Act – $100k	**Public Liability** (shared BOPLASS) Any one occurrence & in the aggregate anyone period of insurance - $145m. **Professional Indemnity** (shared BOPLASS) Any one occurrence & in the aggregate anyone period of insurance - $145m.	**Public Liability** (Primary) Any one occurrence & in the aggregate anyone period of insurance - $15m. **Public Liability** (Primary) Any one occurrence & in the aggregate anyone period of insurance - $15m.
Combined Harbourmaster's Liability & Wreck Removal	All sums for which the Insured is legally liable for whilst exercising the statutory powers and duties of Harbour Master	**Harbour Masters Liability** Each and Every Loss, Costs Inclusive - $50k **Wreck Removal** Each and Every Loss, Costs Inclusive - $100k	**Harbour Masters Liability** Any one Claim and in the Annual Aggregate in Any One Period of Insurance - $10m **Wreck Removal** Any one Claim and in the Annual Aggregate in Any One Period of Insurance - $10m **Defence Costs** Any one claim and aggregate in any one period of insurance -$1m	

Cover	Description	Deductibles	Limit of Liability (BOPLASS)	Sublimit of Liability (GDC)
Combined Employers Liability & Statutory Liability	**Employers Liability** Liability arising out of claims made by Employees for Bodily Injury outside the scope of the Accident Compensation Corporation scheme. **Statutory Liability** Defence Costs, Fines (to the extent allowable by law), and Reparation Orders arising out of an unintentional breach or breaches of an Insured Act.	**Employers Liability** $1k Each & Every Claim (including Defence Costs) **Statutory Liability** $10k Each & Every Claim (including Defence Costs)	**Employers Liability** $1m in the aggregate for Loss (excluding Defence Costs) $1m in the aggregate for defence costs **Statutory Liability** $1m in the aggregate for Loss (excluding Defence Costs) $1m in the aggregate for defence costs	
Fidelity Guarantee (Crime)	Direct financial loss suffered by the Insured as a result of a criminal act committed by an employee and arising from or connection with any single, continuous or repeated acts.	$50k Each & Every Claim (including Costs)	$2m Any one loss and in the aggregate any one Period of Insurance.	
Personal Accident	Covering Insured persons for benefits in respect of injury (including death) as a result of an accident. Cover includes 270 Full Time Staff, plus 107 part-time, fixed term, casual staff and Elected Members		$100k per claim, $1m aggregate during any one period of insurance. For all claims during any one period of insurance for accidents occurring during non-scheduled air travel $500k. Various prorated benefits including: • Accidental death and disablement • Weekly Injury Benefit • Fractured Bones • Bodily injury resulting in Surgery outside NZ • Bodily injury resulting in loss or damage to teeth • Sickness resulting in surgery	

Cover	Description	Deductibles	Limit of Liability (BOPLASS)	Sublimit of Liability (GDC)
Travel	All employees, directors and councillors of the Insured or persons authorised by the Insured travelling overseas on authorised business travel or private travel if declared by the Insured, Spouses (including common-law) and families of an Insured Person.	Each and every claim $0 Electronic Equipment only $250	Various, including limits for: • Care and concierge • Overseas medical and evacuation • Cancellation and disruption • Baggage and personal effects • Personal accident and sickness • Vehicle excess waiver • Personal liability • Kidnap ransom and detention • Political and natural disaster evacuation • Search and rescue expenses • Alternative employee/resumption of assignment • Health • Wellbeing	
Cyber Liability	Costs associated with managing and recovering from a significant cyber-attack.	$25k Each and every claim, actual or suspected breach or extortion threat.		$2.5m in the aggregate (excluding damages) $2.5m in the aggregate for damages.
Marine Hull	Unintended and unforeseen physical loss or damage to insured vessel	$500 each and every claim		**Third Party Liability** $5m

ATTACHMENT 2: Assets insured or not insured

ASSETS INSURED

Material Damage (above ground assets)	Classes of assets insured include: • cemetery assets (e.g. crematorium) • staff and community housing (e.g. pensioner flats, dwellings, garages) • community property (e.g. museum buildings) • Gisborne airport (e.g. land and airside assets) • reserves assets (e.g. buildings, changing sheds, grandstands) • library • monuments (e.g. sculptures, memorials, fountains) • Olympic Pool (e.g. pools, buildings covers) • toilets (Bright St & Inner city Harbour • theatres soil conservation reserves (e.g. dwellings, buildings) • water supply assets (e.g. treatment plants, reservoirs, pump stations) • waste water assets (e.g. treatment plants, pump stations
Infrastructure (below ground assets)	Classes of assets insured include: • flood control (e.g. stopbanks, channels, culverts, rip-rap, groynes, piles) • solid waste (e.g. bores, leachate systems) • sewer (e.g. reticulation, manholes, service lines, pump stations and control systems) • stormwater (e.g. reticulation and in drain structures) • water (e.g. dams, bores and filters, reticulation pipes) Infrastructure assets have a declared value of $586m (2022/23). In a natural disaster, current arrangements are that central government will pay up to 60% of restoration costs for damage to infrastructure services, assuming those assets have been properly maintained and that the local authority can meet costs for the remaining 40%. Council is insured for its 'share' up to $250m.
Vehicles	All vehicles are insured except rural fire vehicles and tankers.
Machinery breakdown	Major generators, pumps and switchboards including the Wastewater Treatment Plant.
Forestry	Council owned woodlots (67ha) and Waerenga O Kuri Reserve (170ha), but not including Pamoa joint venture (insured by Juken NZ).

ASSETS NOT INSURED

There are a number of reasons why council does not insure all assets, some of which include:

- assets are not insurable (e.g. land)
- intangible assets (e.g. software, digital aerial photography)
- compound assets, bought as one but unlikely to be lost together (e.g. street furniture, fencing)
- assets not likely to be replaced if destroyed (e.g. Churchill Park Goal)
- small value assets and plant under the minimum material damage insurance excess (deductible) which is currently $25k
- living assets (e.g. river protection trees)
- assets thought to be hardy and unlikely to be fully lost (e.g. concrete block toilets, boat ramps, car parks)
- gifted assets that cannot be replaced in their current form (e.g. artworks and public art)
- assets that are 'self-insured' and damage subsidised by grants (e.g. local roads and bridges).
- motorbikes and other lower value vehicles.

Non-insured assets that are lost/damaged are generally replaced by operational maintenance budgets or by Long Term Plan/Annual Plan capital budget items.

Attachment 4 – Insurance Strategy – Status and timelines

Insurance Strategy tasks for 2022/23 financial year

Insurance Strategy	Risk Profile	Tasks	Activity	Status	Comments/Issues
1. Adopt appropriate valuation methods for insurance.	Critical	1.1	• Use consistent methodology based on asset manager's knowledge and financial reporting.		• External insurance valuations have been completed and supplied to Council's broker to inform 2022/23 policy negotiations.
2. Undertake earthquake probable maximum loss assessment for infrastructure assets.	Critical	2.1 2.2	• Assess Probable Maximum Loss from Earthquake Hazard to Infrastructure – 2022 RFP prepared by Council's broker. • Ensure financial risk retention levels are both acceptable and tolerable. In response to content in completed report.		• The report has been summary of loss estimates for GDC, including demand surge (DS. • The Final Report was received in February 2023. • The broker has informed Council that in carrying out this report, we are taking a proactive step to understand and manage further exposures.
3. Update insurance asset schedule and approaches (i.e., low value assets).	Critical	3.1	• Assess assets to determine whether to insure and, if insured, determine the appropriate basis of settlement (i.e. reinstatement, indemnity or declared conditions).		• The Council Material Damage Policy insures 183 Council assets ranging in value from $3,800 to $50m. • This work is in progress.
4. Review the risk retention (or residual financial exposure).	Major	4.1	• Review Council's Risk Appetite Matrix and current process for assessing the costs and benefits of risk retention options and strategies, e.g., deductible levels, self-insurance of specific assets.	Not started	• Planned for 2023/2024 financial year.
5. Review Enterprise Risk Management framework and processes.	Major	5.1 5.2	• Review current risk maturity and establish a benchmark. • Review Enterprise Risk Management frameworks and processes with Council's managers, in line with Council's Risk Management Policy.	Not started	• Planned for 2023/2024 financial year.

Key	
Critical	Prioritise for **first year** (2022) of work plan. Impacts most significant policies by premium spend.
Major	Will be prioritised for **second year** (2023) of work programme.

Title: **23-60 Health & Safety**

Section: Health & Safety

Prepared by: David Wilkinson - Health & Safety Manager

Meeting Date: Wednesday 15 March 2023

Legal: No	Financial: No	Significance: **Low**

Report to AUDIT & RISK/ĀRAI TŪRARU ME TE TĀTARI KAUTE Committee for information

PURPOSE - TE TAKE

The purpose of this report is to update the Audit & Risk Committee with specific information on critical health, safety and wellbeing risks, and controls to mitigate these risks at all Gisborne District Council workplaces.

SUMMARY - HE WHAKARĀPOPOTOTANGA

The Gisborne District Council has duties under the Health & Safety at Work Act 2015 (HSWA) and its associated Regulations. These include:

- Applying due diligence to ensure Council, through its Chief Executive, provides resources and support to meet legal health and safety obligations.
- Ensuring that significant health and safety risks have been identified and that robust controls are implemented to mitigate these risks, and that they are reviewed regularly.
- Assurance that all workers are confident that Council is providing a safe workplace for its workers and other persons.
- Confirming that Council is compliant with health and safety legislation and striving to continuously improve health and safety systems and culture.
- Ensuring all workers are valued and that their health, safety and wellbeing is essential to the overall success of Gisborne District Council.
- Ensuring senior management and councillors are aware of their duties under s.44 "Due Diligence" and understand Council risks and resources available to mitigate.
- Providing key information relating to these matters at a governance level.
- Specific focus on the present COVID-19 situation, working collaboratively with the Risk Manager to ensure we have plans, controls and resources available.

The decisions or matters in this report are considered to be of **Low** significance in accordance with the Council's Significance and Engagement Policy.

RECOMMENDATIONS - NGĀ TŪTOHUNGA

That the Audit & Risk/Ārai Tūraru me te Tātari Kaute Committee:

1. Notes the contents of this report.

Authorised by:

James Baty - Director Internal Partnerships

Keywords: Health & Safety, risk, wellbeing, Obligations, COVID-19

BACKGROUND - HE WHAKAMĀRAMA

1. The Health & Safety at Work Act (HSWA) provides regular opportunities to review case law and related precedents together with frequent Regulator media reports.

2. Our focus continues to be on critical risks, staff wellbeing, and building a culture where all our workers feel supported, understand the risks associated with their work, and the controls needed to mitigate these. Accordingly, this report provides updates.

3. One of the key requirements of health and safety legislation is that it is mandatory to have active worker participation. We formally apply this in two ways:

   a) By having nominated Health and Safety Representatives, who cover a specific work group across Council. Currently each representative operates in this role for a period of two years. Health and Safety Representatives are consulted on worker health and safety matters, involved in investigations, meet quarterly and are given a variety of training opportunities during their term.

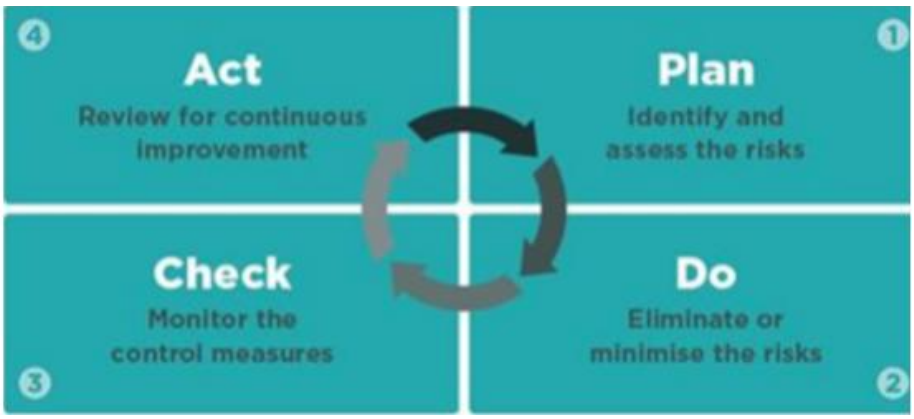
   b) All workers are encouraged to report accidents, incidents and near misses through the Damstra Safety (formally Vault) system (our health and safety management platform). A mobile VAULT/Damstra app is available, which staff are encouraged to use, and uptake remains encouraging

4. Gisborne District Council recognises that a well-functioning health and safety system relies on participation, leadership and accountability. HSWA sets out the principles, duties and rights in relation to workplace health and safety. A guiding principle of HSWA is that workers and others need to be given the highest level of protection from workplace health and safety risks, as is reasonable.

5. A review of Council's strategic risks included Health & Safety, resulting in several options to ensure ongoing continuous improvement.

6. Healthy and safe work starts with identifying and understanding what our work-related health and safety risks are. It then involves implementing what is reasonable and practicable to eliminate those risks. Where the risk cannot be eliminated, it must be minimised so far as is reasonably practicable.

7. We follow the "Plan-Do-Check-Act" four steps model to help manage our work health and safety risks:



8. We prioritise critical risks first before managing less serious risks. Teams are required to review work activities on an ongoing basis and to identify any new risks that need to be managed. We work with other businesses where we have shared work risks (e.g. share a workplace or in a contracting chain). In addition, we ask workers for input on not only identifying health and safety risks but also when choosing solutions. We believe people are more likely to take responsibility and make good choices if they have been involved in the conversation, remembering that workers are the eyes and ears of our business. They could suggest practical, cost-effective solutions and often do.

9. Teams have identified their operational risks and these, together with controls to manage these risks, and reviewed on an annual basis or post any incident/accident or near miss. We have introduced a business partnership model with teams assigned their health and safety support where the HomeSafe team collaborate and review team risks developing minimum risk guidelines for staff and contractors to follow.

10. Much of Council's medium to high-risk work is undertaken by contractors. Before becoming a Council approved contractor, a health and safety assessment is undertaken with contractors who are required to pass a pre-qualification check of their health and safety systems using our pre-qualification system SHE. 'SHE' helps us make smarter health and safety decisions, all backed by data and supported by rigorous process.

11. Changes to the pre-approval process (cross-accreditation with Totika) have been ratified and staff have been trained. Council staff who engage medium or high-risk contractors then undertake a check of any qualifications, licensing, safety plans and associated documentation before work commences. Monthly monitoring of contractors undertaking physical work is required by the person responsible for engaging or a suitable project consultant/team. Examples are the floodwater and roading network maintenance projects which have dedicated health and safety roles to verify and assure performance that is overseen by the HomeSafe team.

Identified Health and Safety Operational Risks

12. Our top ten identified operational risks are:
    - Conflict, violence, and aggression
    - Falls from heights
    - Driving and vehicle safety
    - Working in the road corridor
    - Contractor management
    - Confined spaces and access
    - Isolated, remote, lone working
    - Hazardous substances, including asbestos
    - Mental health and wellbeing
    - Staff turnover and retention.

13. The HomeSafe, Crisis Response Team (CRT) and Risk teams remain vigilant in relation to the COVID-19 situation across New Zealand and worldwide. At the time of writing this report national Covid case numbers continue to decrease. Council stocks of RAT test kits were initially exhausted due to demand from the Emergency Co-ordination Centre for the Cyclone Gabrielle event. These were restocked by Te Whata Ora. On instructions from NEMA pre-entry COVID testing and mandatory mask wearing was required for all personnel participating in the Cyclone Gabrielle Incident Management Teams (IMT).

14. Clear documentation is available to all staff via Naumai (staff intranet) and other communication channels should the present COVID situation change. We are well prepared – particularly in terms of resources, business continuity plans and the availability of PPE.

Cyclone Gabrielle

15. The HomeSafe team supports health & safety management in the Incident Management Team. Examples are:

    - Assessing elevated risks including driving
    - Reviewing contractor risk assessments
    - Supporting workers, contractors, the public and volunteers, in relation to their wellbeing, including managing fatigue and mental health.

16. Silt removal and disposal is identified as an elevated risk relating to this event.

Compliance

17. Workplace health and safety is not just about compliance with every letter of the law. It is making sure our basic proposition about workplace health and safety is cemented in our organisation's culture. To this end, several compliance initiatives are under way with health and wellbeing a key focus. Unfortunately, a number have been cancelled due to Cyclone Gabrielle.

18. Gisborne District Council plays a key role in the local Te Tairāwhiti Asbestos Liaison Protocols where Council, Te Whata Ora, Fire & Emergency New Zealand and WorkSafe jointly support the reduction of occupational and public health risks associated with the exposure to asbestos.

19. To ensure all elected members fulfil due diligence in their capacity as an officer, health and safety reports to the Audit & Risk Committee will also be included in the subsequent Council agenda. The updates to the Governance Structure and Terms of Reference (**Report 20-219**) will mean that such information in the future will be accompanied by any recommendations from the Audit & Risk Committee.

20. Part of the role of an Officer of a PCBU [1] is to ensure that there is a safe workplace and that Council has the required resources available. We achieve this in several ways:
    a) COR (including the Chief Executive) meet weekly and discuss health and safety. Regular reviews of health and safety risks are undertaken – including general data, trends, accident data, critical risks and changes to guidance, standard operating procedures and health and safety Information.
    b) The Chief Executive and COR ensure sufficient finance is made available as and when required.
    c) Directors attend Health and Safety Committee meetings.
21. Gisborne's branch of NZISM (New Zealand Institute of Safety Management) continues to promote safety in Tairāwhiti.

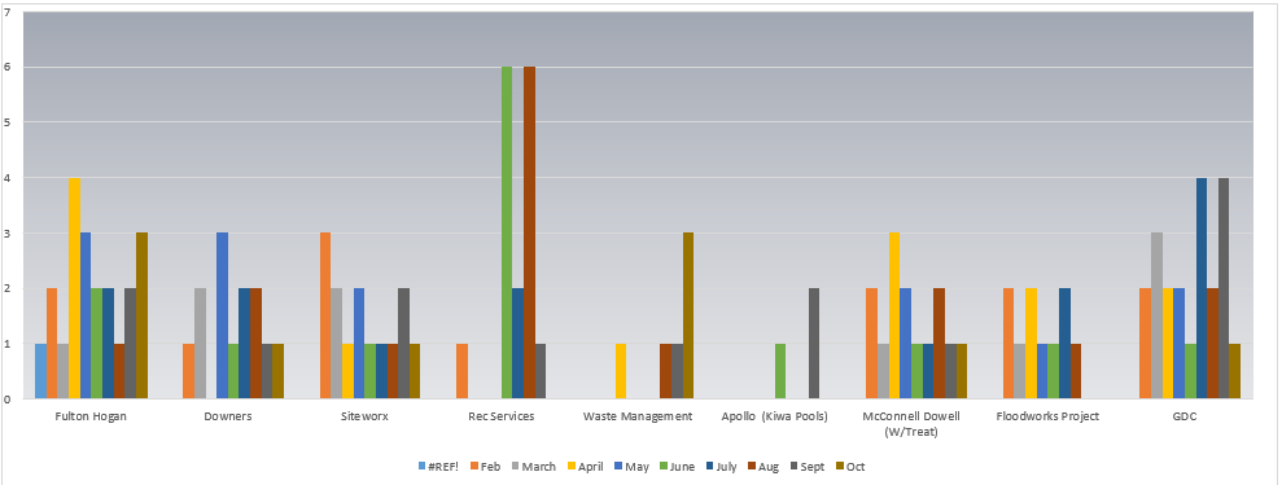
Contractor Management

22. A significant number of contractors are engaged in Council work, many on short duration contracts. This means obtaining accurate and timely data from the contractors is challenging. The main contractors have regular meetings with their Council counterparts where health and safety is the first item on the agenda. Incidents, accidents and near misses are reviewed and any recommendations arising from investigations shared.
23. Working closely with approved contractors includes regular meetings where health and safety is reviewed, including accident and incident data. Additional contractor near miss reporting is monitored to evaluate trends and comparisons with reported injury rates (**Table 1**) The benefit of collaboration not only ensures that Council complies with requirements under Section 34 of HSWA (overlapping duties) but also achieves benefits when exchanging learnings. Recent contractor event investigations have provided the opportunity to share learnings within Council teams. There is an increased emphasis on assurance and verification, regular reviews, site audits and investigation reviews.
24. Woody Debris removal from Waikanae beach has been initiated by Forestry PCBU's Ernslaw One and Aratu who have engaged Siteworx to complete the work. Under S.34 HSWA overlapping duties, Council have reviewed safety plans, beaches have been closed under CDEM S.88, signage is in place and Council personnel continue to regularly monitor the operations for safety.
25. Added internal health & safety resource will provide enhanced assurance and verification of key contractors within our community lifelines hub.

Near Miss reporting - Tier 1 Contractors

Last 6 Months

	2022 Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Total
Fulton Hogan	2	1	4	3	2	2	1	2	3	2	3	2	27
Downers	1	2	0	3	1	2	2	1	1	1	2	1	17
Siteworx	3	2	1	2	1	1	1	2	1	1	2	0	17
Rec Services	1	0	0	0	6	2	6	1	0	2	1	0	19
Waste Management	0	0	1	0	0	0	1	1	3	3	0	1	10
Apollo (Kiwa Pools)	0	0	0	0	1	0	0	2	0	1	2	1	7
McConnell Dowell (W/Treat)	2	1	3	2	1	1	2	1	1	1	0	0	15
Floodworks Project	2	1	2	1	1	2	1	0	0	0	1	0	11
GDC	2	3	2	2	1	4	2	4	1	2	6	2	31



Keep Up-to-date with Health and Safety Matters

26. Due diligence includes taking reasonable steps to acquire, and keep up to date with, knowledge of work health and safety matters Section 44(4)(a) of HSWA.

Whakaari/White Island update

27. WorkSafe laid charges against 13 parties, three of which were under HSWA Section 44: "Officers Duties". The next hearing is set for July 2023; the outcome will likely lead to an increased interest and awareness around Officer Duties under Section 44 of HSWA.

Other

28. Inspired Enterprises Limited (trading as Harrisons Carpet and Flooring Christchurch West) was sentenced at the Christchurch District Court on 16 February 2023. A fine of $52,500 was imposed where uncovered old vinyl backing was disturbed during removal, then disposed of it in an unsafe way. Testing of the broken vinyl later returned a positive result for chrysotile asbestos. Buildings constructed or renovated before 2000 are likely to contain asbestos materials.

29. ***Asbestos***: When homes and other buildings containing asbestos are damaged during floods, the asbestos-containing materials can become eroded, disturbed, broken, or friable. This can cause a health risk to homeowners, property owners, property managers, and the community. When damaged asbestos-containing materials are wet, they are not as dangerous, but once dry they can cause a risk to health if fibres are released that can become airborne and be inhaled (refer section 17).

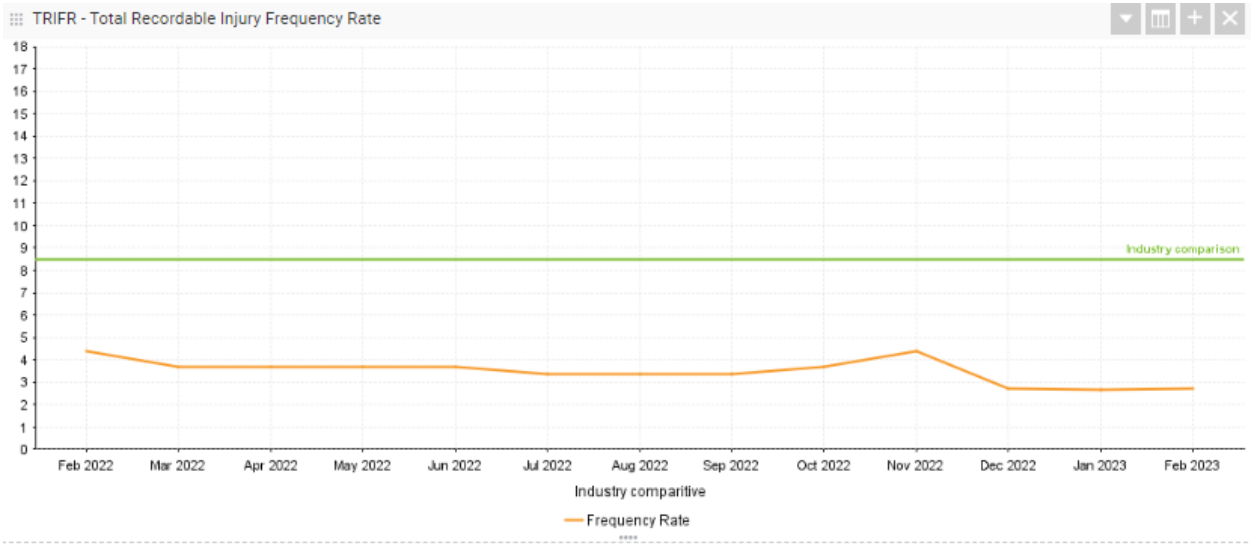
30. A Bay of Plenty business with an undocumented and ineffective health and safety process has been sentenced after a raised skip bin fell on a worker and inflicted a severe brain injury. Robin Phillip Horne and Lorraine Joy Ruth Horne, in partnership, trading as Bin Boys Bay of Plenty were fined $250,000 and reparations of $100,000.

Our Key Processes

- Facilitation of the **Employee Participation or WEPR** (worker engagement, participation and representation) process in line with HSWA regulations.
- Management of the VAULT/Damstra software which aligns with AS/NZ4801 Occupational Health and Safety Management systems and provides a repository for all health and safety information, hazard registers, risk registers, compliance registers and monitors improvement actions and investigations.
- Leading the Health and Safety Risk Management process which is a core function of the VAULT/Damstra system. The risk module has a sophisticated structure that fully integrates with all outputs of VAULT where risk assessments and controls are monitored and continually improved.
- Contribute to the **BOPLASS Mahi Tahi Local Government Collaboration Portal** which provides a shared resource where Council health and safety policy, guidance and related material is freely available, and members meet on a quarterly basis.
- Coordinate the **Audit and Review Process** from within VAULT/Damstra software. Scheduling and improvement actions are applied to individuals and monitored until close-out/completion.

Process Gaps or Improvement Opportunities

31. Improvement opportunities identified include:
    - Some aspects of VAULT/Damstra remain not well understood or utilised. Additional training is ongoing, targeting managers, team leaders and their teams.
    - Encouraging staff and contractors to ensure prompt reporting of events that include near misses.
    - Health and wellbeing initiatives require further development and implementation.
    - Managers/Team Leaders regularly engage with those working from home to support wellbeing and workstation set up.
    - Audit and review of major contractors is ongoing and requires further enhancement.
    - Accountability – annual health and safety KPIs assessment and review requires completion following year-end.



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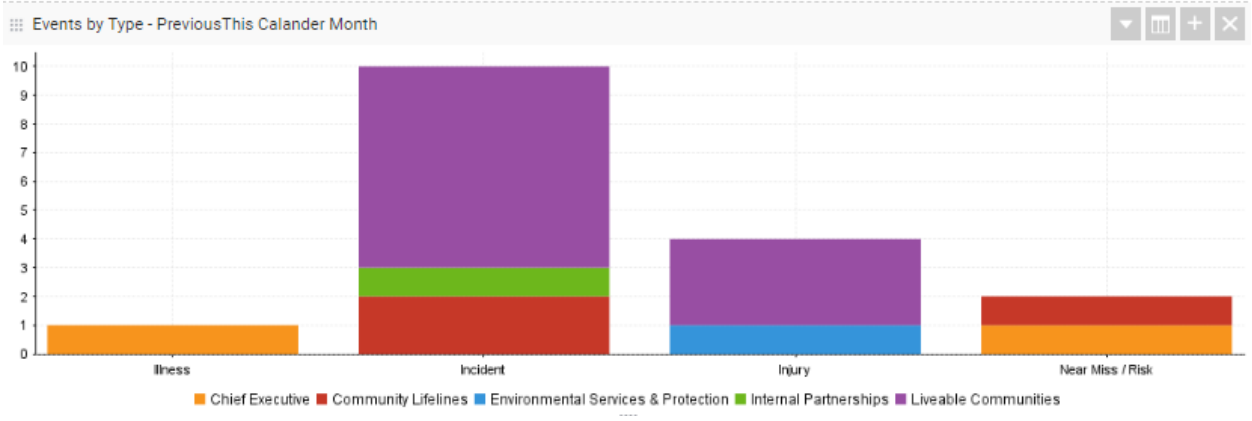

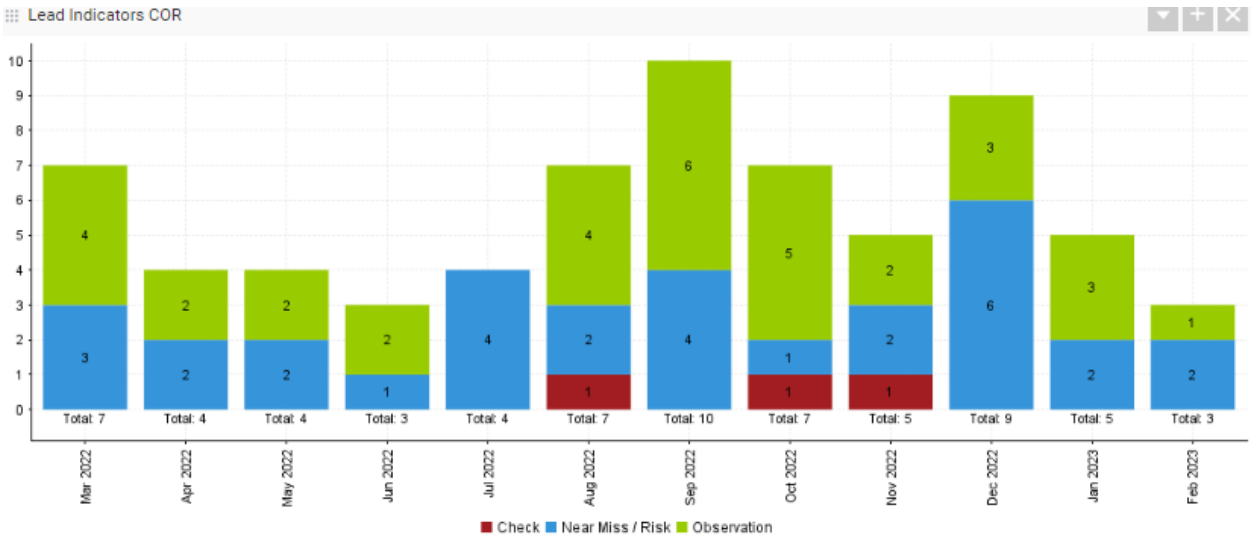

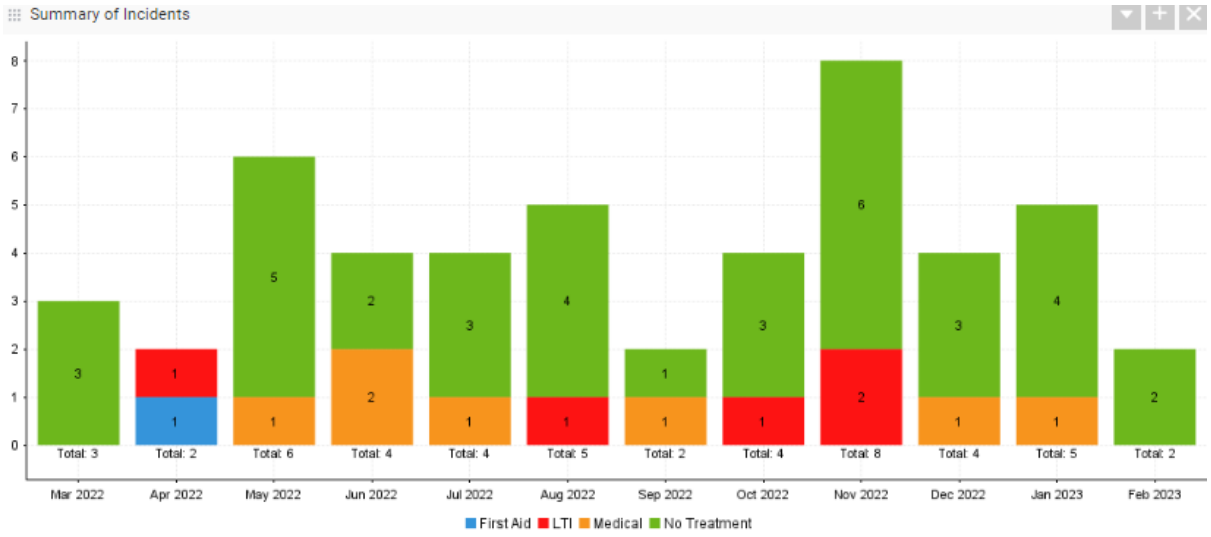

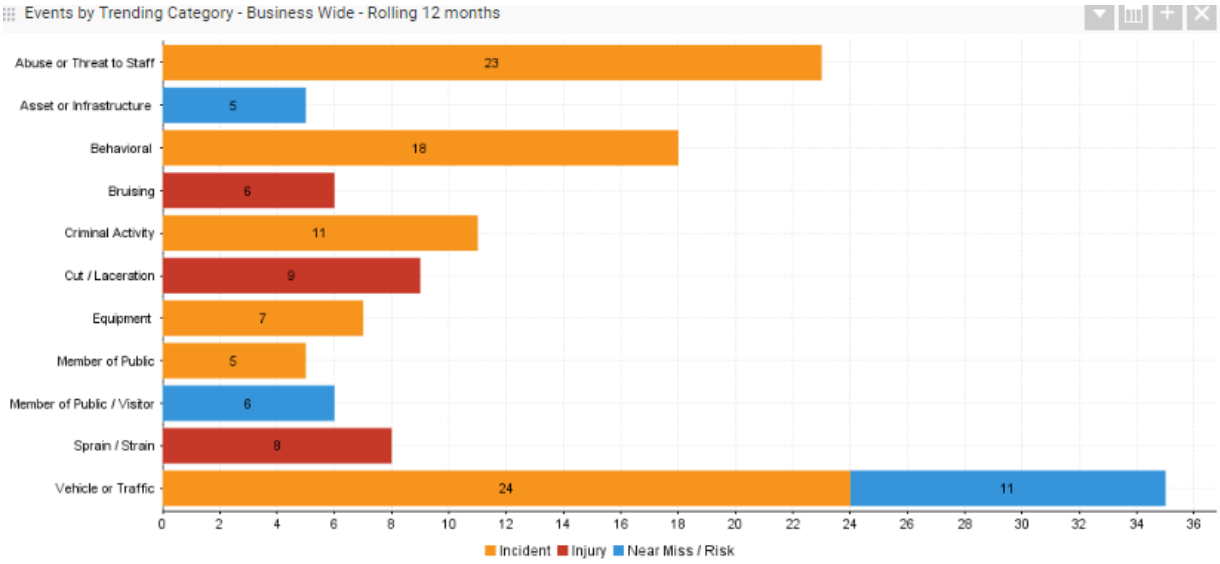

Incident	Fav	Adverse
Abuse or threat to staff	< 16	-
Behavioral	-	-
Contractor & Contractor Management	-	-
Member of public/Visitor	< 2	-
Slips,Trips & Falls	< 6	-
Bruising	< 3	-
Vehicle or traffic	-	> 10
Criminal Activity	-	> 4
Sprain/Strain	-	> 2
Cut/Laceration	-	> 1
Variance from last report (Sept)		

- Increase in reported Vehicle incidents.
- Decrease in reported Abuse to staff

Key/Explanation

- **Total Recordable Injury Frequency Rate (TRIFR):** Shows our performance gauged against similar organisations. It is an industry standard reporting calculation based on (recorded incidents × 200,000) ÷ total number of hours worked.
- Events by trend (last 12 months) highlight top three events as: vehicle and driving, conflict and aggression and an increase in criminal damage & behavioural incidents across Council facilities noting an increase within our Olympic Pool.

Notifiable events:

- In the past 12 months no Council staff have been involved in events requiring notification to WorkSafe.
- Four notifiable events, all incurred by contractors, requiring notification to WorkSafe:
  - Fulton Hogan – overhead wires struck by digger, no injuries. July 2022
  - Farmcare Ltd contractors involved in serious road traffic accident, Waingake. October 2022
  - Inline subcontracting to Fulton Hogan – Worker fell from truck entangled with machinery leading to finger amputation and surgery. November 2022
  - Worker from Pro Traffic Ltd, engaged by Fulton Hogan, fell and broke arm. December 2022

Note: 25 January 2023's tragic accident involving an 11 year old on Waikanae Beach has been referred to the Coroner. The accident was not regarded as being on a worksite under HSWA legislation.

ASSESSMENT of SIGNIFICANCE - AROTAKENGA o NGĀ HIRANGA

Impacts on Council's delivery of its Financial Strategy and Long Term Plan
Overall Process: **Low** Significance
This Report: **Low** Significance

Inconsistency with Council's current strategy and policy
Overall Process: **Low** Significance
This Report: **Low** Significance

The effects on all or a large part of the Gisborne district
Overall Process: **Low** Significance
This Report: **Low** Significance

The effects on individuals or specific communities
Overall Process: **Low** Significance
This Report: **Low** Significance

The level or history of public interest in the matter or issue
Overall Process: **Low** Significance
This Report: **Low** Significance

32. The decisions or matters in this report are considered Low significance in accordance with Council's Significance and Engagement Policy.

TANGATA WHENUA/MĀORI ENGAGEMENT - TŪTAKITANGA TANGATA WHENUA

33. While no tangata whenua engagement was required to complete this report, we are respectful when partnering with our community and organisations and ensure Te Tiriti o Waitangi – The Treaty of Waitangi is recognised in our daily work.

34. The HomeSafe team actively promote the principles of Te Tiriti o Waitangi – The Treaty of Waitangi.

COMMUNITY ENGAGEMENT

35. No community engagement was required to complete this report. All teams – including HomeSafe – are responsible for the safety and wellbeing of our workers and community. Contractor management and requests for service from our community may require input and guidance from the HomeSafe team.

CLIMATE CHANGE – Impacts / Implications

36. There are no impacts or implications on climate change, however we require regular re-evaluation of risks from the impact of increased extreme weather events.

CONSIDERATIONS - HEI WHAKAARO

Financial/Budget

37. Any financial implications relating to this report will be met from within existing budgets.

Legal

38. HSWA and associated regulations were introduced in 2016 and have now embedded. Significant fines have been highlighted in the media for PCBUs[1] who have not taken all reasonably practicable steps to mitigate health and safety risks. Any notifiable events have the potential to be investigated by the Government regulator (WorkSafe).

POLICY and PLANNING IMPLICATIONS - KAUPAPA HERE me ngā RITENGA WHAKAMAHERE

39. There are no policy and planning implications to consider. Health and safety are inherent in all areas of Council work.

RISKS - NGĀ TŪRARU

40. HSWA and its associated regulations require a PCBU to take all reasonably practicable steps to ensure the safety of its workers and other persons. There remains a risk to workers, Council reputation and regulatory censure due to any unidentified or unknown risks or failure of workers to follow safe work procedures. Risks to Council workers' health and wellbeing have increased, compounded by COVID-19 and more recently significant weather events (Hale and Gabrielle). The majority of known critical risks identified continue to be well managed.

12. Public Excluded Business

RESOLUTION TO EXCLUDE THE PUBLIC

Section 48, LOCAL GOVERNMENT OFFICIAL INFORMATION and MEETINGS ACT 1987

That:

1. **The public be excluded from the following part of the proceedings of this meeting, namely:**

   Confirmation of Confidential Minutes

   Item 4.1 Confirmation of Confidential Minutes 23 November 2022

   PUBLIC EXCLUDED Business

   Item 12.1 23-63 Litigation Risk and Legal Issues

   Item 12.2 23-64 Strategic Risk Deep Dive

2. **This resolution is made in reliance on section 48(1)(a) of the Local Government Official Information & Meetings Act 1987 and the particular interest or interests protected by section 6 or section 7 of that Act which would be prejudiced by the holding of the whole of the relevant part of the proceedings of the meeting in public are as follows:**

Item 12.2	7(2)(f)	Maintain the effective conduct of public affairs through the protection of such members, officers, employees and persons from improper pressure or harassment.
Items 4.1 & 12.1	7(2)(g)	Maintain legal professional privilege.
Item 4.1	7(2)(i)	Enable any Council holding the information to carry on, without prejudice or disadvantage, negotiations (including commercial and industrial negotiations).