

2024 GREATER HOBART BUSHFIRE EXPOSURE REPORT

An Analysis of Bushfire Exposure across the Greater Hobart, offering insights to support local governments and communities in enhancing long-term preparedness



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About the Project

The 2024 Greater Hobart Bushfire Exposure Report constitutes an element of Geoneon's "Anticipate and Monitor the Impact of Bushfires in Greater Hobart" project. This project, which commenced in May 2022 and is set to end in May 2025, is part of the broader "Preparing Australian Communities – Local Stream" initiative, funded by the National Emergency Management Agency. It was originally focusing within the jurisdictions of Glenorchy, Hobart, and Kingborough, but now also include Brighton, Clarence, and Sorell—areas that are increasingly vulnerable to the augmented risks asso-

ciated with extended fire seasons and a significant uptick in extreme fire danger days, projected at 40%.

Through sophisticated semi-automated tools and a dedicated web platform, the project is delivering granular bushfire data, supporting bushfire risk mitigation. This initiative not only fortifies the preparedness of communities and local governments but also gives residents critical insights, fostering a culture of resilience and proactive response amidst the escalating threats of natural disasters.

About Geoneon

Geoneon is an innovative technology firm, leveraging AI to transform complex geospatial data into actionable climate

risk insights for built and natural asset managers from both private and public organisations.

FOREWORD

Harnessing Technology for Bushfire Preparedness in a Changing Climate

As climate change accelerates, so too does the frequency and intensity of natural hazards, particularly bushfires. Tasmania, known for its pristine landscapes and growing urban population, faces increasing threats from these events. The 2024 Greater Hobart Bushfire Exposure Index comes at a critical time, offering new insights into the vulnerability of our communities to bushfire exposure. This report builds upon the foundations laid by the 2022-23 Index and incorporates the latest geospatial and climate data to provide an even more accurate assessment.

At Geoneon, our mission is to leverage cutting-edge technology and geospatial expertise to enhance resilience against natural hazards. This report represents the result of collaboration with local councils, including Hobart, Kingborough, Clarence, Sorell, and Brighton, alongside funding and support from the National Emergency Management Agency (NEMA). Using advanced satellite imagery, artificial intelligence, and deep-learning algorithms, we have assessed over 94,000 buildings across 132 suburbs, categorising them according to



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their level of bushfire exposure.

Research has long shown the correlation between building destruction and proximity to vegetation and bushland (Chen and McAneney in 2004, and many others after them). This reality underscores the importance of robust data and consistent exposure assessments like the one presented in this report, to inform planning, mitigation, and emergency response strategies for the future.

The findings contained in this report are critical for informing local governments and communities about their exposure to bushfire threats. We hope it will serve as a valuable resource in Tasmania's long-term efforts to reduce risk and prepare for a changing climate.

METHODOLOGY

Understand the Index v2.0

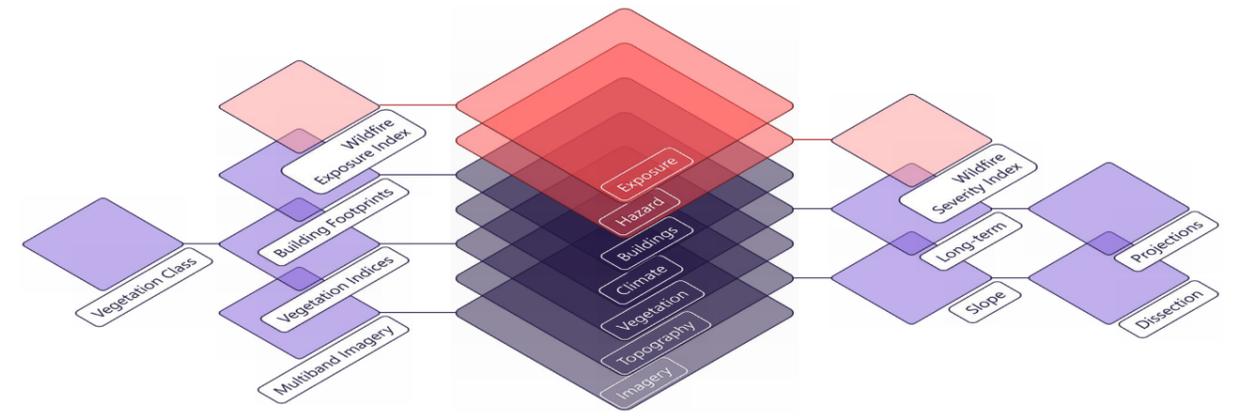


Figure 1: This diagram illustrates the input layers—buildings, climate, vegetation, topography, and imagery—used to generate the two key output layers: the Wildfire Severity Index and the Wildfire Exposure Index. These layers are combined to provide an assessment of building exposure across the Greater Hobart area.

The **Greater Hobart Bushfire Exposure Index** offers two essential layers that help visualise bushfire exposure in the region:

- **Wildfire Severity Index:** This layer represents a prediction of the potential severity of a bushfire in a given area. It considers critical factors like **vegetation type, density, topography** (e.g., slope of the land), and **climate** to estimate how severe a bushfire might become if it ignites. The **severity** layer is valuable for local governments to identify high-severity areas where bushfires are likely to be more intense, and it can inform fuel reduction and mitigation strategies.
- **Wildfire Exposure Index:** This layer focuses on the **potential exposure of buildings and communities to bushfires**, based primarily on their **proximity to bushland** and surrounding vegetation. The closer a building is to high-density vegetation or bushland, the higher the exposure. This index helps communities and authorities prioritise areas where homes and critical infrastructure are most exposed and plan safety measures accordingly.

Both of these indices—the **Wildfire Se-**

verity Index and the **Wildfire Exposure Index**—are derived from a framework called the **Geoneon Wildfire Data Stack**. This stack is built using a series of input layers that are essential to understanding and modelling bushfire severity. These layers include:

- **Buildings:** Residential, commercial, industrial, and infrastructure building footprints, which provide a clear understanding of where structures are located relative to bushland.
- **Climate:** Climate data, including historical precipitation patterns that can influence vegetation.
- **Vegetation:** Vegetation maps, showing the type and density of vegetation in the area, which is the primary fuel source for bushfires.
- **Topography:** Elevation and slope data, which are key for understanding severity.
- **Imagery:** High-resolution satellite imagery that provides a visual foundation for mapping and monitoring the area.

By combining these inputs, the **Geoneon Wildfire Data Stack** produces the two output layers—**Wildfire Severity** and

Wildfire Exposure—that provide a picture of bushfire exposure in the Greater

Hobart area.

Benefits and Applications of the Index

By providing precise geospatial data, the index enables local authorities to:

- **Prioritise Safety Measures:** Local governments can identify areas most exposed and develop targeted strategies to protect people and assets.
- **Optimise Resource Allocation:** The data helps authorities allocate resources efficiently to mitigate the impacts of bushfires, ensuring that funds and efforts are directed where they are most needed.

In addition to benefiting government agencies, the Greater Hobart Bushfire Exposure Index serves as a public resource, empowering residents with insights into their personal bushfire exposure. This information is essential for making informed decisions about preparedness strategies.

Key Benefits:

- **Strengthened Mitigation Strategies:** Improve overall hazard readiness by refining mitigation plans, reducing potential impacts, and enhancing emer-

gency response efforts.

- **Community Engagement & Communication:** Encourage risk awareness and foster collective action within communities, ensuring informed dialogue and engagement.
- **Sustainable Community Recovery:** Support long-term recovery by guiding communities in resilient and sustainable rebuilding efforts after bushfires.
- **New Resident Education:** Educate new homeowners and renters about their specific risks and preventive measures to ensure safety in bushfire-prone areas.
- **Resource Allocation & Prioritisation:** Maximise the efficiency of resource deployment by focusing on areas that present the highest exposure and potential risk.
- **Refined Risk Assessments:** Improve the accuracy and reliability of hazard evaluations by conducting more detailed and precise risk assessments.

RESULTS

Building Exposure to Bushfires in Greater Hobart

The 2024 Greater Hobart Bushfire Exposure Index assesses the exposure of over **94,000 buildings** across **132 suburbs** in the Greater Hobart area. This analysis provides valuable insights into the areas most exposed to bushfire. By identifying regions with the highest exposure, the index supports local governments and residents in prioritising preparedness,

mitigation, and emergency planning efforts.

This section presents the results in terms of both the number and percentage of buildings exposed, offering an overview of where bushfire exposure is most concentrated.

Exposure of Buildings

A total of **4.5%** of all assessed buildings are classified in the higher exposure categories, ranging from “Moderately High” to “Extremely High.” These buildings are at greater exposure due to their prox-

imity to bushland and other factors that influence bushfire severity, like vegetation density, topography, and long-term precipitation patterns.

Table 1: This table summarises the total number and percentage of buildings in the Greater Hobart area that fall into each exposure category (7-10), ranging from “Moderately High” to “Extremely High.”

| Bushfire Exposure Index | Number of Buildings | Percentage of Buildings |
|-------------------------|---------------------|-------------------------|
| Extremely High | 70 | 0.1% |
| Very High | 952 | 1.0% |
| Relatively High | 1,441 | 1.5% |
| Moderately High | 1,762 | 1.9% |
| Total | 4,225 | 4.5% |



Figure 2: This figure shows the distribution of buildings in an area of the Greater Hobart across the different exposure categories (1-10), providing a view of how exposure levels are distributed.

Council Breakdown

The analysis shows that Kingborough has the highest number of buildings in the higher exposure categories, followed by Hobart and Clarence. This data high-

lights the councils that face the greatest potential bushfire impact and where mitigation efforts should be prioritised.

Table 2: Breakdown of buildings exposed to bushfires by Local Government Area (LGA) and their Bushfire Exposure Index category.

| LGA | Number of Buildings | Percentage of Buildings |
|--------------|---------------------|-------------------------|
| Kingborough | 1727 | 10.5% |
| Hobart | 1205 | 6.3% |
| Clarence | 751 | 3.1% |
| Glenorchy | 203 | 2.5% |
| Sorell | 202 | 1.9% |
| Brighton | 137 | 1.1% |
| Total | 4,225 | 4.5% |

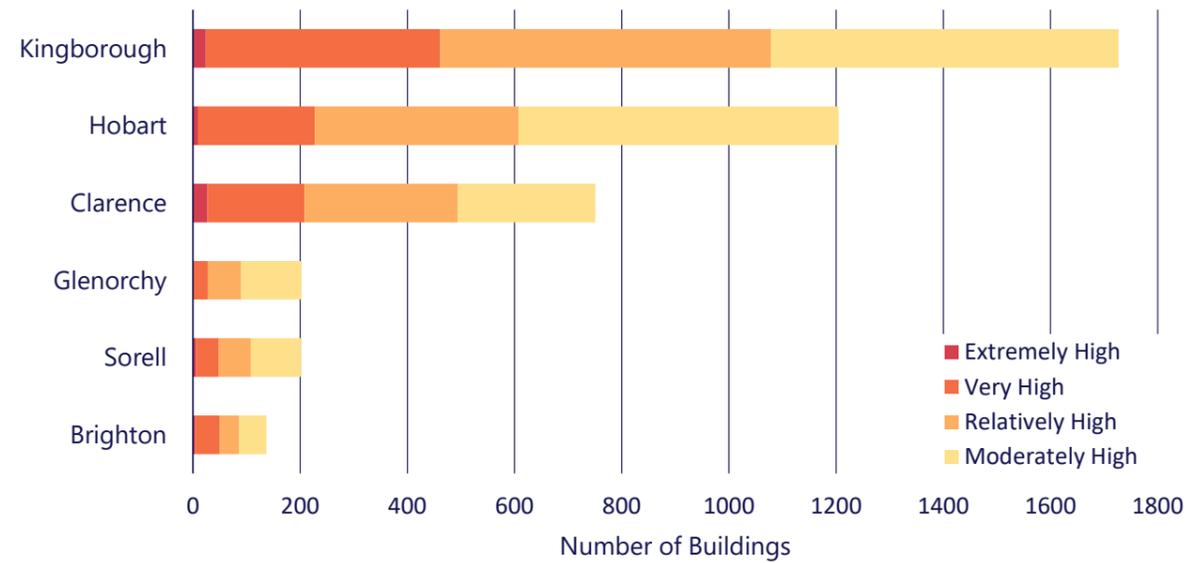


Figure 3: Number of buildings by Bushfire Exposure Index categories 7-10 by LGA in Greater Hobart.

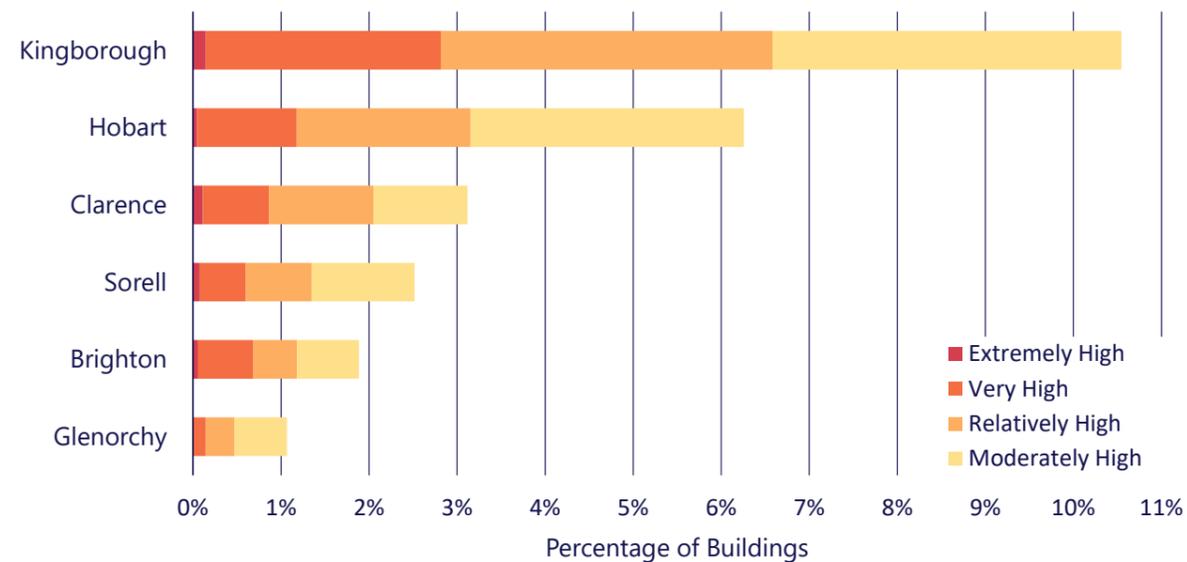


Figure 4: Percentage of buildings by Bushfire Exposure Index categories 7-10 by LGA in Greater Hobart.

Suburb-Level Insights

A closer look at individual suburbs reveals that areas such as Sandford (Clarence), Mount Nelson (Hobart), and Fern Tree (Hobart) have the highest number of buildings in the most exposed

categories. This information helps to understand which suburbs should be prioritised for bushfire mitigation efforts and emergency planning based on their exposure levels.

Table 3: Top 10 suburbs in Greater Hobart with the highest number of buildings exposed to bushfires (categories 7-10).

| Suburb | LGA | Number of Buildings |
|--------------|-------------|---------------------|
| Sandford | Clarence | 303 |
| Mount Nelson | Hobart | 292 |
| Fern Tree | Hobart | 267 |
| South Hobart | Hobart | 233 |
| Kingston | Kingborough | 182 |
| Margate | Kingborough | 158 |
| Bonnet Hill | Kingborough | 129 |
| Tolmans Hill | Hobart | 109 |
| Kettering | Kingborough | 107 |
| Oyster Cove | Kingborough | 99 |

Table 4: Suburbs with the highest percentage of buildings exposed to bushfires (categories 7-10).

| Suburb | LGA | Percentage of Buildings ¹ |
|--------------|-------------|--------------------------------------|
| Apollo Bay | Kingborough | 86% |
| Fern Tree | Hobart | 85% |
| Mount Rumney | Clarence | 73% |
| Bonnet Hill | Kingborough | 66% |
| Longley | Kingborough | 64% |
| Ridgeway | Hobart | 64% |
| Oyster Cove | Kingborough | 62% |
| South Bruny | Kingborough | 53% |
| Neika | Kingborough | 51% |
| Great Bay | Kingborough | 51% |

¹ Mount Wellington, while not listed as a suburb, has 77% of its buildings exposed to wildfire but was excluded from this table as it is not officially classified as a suburb.

Number and Percentage of Buildings Exposed

The analysis of the number of buildings exposed to bushfire reveals that some areas have a higher concentration of buildings in severe exposure categories. For instance, Kingborough has the highest number of exposed buildings, with 1,727 buildings falling into categories 7-10, followed by Hobart with 1,205 exposed buildings and Clarence with 751 exposed buildings.

At the suburb level, Sandford (Clarence) and Mount Nelson (Hobart) have the highest number of buildings exposed, highlighting the need for focused mitigation efforts in these regions.

In addition to the raw number of exposed buildings, it is also important to consider the percentage of buildings exposed within each suburb or council area. Notably, Fern Tree stands out in both met-

rics, with 85% of its buildings classified as exposed to bushfire, placing it second by percentage and third by number of exposed buildings (267). Bonnet Hill similarly ranks highly in both measures, with 66% of its buildings exposed, making it fourth by percentage and seventh by number of buildings (129). Meanwhile, Apollo Bay has the highest concentration, with 86% of its buildings exposed, despite having fewer buildings overall compared to other suburbs.

This percentage-based analysis provides local councils and communities with a clearer understanding of how concentrated the exposure is in certain areas, enabling targeted communication and preparedness strategies.

CONCLUSION

Enhancing Bushfire Preparedness through Data-Driven Insights

The 2024 Greater Hobart Bushfire Exposure Index provides a comprehensive assessment of the potential bushfire exposure of buildings across the Greater Hobart area. Tasmania, while known for its cooler climate, is increasingly vulnerable to bushfires, particularly in peri-urban areas where urban development meets bushland. With climate change leading to hotter, drier conditions, the frequency and intensity of bushfires in Tasmania are expected to rise, amplifying the need for improved bushfire risk management and preparedness strategies.

This report, based on advanced satellite data and geospatial analysis, assesses the bushfire exposure of over **94,000** buildings across **132** suburbs. The Bushfire Severity Index and Bushfire Exposure Index provide critical insights into areas where buildings face the greatest risk due to proximity to bushland and other factors.

The findings from this report show that

4.5% of all assessed buildings fall within the higher exposure categories (“Moderately High” to “Extremely High”), equating to **4,225 buildings** at significant exposure. Suburbs like **Fern Tree** and **Bonnet Hill** emerge as high-priority areas for targeted mitigation efforts, given both their large number of exposed buildings and the high percentage of exposure relative to total building stock. Fern Tree alone accounts for **267 buildings** exposed, representing **85%** of the suburb’s total buildings, making it one of the most exposed areas.

As Tasmania faces the growing threat of bushfires, tools like the Greater Hobart Bushfire Exposure Index are essential for guiding local governments and communities in preparing for future events. By focusing on high-exposure areas and implementing targeted mitigation strategies, the Greater Hobart can improve its resilience to bushfire impacts in a changing climate.

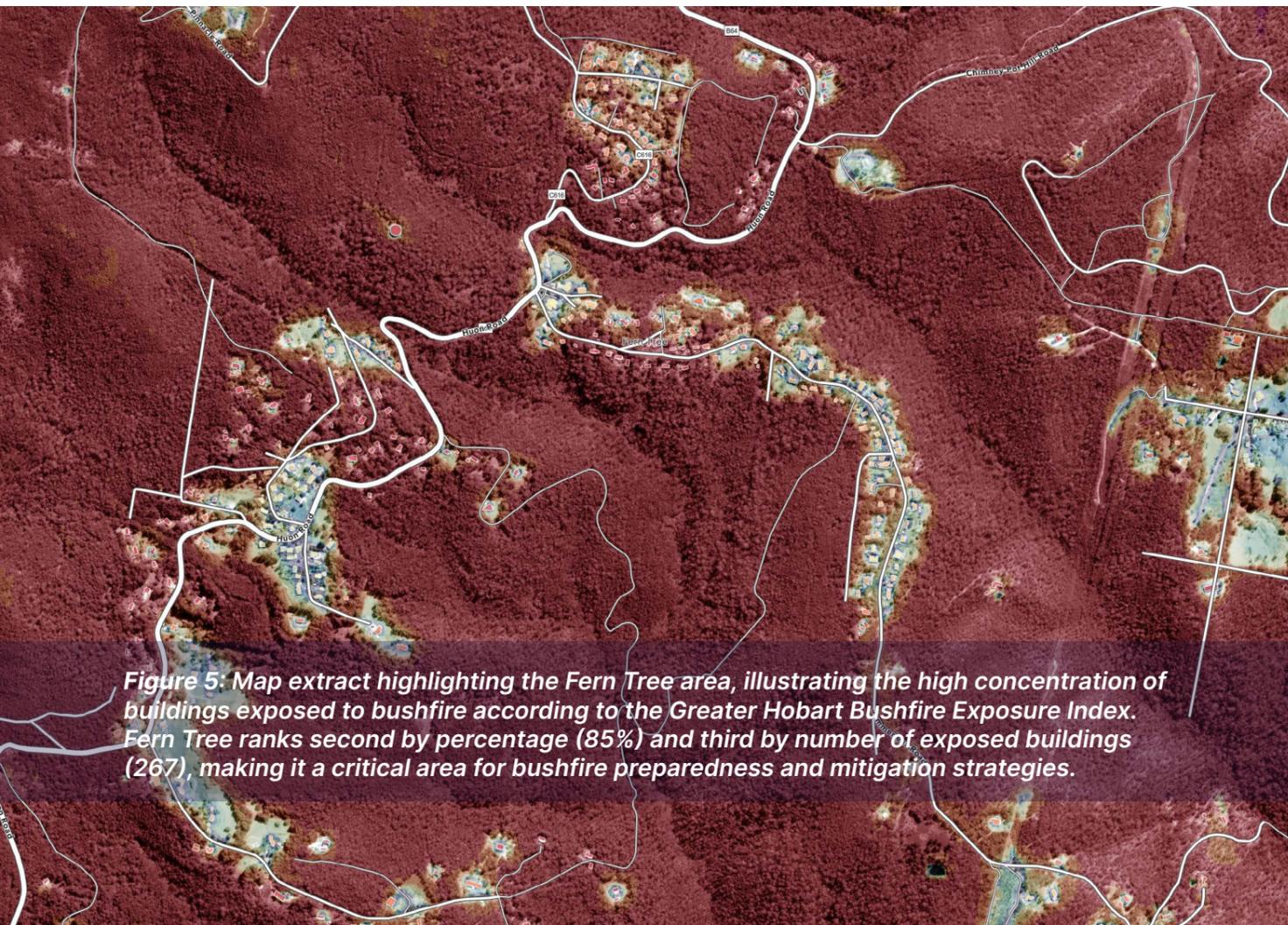


Figure 5: Map extract highlighting the Fern Tree area, illustrating the high concentration of buildings exposed to bushfire according to the Greater Hobart Bushfire Exposure Index. Fern Tree ranks second by percentage (85%) and third by number of exposed buildings (267), making it a critical area for bushfire preparedness and mitigation strategies.



About Geoneon

Geoneon is an innovative technology firm, leveraging Artificial Intelligence (AI) and Earth Observation to transform complex geospatial data into actionable climate risk insights for built and natural asset managers from both private and public organisations. Geoneon works across a diverse range of sectors, including utilities, insurances, cities, government agencies, and international organisations, reinforcing our ability to handle challenges of varying scales and complexities with proficiency.

About this document

This document provides only a general overview and is not intended as a comprehensive resource or to provide professional advice. Neither Geoneon nor any of its employees offers professional advice or services through this document. We recommend that you seek advice from a qualified professional before making any financial, business, or other decisions based on the information presented herein. Geoneon, along with its representatives, shall not be liable for any damages or losses experienced by any individual or entity who relies on the information contained in this document for any purpose.