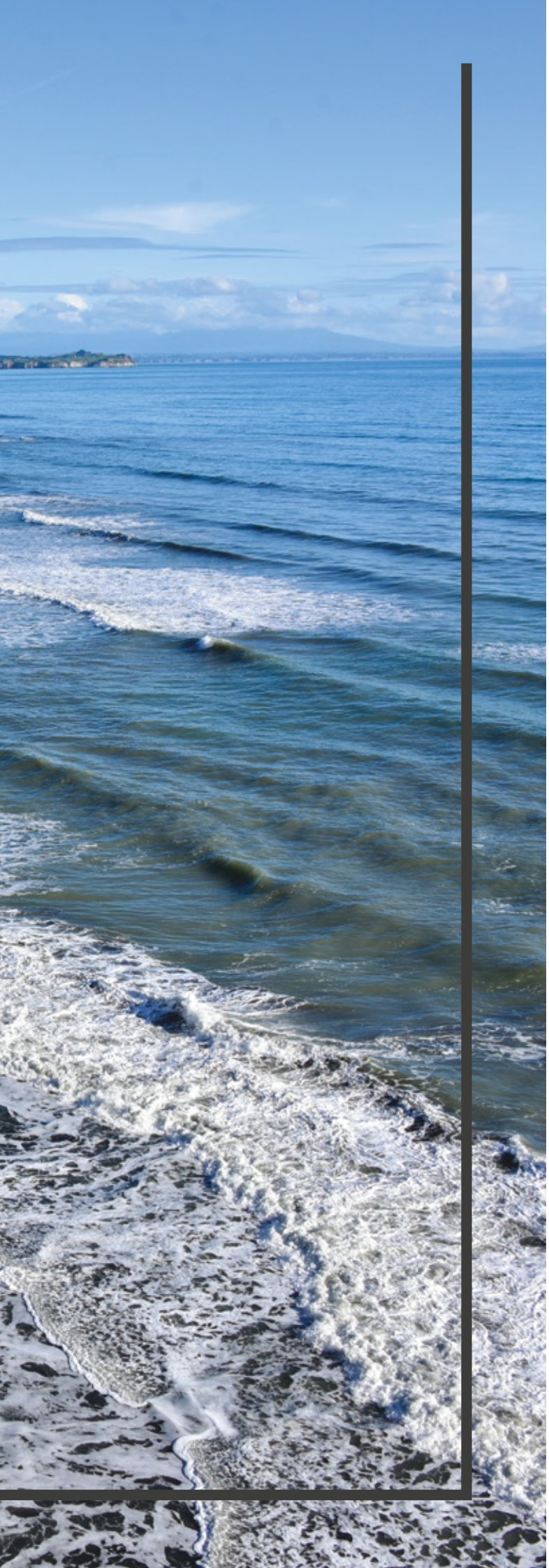
GNS SCIENCE

OUR HALF YEAR REPORT

31 DECEMBER 2019



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OUR NUMBERS

FRONT COVER
Air sampling, GNS Science National Isotope Centre

LEFT
View north from Tongaporutu cliffs, Taranaki coast

DIRECTORS' REPORT

The Board of GNS Science are pleased to report the organisation's performance and achievements in the July to December 2019 period. We continued to create and deliver globally influential science that contributes to a safer, cleaner, and more prosperous Aotearoa New Zealand for current and future generations.

A key focus of GNS Science's Strategic Review, which was completed at the end of the last financial year, was to review and refresh our science and organisational capability. This year we have been focussed on growing organisational capability to ensure that we can deliver on our organisational vision and outcomes. We are investing in building capability in leadership at all levels of the organisation through a Leadership Development Programme and have been progressing a number of initiatives such as the GNS Women in Leadership Forum,a Diversity and Inclusion Stocktake, and the development of GNS Organisational Values. The organisational values centre on 'manaakitanga' – recognising that it is through our interactions and partnerships with each other and our clients, stakeholders and customers that we will deliver fit-for-purpose science for New Zealand and the wider science community.

VISION MĀTAURANGA

In August 2019 we launched GNS Science's inaugural Ahunuku Māori Scholarship Programme in partnership with Victoria University of Wellington, inviting tertiary students of Māori descent to spend a summer working with our world-leading experts. Two Ahunuku Scholarship students (Māori students) and four Māori interns working as research assistants were welcomed this summer to work on projects: five students from Victoria University of Wellington, and one from the University of Waikato. Through the guidance and support of our GNS Science researchers, we are providing the opportunity for these students to gain valuable experience. The scholarships and internships will build stronger connections between GNS Science and the academic community and increase the talent pool for future recruitment of scientists, enhancing the Māori capacity and capability in GNS Science.

GNS Science was recently awarded an Unlocking Curious Minds grant *Discover Hidden Worlds: GeoCamp Northland, an Earth science noho marae*. This is a marae-based programme aiming to enthuse intermediate school-aged children (years 6-8) from remote communities about Earth science. It aims to show participating tamariki and their whānau that science is something they can understand, enjoy and participate in. This project will include three week-long GeoCamps at three remote marae across the far north of Tai Tokerau. Our curriculum creates learning experiences focussed on the local environments and issues of the marae area.

WHAKAARI/WHITE ISLAND

Responding to the eruption on Whakaari/White Island dominated our work towards the end of the year. Our thoughts are with the families and friends of those who have died and those who were injured.

GNS Science worked to support the all-of-government response to the eruption, which was coordinated by NEMA (National Emergency Management Agency). Our role was to provide science-based information and analysis to decision makers in support of the response and recovery operation. We provided information and updates to ministers, ministries, police and other emergency services, as well as communicating directly with the community.

In addition to our role of keeping responders, police and government up to date with the volcanic activity on Whakaari/White Island, there were also hundreds of interview requests from local and international media. This included radio and TV reports, monitoring the cameras and seismographs on the island throughout the event, providing up-to-the-minute data when the recovery team was on the island, and the production of Volcanic Alert Bulletins and updates. We are supporting two investigations being undertaken in relation to the Whakaari/White Island eruption: one by police on behalf of the coroner and the other by WorkSafe.

LEFT
Hapuku River landslide dam, Kaikōura

RECOGNITION OF OUR SCIENTISTS AND OUR RESEARCH

SCIENCE NEW ZEALAND NATIONAL AWARDS

GNS Science's It's Our Fault team won the Supreme Award at the 2019 Science New Zealand National Awards. The results of this team's work, researching the likelihood and impacts of large earthquakes in the Wellington region, are being used in decision-making and policy-making at local and regional government levels to support the region's earthquake resilience. The Supreme Award is a new award introduced this year and chosen from the 21 category winners across the seven Crown Research Institutes.

We also had three category winners that recognise outstanding science that benefits New Zealand. They were Paul White (Lifetime Achievement Award), Dr Sally Potter (Early Career Researcher Award), and the It's Our Fault programme (Team Award).

FELLOWS OF THE ROYAL SOCIETY TE APĀRANGI

Dr Kelvin Berryman and Dr James Crampton were named Fellows of the Royal Society Te Apārangi. Kelvin was recognised for his outstanding contribution to advancing the understanding of the processes and hazards associated with plate boundary zones. James, who is also a Professor at Victoria University of Wellington, is internationally recognised for his work on the physical drivers of evolution, and the dynamics of biodiversity, biogeography and biostratigraphy.

GEOSCIENCE AWARDS

A number of our researchers were recognised for their contributions to geosciences at the 2019 Geosciences Conference in November:

- Dr Nick Mortimer was awarded Honorary Life Membership of the Geoscience Society of New Zealand, the ninth such recipient and the youngest of this exclusive club.
- Dr Emily Warren-Smith received the 2019 New Zealand Geophysics Prize for a recent multi-author geophysics paper, *Episodic stress and fluid pressure cycling in subducting oceanic crust during slow slip*. Along with co-authors, Dr Bill Fry et al, this prize recognises the authors of the most meritorious publication in the field of geophysics in the current or previous two calendar years.
- Neville Palmer won the 2019 Kingma Award. The award is made to the outstanding New Zealand Earth science technician of that year and recognises a notable contribution to the work of their institution/field team.
- Dr Phaedra Upton was awarded the 2020 Hochstetter Lecturer. The Hochstetter Lecturer is awarded by the Geoscience Society of New Zealand to an Earth scientist who is undertaking, or who has recently completed, a major and as yet unpublished study, and who has a reputation as a good speaker. Phaedra is only the third woman in the 50-year history of this award to be selected.

COMMUNICATION AWARDS

Julian Thomson won the Science Communicators Association of New Zealand (SCANZ) Excellence in Science Communication Award for his work in developing and championing the GeoTrips website. The GeoTrips website aims to enable people of all backgrounds and abilities to visit interesting rock outcrops, geological displays or landforms in Aotearoa, as well as make their own geological explorations and discoveries. The award is offered biennially by SCANZ to recognise outstanding communication of science to a non-scientific audience.

The NZ Emergency Media and Public Affairs Award for Excellence in Emergency Communication Research went to a team of social scientists, including Dr Sally Potter from GNS Science. The team investigated the aftershock information needs, uses and responses of agencies and the public following the Canterbury earthquakes. Their findings have influenced the way GeoNet and United States Geological Survey (USGS) communicate earthquake forecasts and science advice in large earthquakes.

GEOTHERMAL ASSOCIATION AWARD

Dr Isabelle Chambefort was awarded the 2019 New Zealand Geothermal Association Contribution Award. This acknowledges that in the past eight years Isabelle has received almost $12m in funding from one Fast-Start Marsden, one Full Marsden and one Endeavour Research Programme grant. All these grants are dedicated to better understanding the deep source of the geothermal systems and their connection with the magmatic system, to better constrain the future use of New Zealand's supercritical resources.

EXCELLENCE IN VISION MĀTAURANGA RESEARCH

Paul White, his team, and Ngāti Rangiwewehi secured Gold status for their Vision Mātauranga Capability Fund project: Kaitiaki flows and baseflow-dominated stream systems. GNS Science has partnered with Ngāti Rangiwewehi to develop a new approach to water resource management. Ngāti Rangiwewehi are kaitiaki (guardians) of the Awahou stream, and Paul's team has worked closely with them on flow regimes that meet the iwi's needs around food-gathering, sustainability and their economic and spiritual wellbeing. The project is sharing its findings and engaging in outreach with other iwi. The Ministry of Business, Innovation and Employment would like to use this project as an exemplar to create communications material to raise the awareness of the fund with Māori organisations looking for opportunities to increase their science capability and capacity.

UNITED NATIONS GLOBAL RISK ASSESSMENT

Dr Kelvin Berryman was re-appointed to the Advisory Board of the United Nations Office for Disaster Risk Reduction (UNDRR) for the biennial Global Risk Assessment Report.

FINANCIAL PERFORMANCE

GNS Science has recorded a net profit after tax of $0.1m for the six months ended 31 December 2019, a reduction of $0.6m on the same period last year. The reduction is largely revenue related as total revenue has decreased by $1m to $46m, due to a fall in commercial income.

Employee benefit expenses have increased by $0.6m, as 2019 is the first half year with the full salaries of staff employed for the National Geohazards Monitoring Centre, which opened in November 2018. In addition, headcount has been increasing, due to the new organisation structure which took effect from 1 April 2019. Total operating expenses are down between periods by $0.4m, reflecting lower research subcontract costs to date, as well as one-time costs in the first half of 2018/19, relating to a significant science project.

ABOVE
Science staff with Minister of Science and Innovation Hon Dr Megan Woods at New Zealand Science Awards, Wellington in November 2019

OUR SCIENCE

NATURAL HAZARDS AND RISKS

CLOSING OF THE NATURAL HAZARDS RESEARCH PLATFORM

The Natural Hazards Research Platform's work ended on 31 October 2019. The Platform was a programme of work established in 2009 by the New Zealand Government to provide long-term funding for natural hazard research, and to help researchers and end-users work more closely together. It has provided important support to New Zealand's response and recovery to major events through the past decade. The Platform has been led by GNS Science, with NIWA as a co-anchor organisation, Opus Research, and the universities of Canterbury, Massey and Auckland as partners. The Resilience to Nature's Challenges National Science Challenge will continue the good work done under the Platform to enhance New Zealand's ability to anticipate, adapt and thrive in the face of ever-changing natural hazards.

WELLINGTON RESILIENCE PROGRAMME

The final report for a major project, the Wellington Resilience Programme business case, was released in December 2019 by the Wellington Lifelines Group, chaired by Dame Fran Wilde. The report calls for major investment in infrastructure to avoid crippling New Zealand's economy following a major earthquake in Wellington. Working with partners Market Economics and Resilient Organisations, GNS Science's risk and economic modelling results were central to the business case. RiskScape and MERIT software were used to model the region's resilience and subsequent economic disruption following a large earthquake.

ENHANCING TSUNAMI SAFETY

The establishment of the New Zealand DART Buoy Network is part of the Government's Emergency Management System Reform, which is a range of initiatives aimed at improving the emergency management system. We welcome investment from the Crown and the support for early warning systems, through which the culmination of many years of work by GNS Science and other collaborators resulted in the deployment of four DART buoys in December 2019.

These buoys will be key in enhancing the safety of New Zealanders and our South Pacific neighbours from the impacts of a tsunami. They fill the void between natural warning and a threat being detected on coastal tsunami gauges. The design of the 12-buoy network was carried out by GNS Science. The project demonstrates how science translates into practise and government agencies (NEMA, GNS Science, NIWA, MFAT, MBIE) working effectively together.

The National Geohazards Monitoring Centre will provide 24/7 eyes on monitoring the buoys. This means NEMA and Civil Defence will get information far sooner, leading to earlier tsunami warnings and faster evacuations. In natural hazard events every second counts.

TSUNAMI EARTHQUAKES – AN UNDERRATED HAZARD

Dr Dan Bassett recently won a Marsden Fund grant to study the tsunami earthquake hazard to greatly improve assessments of the hazard globally. Tsunami earthquakes are shallow, long duration earthquakes at subduction zones that generate disproportionately large tsunami relative to earthquake magnitude. Such earthquakes pose a large hazard to coastal populations, as the ground shaking is typically not sufficient to prompt self-evacuation prior to the arrival of the tsunami.

LEFT
Coastal uplift caused by the 2016 Kaikōura Earthquake

ENVIRONMENT AND CLIMATE

DID THE WEST ANTARCTIC ICE SHEET COLLAPSE DURING THE LAST INTERGLACIAL WARM PERIOD?

We have been awarded a Marsden Fund grant to study the Antarctic ice to determine whether the West Antarctic Ice Sheet collapsed during the last interglacial warm period. The research will be led by GNS Science Principal Scientist Dr Nancy Bertler and will allow us to critically assess and improve future projections on how, when, and how quickly the West Antarctic Ice Sheet might collapse.

After receiving the Marsden Fund grant, Nancy gave a presentation on 'Stability of the Antarctic ice sheets – Implications for sea level rise' for the Marsden Fund 25 Series which is celebrating 25 years of excellent research. The audience included representatives from local government, ministries and the community.

GROUNDWATER RESEARCH

The New Zealand Groundwater Atlas Project was completed and provided to the Ministry for the Environment at the end of October. The project delivered 17 spatially attributed national groundwater-relevant GIS datasets and five reports. Medium-to-long-term use for this information includes national and inter-regional hydrogeological characterisation projects, and public engagement on New Zealand's groundwater resources.

GNS Science completed an Envirolink project with Hawkes Bay Regional Council and Bay of Plenty Regional Council Toi Moana on the use of an Unmanned Aerial Vehicle to acquire high-resolution groundwater recharge information. The project established proof-of-concept of the UAV technique, which has the potential to significantly improve knowledge of how rainfall recharge to groundwater systems varies spatially at the local and catchment scale. This information is important to regional councils as rainfall recharge is an important factor in the management of water resources.

LAKES380

Lakes380 is a project designed to obtain a nationwide overview of the health of 10% of our lakes to enable prioritisation of regions or lake types for protection. The knowledge from this project will be used to assess water quality, characterise biodiversity and inform and prioritise mitigation strategies, on a national scale.

This year, the Lakes380 team have been in Northland, Taranaki and South Canterbury, with the last Canterbury lake being the 150th lake to be cored since the start of the project. The Lakes380 team continue to develop new relationships and enhance existing partnerships. When sampling lakes throughout the country, our 'knowledge sharing days' held in each region provide a great opportunity to develop enduring relationships with mana whenua, regional councils, Department of Conservation and others. They also enable the team to gain a greater appreciation of the cultural significance and values associated with the lakes we sample.

This project involves working with multiple agencies and groups in a collaborative approach. It is co-led by GNS Science and the Cawthron Institute, and relies on strong research partnerships with Victoria University of Wellington, University of Otago and a number of other organisations and iwi collectives around the country.

ENERGY FUTURES

Our research supporting renewable geothermal power generation and a hydrogen economy is aimed at supporting New Zealand towards a low carbon and renewable energy-based economy.

GEOTHERMAL EXPERTISE

We were recently awarded an Endeavour Programme grant for the research project 'Geothermal: The next generation'. This research will be led by Dr Isabelle Chambefort and focuses on the potential of our deeper, supercritical geothermal resources.

We continue to provide geothermal geoscience consultancy for both New Zealand and international enterprises, including for Contact Energy, Top Energy and Mercury New Zealand in our domestic market; and Denergy Co. Ltd in Japan, plus a number of new entrants in the Japan market from Japan and Europe. We also continue to have long-running partnerships with Geothermal Energy Research & Development Co. Ltd in Japan and the Industrial Technology Research Institute of ROC Taiwan.

Dr John Burnell and Dr Andrew Rae were invited speakers at the 1st Philippine Geothermal Congress held in Manila in October 2019. The theme of the congress was 'Beyond Conventional: Tapping New Geothermal Frontiers'.

FIRST VOLTAGE GENERATED

Voltage was generated in December 2019 for the first time using a thin film catalyst produced by the Materials Science team. As part of research into new hydrogen technologies, the team achieved a key research milestone by producing electricity from a fuel cell using our own locally engineered materials. The team is now racing to fully characterise the performance of the material and start optimisation work. Combined with recent designs produced within GNS Science's workshops, the team is on track to demonstrate the industrial viability of this new technology.

To advance our efforts in the hydrogen field, we were awarded an Endeavour Smart Ideas grant for 'Nano-catalytic surfaces for efficient, stable fuel cells and eco-friendly hydrogen production'. This research will be led by Dr Jérôme Leveneur and aims to develop novel nano-catalytic surfaces that replace platinum in hydrogen production and fuel cells, to aid in New Zealand's transition to a low carbon economy.

THE FUTURE OF HYDROGEN

GNS Science hosted and led an inter-organisational workshop on 'The Future of Hydrogen Research in New Zealand'. Led by Dr John Kennedy, the participants were Callaghan Innovation, MacDiarmid Institute (VUW), University of Otago, Meridian Energy, Contact Energy, First Gas and the Hydrogen Association. The workshop addressed current research directions and research themes, including hydrogen production, transport and utilisation. It also looked at opportunities for future collaboration and funding avenues. The workshop was successful in helping to position GNS Science as a key hydrogen research player and future leader in New Zealand.

IN-ROAD WIRELESS CHARGING

GNS Science has successfully delivered new magnetic materials needed for use in a large multi-institutional project aiming to tackle several technological challenges to enable in-road wireless charging (inductive power). Led by the University of Auckland and including our partners at Victoria University of Wellington and CRL Energy Ltd, this programme aims to provide a key solution to increase uptake of electric vehicles by enabling them to charge while driving, thereby removing the range barrier.

LAND AND MARINE GEOSCIENCE

OUR CONTINUED RELATIONSHIP WITH AUSTRALIA

A collaboration framework agreement has been signed with Geoscience Australia. The aim of the agreement is to establish a framework for GNS Science and Geoscience Australia to develop a closer scientific relationship. It will be overseen by a management committee that will meet annually to track progress and ensure that we are maximising opportunities for both parties. Initial areas outlined include data management and data science, geological and geophysical mapping, organic geochemistry and isotope analysis, basin modelling, natural hazards and risk, changing environments and climates, groundwater, joint research within the International Ocean Discovery Program, and new energy technologies. This complements our reciprocal arrangement with Geoscience Australia for 24/7 earthquake monitoring and alert support, should a big event limit our systems and ability to communicate with authorities.

E TŪHURA – EXPLORE ZEALANDIA

GNS Science has developed a public web-based data discovery platform, E Tūhura – Explore Zealandia (TEZ) https://data.gns.cri.nz/tez/. It can be used for exploring Earth science research data collected on land and offshore in New Zealand's Exclusive Economic Zone. The continuously updated TEZ portal will allow researchers, collaborators and stakeholders to integrate different datasets as they are acquired.

DISCOVERY OF NEW MEGA-VOLCANO

A paper was published in the journal *Marine Geology* in early November 2019 on the discovery of a mega-volcano off the Philippines coast. Jenny Barretto and Ray Wood from GNS Science, and Dr John Milsom from Gladestry Associates (UK) made the discovery while conducting a study on the Philippines' continental shelf. If the team's conclusions are confirmed by further research, it will officially become the largest known caldera on Earth.

IWI PARTNERSHIPS FOR HOKIANGA HARBOUR WORK

A Vision Mātauranga Capability Fund project, 'Tātaihia te Parataiao o te Wahapū: Hokianga Sedimentation', aims to enhance connections between Te Rarawa Anga Mua and GNS Science through investigations of drivers of sedimentation in the Hokianga Harbour. A major component of the project will record stories from Te Rarawa about the Harbour and the changes they know or have seen in their lifetime. The principles of sediment coring were demonstrated to Te Rarawa by our researchers on the wharf. Key skills and knowledge will be transferred so Te Rarawa can direct future research efforts that expand our pilot work across the region.

RIGHT
Demonstrating the principles of sediment coring, Motukaraka wharf at Ngāi Tūpoto Marae, Hokianga Harbour

MAKING A GLOBAL CONTRIBUTION

INDONESIAN RESILIENCE WORK

The project team for Strengthened Indonesian Resilience: Reducing Risks from Disasters undertook a successful final visit to Indonesia, including five districts in Sumatra, Lombok Island and Sumbawa. This was to complete a range of community projects, undertake final evaluation of the districts, and track progress towards implementing action plans for Disaster Risk Reduction. The final Disaster Risk Reduction seminar held at Gadjah Mada University was positively received by the Ministry of Foreign Affairs and Trade and the Indonesian Government. It showcased the achievements made in the districts and provided an opportunity to discuss improvements needed and next steps.

STRENGTHENING JAPANESE RELATIONSHIPS

GNS Science is embarking on a new project with Japanese collaborators that will look at similarities between subduction zones in Japan and New Zealand to improve the understanding of the Hikurangi subduction zone along the East Coast of the North Island.

The Northeast Japan megathrust and the southern part of the Hikurangi subduction zone have similar structural characteristics. The new work will compare their properties to shed light on the types of earthquake that might be expected from the Hikurangi subduction fault in the future.

OTHER INTERNATIONAL CONNECTIONS

GNS Science hosted 30 senior disaster managers from 10 ASEAN (Association of South Eastern Asian Nations) member countries, including Indonesia, Thailand, Malaysia and the Philippines, as well as representatives from the Red Cross. Their visit to our National Geohazards Monitoring Centre was part of critical incident management leadership training. This is part of a five-year training course and is a flagship programme funded by the Ministry of Foreign Affairs and Trade.

We also hosted a Philippines delegation as part of a study visit organised by the World Bank and the Ministry of Business, Innovation and Employment. New Zealand's approach to public asset management and insurance is of interest to the Philippines, given our two nations share similar exposure in terms of hazard and risk.

GNS Science participated in a Te Puni Kōkiri Māori Trade Mission to Taiwan in late June last year. We are working with the Taiwanese and Te Puni Kōkiri's economic wealth policy team to progress opportunities on Indigenous Cooperation (Chapter 19) under the Economic Cooperation Agreement between New Zealand and Taiwan. The work programme is likely to focus on water and energy resources, and a Taiwan Taitung City Hall delegation will be visiting GNS Science in March to discuss geothermal opportunities, including how indigenous people might utilise geothermal resources.

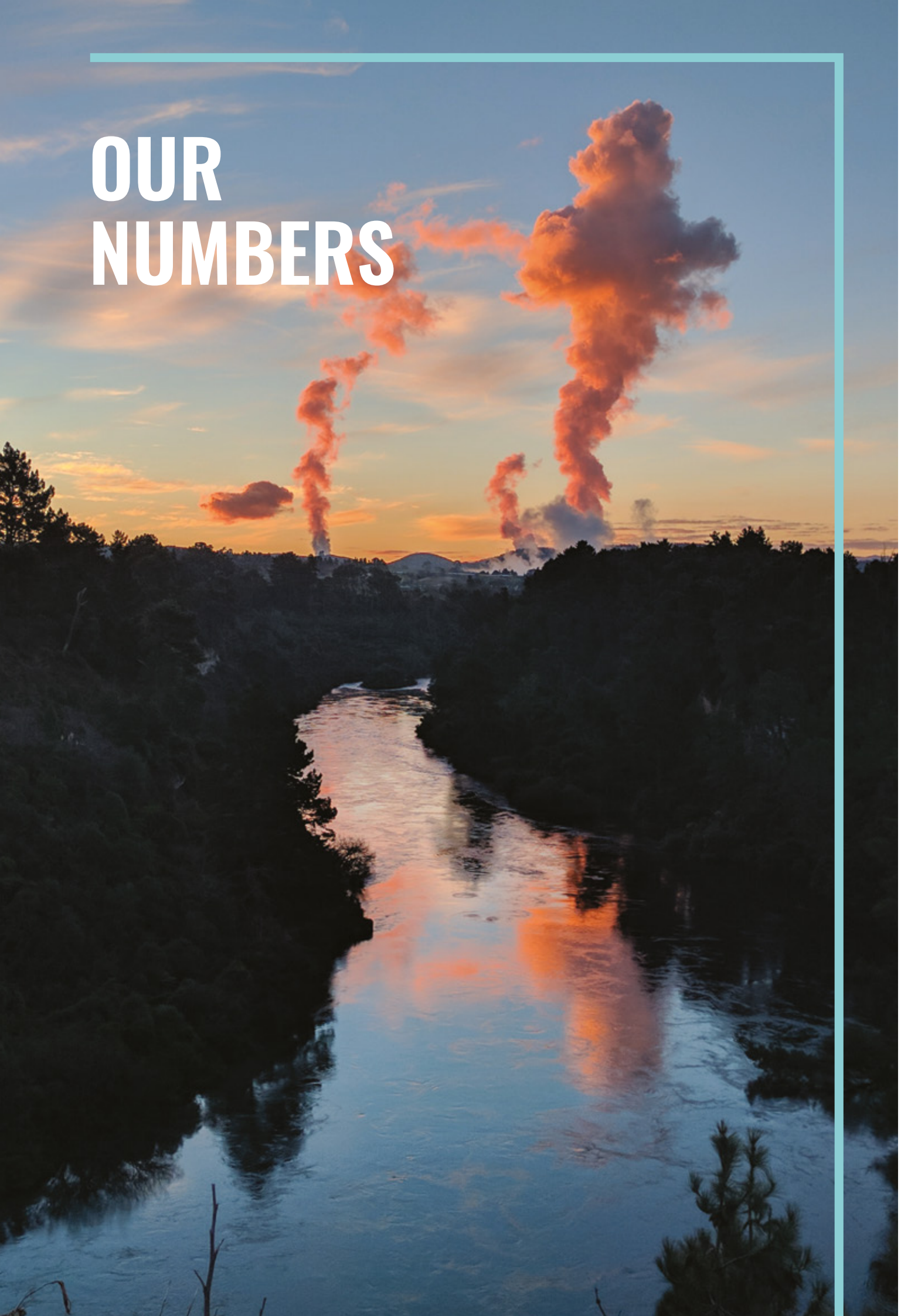
For and on behalf of the Board

Dr Nicola Crauford
Chairman GNS Science

ABOVE
Signing the collaboration framework agreement with Geoscience Australia in October 2019

RIGHT
Wairakei geothermal steam reflections in the Waikato River

OUR NUMBERS



FINANCIAL STATEMENTS

CONSOLIDATED STATEMENT OF COMPREHENSIVE INCOME

For the six months ended 31 December 2019

in thousands of New Zealand dollars	**Unaudited 6 Months Dec-19**	Unaudited 6 Months Dec-18	Audited 12 Months Jun-19
Revenue			
Research contracts	**32,836**	32,288	64,519
Commercial	**6,755**	8,566	18,213
GeoNet services	**6,379**	6,132	12,523
Other income	**40**	49	59
Total revenue	**46,010**	47,035	95,314
Operating expenses			
Employee benefit expense	**23,134**	22,574	45,730
Other operating expenses	**18,460**	19,260	39,484
GeoNet direct expenses	**1,826**	1,976	4,203
Total operating expenses	**43,420**	43,810	89,417
Profit before interest, tax, depreciation and amortisation	**2,590**	3,225	5,897
Depreciation	**2,440**	2,307	4,852
Amortisation	**212**	242	657
(Loss)/profit before interest and tax	**(62)**	676	388
Interest income	**201**	338	642
Interest expense	**–**	–	(4)
Profit before tax	**139**	1,014	1,026
Income tax	**(39)**	(285)	(571)
Net profit after tax	**100**	729	**455**
Other comprehensive income	**–**	–	–
Total comprehensive income attributable to owners	**100**	729	455

The accompanying notes form part of these financial statements.

CONSOLIDATED STATEMENT OF CHANGES IN EQUITY

For the six months ended 31 December 2019

in thousands of New Zealand dollars	Share Capital	Equity Reserves		Total Equity
		Retained Earnings	Cash Flow Hedge Reserve	
Balance at 1 July 2018	6,167	27,942	–	34,109
Profit after tax	–	729	–	729
Balance at 31 December 2018	**6,167**	**28,671**	**–**	**34,838**
Profit after tax	–	(274)	–	(274)
Balance at 30 June 2019	**6,167**	**28,397**	**–**	**34,564**
Profit after tax	–	100	–	100
Balance at 31 December 2019	**6,167**	**28,497**	**–**	**34,664**

The accompanying notes form part of these financial statements.

CONSOLIDATED BALANCE SHEET

As at 31 December 2019

in thousands of New Zealand dollars	**Unaudited Dec-19**	Unaudited Dec-18	Audited Jun-19
Equity			
Share capital	**6,167**	6,167	6,167
Retained earnings	**28,497**	28,671	28,397
Total equity	**34,664**	34,838	34,564
Represented by:			
Non-current assets			
Property, plant and equipment	**28,093**	27,213	27,211
Intangible assets	**488**	897	846
Investments	**30**	30	30
Total non-current assets	**28,611**	28,140	28,087
Current assets			
Cash and cash equivalents	**3,638**	2,321	10,132
Short-term investments	**11,073**	15,000	7,500
Trade receivables	**3,721**	5,463	7,131
Prepayments	**2,858**	2,421	2,122
Work in progress	**3,052**	3,312	3,439
Current tax	**4**	585	–
Deferred tax	**815**	239	815
Total current assets	**25,161**	29,341	31,139
Total assets	**53,772**	57,481	59,226
Non-current liabilities			
Non-current provisions	**710**	1,898	1,640
Total non-current liabilities	**710**	1,898	1,640
Current liabilities			
Trade and other payables	**5,067**	6,016	8,178
Current provisions	**3,558**	3,149	3,145
Revenue in advance	**9,773**	11,580	11,412
Provision for income tax	**–**	–	287
Total current liabilities	**18,398**	20,745	23,022
Total liabilities	**19,108**	22,643	24,662
Net assets	**34,664**	34,838	34,564

The accompanying notes form part of these financial statements.

For and on behalf of the Board

Dr Nicola Crauford
Chairman
19 February 2020

Sarah Haydon
Deputy Chairman
19 February 2020

CONSOLIDATED STATEMENT OF CASH FLOWS

For the six months ended 31 December 2019

in thousands of New Zealand dollars	Note	**Unaudited 6 Months Dec-19**	Unaudited 6 Months Dec-18	Audited 12 Months Jun-19
Cash flows from operating activities				
Cash was provided from:				
Receipts from customers		**48,050**	47,035	93,064
Interest received		**318**	338	567
		48,368	47,373	93,631
Cash was applied to:				
Payments to suppliers and employees		**(47,514)**	(48,809)	(92,531)
Interest paid		**–**	–	(4)
Income tax paid		**(330)**	(578)	(568)
		(47,844)	(49,387)	(93,103)
Net cash flows from operating activities	4	**524**	(2,014)	528
Cash flows from investing activities				
Cash was provided from:				
Sale of property, plant, equipment and intangible assets		**2**	–	3
Maturity of short-term investments		**4,500**	4,000	26,500
		4,502	4,000	26,503
Cash was applied to:				
Purchase of property, plant, equipment and intangible assets		**(3,447)**	(1,957)	(4,192)
Placement of short-term investments		**(8,073)**	–	(15,000)
		(11,520)	(1,957)	(19,192)
Net cash flows from investing activities		**(7,018)**	2,043	7,311
Cash flows from financing activities				
Cash was applied to:				
Dividends paid		**–**	–	–
		–	–	–
Net cash flows from financing activities		**–**	–	–
Net (decrease)/increase in cash and cash equivalents		**(6,494)**	29	7,839
Effects of exchange rate changes on the balance of cash held in foreign currencies		**–**	–	1
Opening cash and cash equivalents		**10,132**	2,292	2,292
Closing cash and cash equivalents		**3,638**	2,321	10,132

The accompanying notes form part of these financial statements.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

For the six months ended 31 December 2019

1. REPORTING ENTITY AND ACTIVITIES

The Institute of Geological and Nuclear Sciences Limited (trading as GNS Science) is established under the Crown Research Institutes Act 1992 and the Companies Act 1993. Its subsidiary companies are established under the Companies Act 1993. These financial statements have been prepared in accordance with the Crown Research Institutes Act 1992, the Public Finance Act 1989, the Companies Act 1993, the Crown Entities Act 2004, the Financial Reporting Act 2013 and New Zealand generally accepted accounting practice (NZ GAAP).

Consolidated financial statements for the Group comprising the Institute of Geological and Nuclear Sciences Limited (the Parent) and its subsidiaries are presented and the effects of intra-group transactions are eliminated in the consolidated financial statements. Subsidiaries are those entities controlled by the Parent. Control is achieved where the Parent has the power to govern the financial and operating policies of an entity to obtain benefits from its activities.

"The wholly owned subsidiaries of the Institute of Geological and Nuclear Sciences Limited are:

- IsoScan Limited
- IsoScan Food Limited
- Geological Surveys (New Zealand) Limited
- Geological Risk Limited
- GNS Science International Limited"

The principal activities of the Group are to undertake geoscience and isotope science research, development and commercial projects, predominantly in New Zealand. GNS Science International Limited holds a 50% interest in EDDI Project, an unincorporated joint operation formed to undertake a contract for dam hazard management in Vietnam.

These unaudited consolidated financial statements are for the six months ended 31 December 2019.

2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

These unaudited consolidated financial statements for the six months ended 31 December 2019 do not include all the notes of the type normally included in an annual financial report but have been prepared using the same accounting policies and methods of computation as, should be read in conjunction with, the financial statements and related notes included in the Group's Annual Report for the year ended 30 June 2019.

The financial statement figures for the six-month period ended 31 December 2019, and for the comparative six-month period to 31 December 2018 are unaudited. The figures for the year ended 30 June 2019 are audited.

The same significant judgments, estimates and assumptions included in the notes to the financial statements in the Group's Annual Report for the year ended 30 June 2019 have been applied to these unaudited consolidated financial statements.

These financial statements are presented in New Zealand dollars which is the Group's functional currency. Amounts have been rounded to the nearest thousand dollars.

3. RELATED PARTY TRANSACTIONS

The New Zealand Government is the ultimate shareholder of the Parent. No other transactions with New Zealand Government owned entities are considered as related party transactions in terms of NZ IAS 24 Related Party Disclosures.

Key management personnel

Key management personnel are those people with responsibility for planning, directing and controlling the activities of the Group. Key management personnel for the Group are considered to be the Directors and the Executive Leadership Team.

The Group purchases directors and officers insurance for the benefit of key management personnel in relation to the services they provide to the Group.

Contract assets and liabilities vary from year to year, dependent on the delivery terms of contracted work, and the timing of agreed invoicing or funding received between the Group and contracted parties.

in thousands of New Zealand dollars	**Unaudited 6 Months Dec-19**	Unaudited 6 Months Dec-18	Audited 12 Months Jun-19
Key management personnel compensation comprised:			
Directors' fees	**86**	98	195
Benefits for the Chief Executive and Executive Leadership Team	**1,265**	928	1,939
Total key management personnel compensation	**1,351**	1,026	2,134

The year-on-year decrease in directors' fees is due to the Board having one less director following the retirement of Steve Weaver in June 2019.

4. RECONCILIATION OF PROFIT AFTER TAX TO NET CASH FLOWS FROM OPERATING ACTIVITIES

in thousands of New Zealand dollars	**Unaudited 6 Months Dec-19**	Unaudited 6 Months Dec-18	Audited 12 Months Jun-19
Profit after tax	**100**	729	455
Add/(less) items classified as investing activities:			
Net gain on disposal of property, plant and equipment	**(2)**	(2)	(3)
Adjust non-cash items:			
Depreciation	**2,440**	2,307	4,852
Amortisation	**212**	242	657
Increase/(decrease) in credit allowance for doubtful debts	**43**	43	(40)
Net unrealised exchange loss/(gain)	**7**	7	(1)
(Decrease)/increase in provision for income tax	**(4)**	(293)	579
Increase in deferred tax asset	**–**	–	(576)
(Decrease)/increase in non-current provisions	**(930)**	1	(68)
	1,768	2,307	5,403
Add/(less) movements in working capital items:			
Decrease/(increase) in receivables and prepayments	**2,631**	783	(504)
Decrease in payables, current provisions, revenue in advance	**(4,631)**	(4,528)	(2,720)
Change in receivables and payables relating to investing activities	**271**	–	(673)
Decrease/(increase) in work in progress	**387**	(1,303)	(1,430)
	(1,342)	(5,048)	(5,327)
Net cash flows from operating activities	**524**	(2,014)	528

5. DIVIDEND

No dividends were declared by the Group for the six months ended 31 December 2019 (31 December 2018: Nil).

6. COMMITMENTS

Non-cancellable operating lease commitments
Operating lease payments are recognised on a systematic basis representing the pattern in which economic benefits from the leased asset are consumed over the lease term.

Leases are classified as finance leases whenever the terms of the lease transfer a significant portion of all of the risks and rewards of ownership to the lessee. All other leases are classified as operating leases. The Group has no leases which would be classified as finance leases.

in thousands of New Zealand dollars	**Unaudited 6 Months Dec-19**	Unaudited 6 Months Dec-18	Audited 12 Months Jun-19
Within one year	**149**	28	163
Between one and five years	**85**	19	92
Over five years	**–**	–	–
Total non-cancellable operating lease commitments	**234**	47	255

Capital commitments

in thousands of New Zealand dollars	**Unaudited 6 Months Dec-19**	Unaudited 6 Months Dec-18	Audited 12 Months Jun-19
Contracted and on order	**904**	1,076	907
Authorised but not yet contracted	**3,303**	2,114	2,115
Total capital commitments	**4,207**	3,190	3,022

7. CONTINGENT LIABILITIES

The Group has no contingent liabilities (31 December 2018: Nil).

8. EVENTS AFTER THE BALANCE DATE

There were no significant events after the balance date (31 December 2018: Nil).

RIGHT
Tongaporutu River Mouth, Taranaki coast

BACK COVER
Mount Taranaki, view from the north west

DIRECTORS

Dr Nicola Crauford, **Chairman**
Sarah Haydon, **Deputy Chairman**
Chris Bush
Felicity Evans
Dr John Sharpe
Paul White

EXECUTIVE LEADERSHIP TEAM

Ian Simpson, **Chief Executive**
Dr Gary Wilson, **General Manager, Strategy & Chief Scientist**
Justine Daw, **General Manager, Stakeholder Relations**
Peter Benfell, **General Manager, Science**
Andrew Simpson, **Interim General Manager, Business Services**
Rose Macfarlane, **General Manager, People and Culture**
Tania Gerrard, **Principal Māori Relations Advisor**

COMMUNICATIONS MANAGER

Simone Keough
Email: s.keough@gns.cri.nz

BANKERS

ANZ

AUDITOR

Trevor Deed
Deloitte Limited
On behalf of the
Auditor-General

SOLICITORS

Chapman Tripp

WEBSITES

www.gns.cri.nz
www.geonet.org.nz

PHOTOGRAPH ACKNOWLEDGEMENTS

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