MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HĪKINA WHAKATUTUKI

AIDE MEMOIRE

Overview of the New Zealand Oil and Gas Sector

Date:	14 March 2018	**Priority:**	High
Security classification:	In Confidence	**Tracking number:**	2518 17-18

Information for Minister
Rt Hon Jacinda Ardern **Prime Minister**

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s 9(2)(a)	Policy Advisor	s 9(2)(a)		

The following departments/agencies have been consulted

Minister's office to complete:

- ☐ Approved
- ☐ Noted
- ☐ Seen
- ☐ See Minister's Notes
- ☐ Declined
- ☐ Needs change
- ☐ Overtaken by Events
- ☐ Withdrawn

Comments

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Purpose

To provide an overview of the New Zealand oil and gas industry and the wider economic contribution of the sector to New Zealand.

s 9(2)(a)

Dr Marcos Pelenur
Manager, Resource Markets Policy
Building, Resources and Markets, MBIE
14 / 3 / 18

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Key Facts – Oil and Gas Sector	
Production (2016)	Oil production: 12.5 million barrels (11 million for export) Natural gas production: 213 petajoules (PJ)
Estimated Proven and Probable Petroleum Reserves (2016)	78 million barrels of oil 2020.4PJ of Natural Gas (represents approximately ten years annual demand)
Royalties and Energy Resource Levys (ERLs)	$170 million (2017) Over $1.3 billion dollars between 2013 and 2017
New Zealand GDP contributions[1]	2013 estimate of petroleum alone estimated approximately at $1.7 billion. Increases to $2.8 billion when value-add products (e.g. methanol, fertiliser) are included.
Taranaki GDP contribution	In 2013, estimated to be approximately $1 billion (12 per cent of Taranaki's GDP for that year). In 2016, GDP per capita was $71,297 (highest in New Zealand) reflecting the high skilled jobs relating to oil and gas industry.
Numbers employed[2] **(FTEs) (2014)**	**Taranaki:** Direct: 3,936 FTEs Direct, Indirect and Induced: 5,941 FTEs **New Zealand:** Direct: 4,653 FTEs Direct, Indirect and Induced: 8,481 FTEs
Exploration	21 active petroleum exploration permits in New Zealand. 12 active exploration permits in Taranaki. Nine petroleum exploration permits outside of the Taranaki region. Permits can last for up to 14 years and confer subsequent mining rights
Producing Fields	27 producing petroleum fields, all located in Taranaki. Pohokura field largest which supplies 36 per cent of New Zealand's natural gas. Other major fields: Kupe, Maui, Maari, Turangi, Tui, Kowhai, Kapuni and Mangahewa.
Decommissioning	MBIE expects four major offshore fields to be decommissioned before 2046. These are the Pohokura, Maui, Maari and Tui fields.
Permit Durations	Active exploration permit range from 10 to 26 years in duration. Permits issued through the current petroleum programme regulations are granted for up to 14 years. Mining permit length issued at discretion of the Minister of Energy and Resources (normally issued for commercial life of the field, 25 to 50 years).

Please note that the correct number of active petroleum exploration permits is 31, which was corrected in subsequent briefings.

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1 Statistics New Zealand only reports data for aggregate mining and petroleum sector.
2 Take from a 2014 study done by Martin Jenkins. Due to the oil and gas downturn since 2014 these numbers are likely to be an overestimate (but are the most recent available).

Oil and Gas Sector Overview

1. In 2016, New Zealand produced approximately 12.5 million barrels of oil, 11 million barrels of which was exported[3]. The majority of the oil produced in New Zealand is exported to Australia (where it fetches a premium price). Low quality cheaper crude oil is imported for domestic consumption.

2. Approximately 213 petajoules of gas was produced to the domestic market in 2016, which equates to about 23 per cent of New Zealand's energy supply[4]. All of the natural gas produced is consumed domestically for petrochemicals (50.1 per cent), electricity generation (26.5 per cent), industrial users (12.8 per cent), and commercial and residential (7.7 per cent).

Low oil prices have supressed investment in exploration in New Zealand

3. In recent years the Brent Crude Oil price has dropped from a high of USD$109 in 2014 to USD$28 a barrel in 2016. It has recently increased to USD$65 in recent months. Global investment in petroleum production has declined 56 per cent since 2014 due to low oil prices.

4. In line with global trends, low oil prices have supressed companies' interest in exploring for oil and gas in New Zealand. Exploration activity has fallen dramatically since 2014, as explorers have focused their reduced exploration budgets in other, less expensive markets. There were only four exploration wells drilled in 2015 and 2016, none of which were offshore, compared to 40 exploration wells in 2013 and 2014. This has been reflected in reduced interest in the petroleum block offer. In 2014, 15 permits were awarded through block offer; in 2017 this has reduced to one exploration permit being awarded.

5. There is an indication that the oil and gas industry is recovering from the downturn. Industry company margins are improving and they are now looking to increase the level of exploration expenditure.

The New Zealand Oil and Gas sector

6. There are twenty-seven oil and gas fields in Taranaki currently producing oil and gas, all of which are located either onshore or offshore in Taranaki. Of the fields recently developed, Pohokura is the field with the largest volume of reserve remaining, currently estimated at 1,476 petajoules. Pohokura alone provides 38 per cent of New Zealand's annual gross gas production. Other major producing fields include Kupe, Maui, Maari, Turangi, Tui, Kowhai, Kapuni and Mangahewa.

7. Main producers include Shell, Todd Energy, OMV, and Lattice Energy. In 2016, they collectively produced 70 per cent of New Zealand's oil and 90 per cent of domestic gas production. NZD$12bn has been spent in the past decade in the development and management of New Zealand's petroleum fields.

Current permit activity

8. As of March, there are twelve active exploration permits active in the Taranaki region, both offshore and onshore.[5] Exploration permits are awarded through the annual block offer process, and may be granted for duration of up to 15 years.

[3] 2016 figures are the latest available. Production data is reported for the previous year at the end of March.
[4] Including non-electricity uses of natural gas.
[5] Note that MBIE is currently processing one offshore exploration permit surrender.

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9. While there is no current production outside of the Taranaki region, there are numerous petroleum exploration permits. Since 2013, ten petroleum exploration permits have been issued in areas outside Taranaki through the block offer process.

10. Nine of these are currently active exploration permits outside the Taranaki basin, distributed as follows:

    a. Two permits in the Canterbury Basin.

    b. Two permits in the Great South Basin.

    c. Four permits in the East Coast Basin.

    d. One permit in the Waikato, King Country and Whanganui Basins.

11. Under the CMA, exploration permits give rights to permit holders to elect to apply for a subsequent mining permit if a commercially viable discovery of petroleum is made. Exploration activities normally include seismic surveying and drilling to identify petroleum accumulations. This is to ensure that permit holders have sufficient certainty to be able to commercialise their investment in exploration. This means that current exploration activity may inform development of petroleum producing fields with a life of between 25 to 50 years.

12. We have attached a map which outlines all active petroleum prospecting, exploration and mining permits as Annex One.

Petroleum Reserves and Security of Supply

13. The estimated 2P[6] reserves of oil are 78 million barrels of oil, and remaining gas reserves are estimated at 2020PJ. A key issue for New Zealand's security of supply is the estimated ten years of reserve for natural gas, at the current annual consumption rate (although demand is increasing – driven by industrial users).

14. New Zealand remains totally reliant on domestic gas supply as it does not have the infrastructure for the import of Liquefied Natural Gas (LNG) from overseas. Domestic gas demand has been increasing in recent years (largely driven by industrial users in the chemical manufacturing space).

15. Even with rising demand, estimated gas reserves have remained between 10 and 14 years of annual demand since 2003. Importantly, however, reserve additions have largely been provided by ongoing development at existing producing fields (moving gas from the contingent resource category into the reserve category) rather than through the discovery of any new fields. There has been no new discovery of note since the Turangi field was discovered in 2005.

Several of the Taranaki offshore fields are approaching end-of-life

16. Fields such as Maui and Kapuni are 50 to 60 years old and continue to produce today. However, these fields are nearing the end of 'primary production' (production provided from the natural flow of a reservoir). Both the companies and government agencies involved are considering the decommissioning of these fields, however, it is possible companies will employ additional drilling and seismic surveying to encourage the flow of hydrocarbons, maximise the production of petroleum and extend the field's lives.

[6] 2P refers to the proven (90 per cent chance of being recovered) and probable reserves (50 per cent chase of being successfully recovered).

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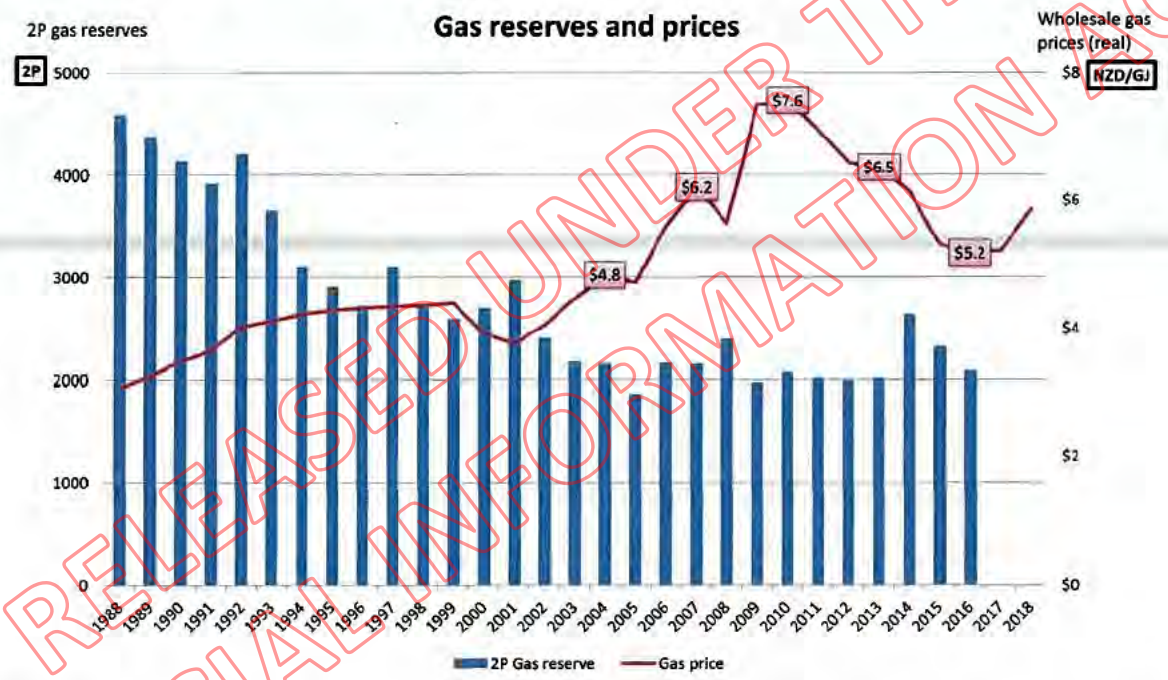
Please note that the figure of 18 per cent cited in paragraph 18 below was a preliminary figure only and has since been reevaluated.

17. The Tui field is also nearing the end of its productive life, with decommissioning expected to commence in two years. New owners, Tamarind New Zealand Pty Limited, are investigating extending the life of that oil field through additional drilling.

18. Officials are aware of a significant pending reserves downgrade of 18 per cent at the Pohokura field which is New Zealand's largest producing field. This is equivalent to approximately two-thirds of a single year's gas demand. It is likely to reduce the amount of gas reserves to fewer than ten years of annual demand. This would be the first time that this has occurred since the Maui reserve write down in 2002/03. We expect that Pohokura will need to be decommissioned sometime between 2020 and 2046[7].

Reducing gas supply will result in increased gas prices for consumers

19. There is a direct correlation between gas reserves and gas prices. Short-term wholesale gas prices have increased significantly in 2017 and 2018, indicating that gas supplies are becoming tighter. Decreasing gas reserves will result in higher prices for all gas consumers.



20. Note that there is growing demand for liquefied petroleum gas (LPG) in New Zealand, with import volumes subsequently growing. LPG is often used in situations where there is no access to a natural gas network (the South Island, with no natural gas network, is the primary consumer of LPG).

Transition and Future Developments

21. New Zealand, like the rest of the world, is looking to a future where emissions-heavy economic structures gradually transition to the use of cleaner, less emissions-intensive inputs. The role of petroleum and natural gas in a world transitioning to a lower-carbon future is an interesting and nuanced question.

[7] Note that reserves fluctuate from year to year depending on a combination of technical and market factors. The longer a field produces the more the operator learns about its production and reserves.

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Our export oil production is subject to international demand trends

22. New Zealand's oil production is almost entirely for export, meaning that demand is wholly dependent on global trends. International Energy Agency (IEA) analysis suggests that demand for oil is likely to increase for the next decade, with economic growth in major developing economies driving increased transport demand. Demand is expected to plateau post-2030 and begin to fall post-2040, as cleaner and more efficient technologies become mainstream across the globe. The widespread uptake of electric vehicles, for example, would be expected to contribute to this trend.

Natural gas has a role as a switching fuel

23. Natural gas is the "cleanest" fossil fuel with half the emissions of lignite coal. Due to its high energy density, gas can be used to replace coal in a wide range of applications, including in circumstances where renewable energy is either not feasible (for example, in applications where it would not generate the required heat) or is not available.

24. Consequently, natural gas presents a valuable opportunity to significantly reduce emissions in coal-reliant countries, including big emitters like India and China where energy demand continues to grow.

Our gas sector is not subject to global demand and supply trends

25. Since our natural gas is sold entirely on the domestic market, our natural gas industry is not as subject to global demand or supply trends. This is unless there were to be a significant new find which justified the investment in export infrastructure (through LNG). Investment decisions are subsequently more often driven by expected domestic demand than by international trends.

26. Nevertheless, current analysis suggests that global natural gas demand is likely to increase in the medium term, but eventually decline once cleaner alternatives are globally adopted. Domestic demand is expected to continue its current upward trend, particularly as thermal generation use declines, driven by industrial users of natural gas, for example, chemical manufacturing. Post-2030, a plateau and decline could be expected if technology had been developed that replaced the need for gas.

Economic Contribution of Oil and Gas to New Zealand

Direct benefits to the Crown

27. The Crown receives direct benefit from the petroleum sector through:

    a. Royalties[8] and the Energy Resource Levy (ERLs) paid to the Crown; and

    b. Company taxes

28. While royalties have been declining in recent years alongside the fall in the international price of crude oil and declines in domestic production, the petroleum sector still provided over $170 million in the way of royalties and ERLs in FY 2017 alone. Between 2013 and 2017, the petroleum sector paid over $1.3 billion dollars in royalties and ERLs.

29. The amount of corporate taxation is not precisely known due to taxpayer confidentiality.

[8] Royalty rates on petroleum fields differ substantially. For permits issued under the Crown Minerals Act the royalty rates that are applied are a hybrid of a 5 per cent revenue-based royalty and a 20 per cent profits-based royalty, whichever is higher. As royalties are deductible for tax purposes so the effective Crown take is approximately 42 per cent.

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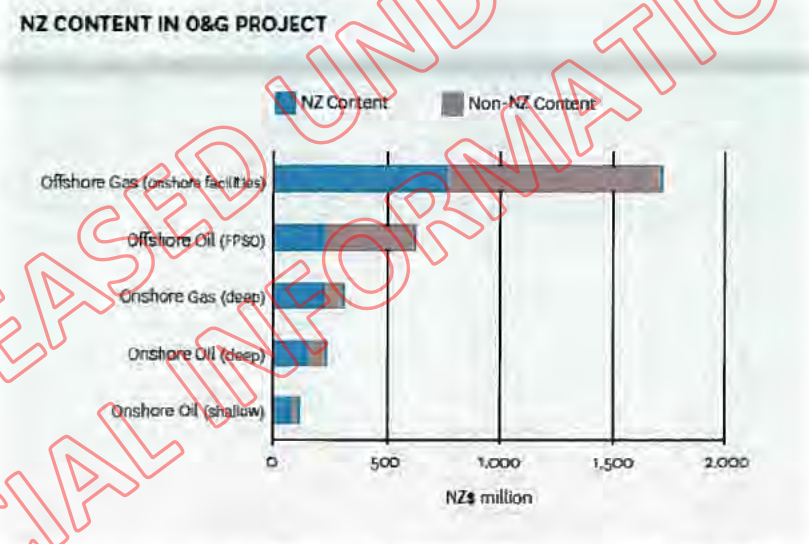
Employment

30. Based on a 2014 survey undertaken by Martin Jenkins on behalf of Venture Taranaki, the oil and gas industry directly employed 4,653 full time employees nationwide. Of these, 236 full time employees worked directly for exploration and production companies. Most jobs in the oil and gas sector are in the engineering or specialist and technical services sectors.

31. The level of employment that the petroleum industry provides is dependent on the stage of development oil and gas activity. Generally the early stages of oil and gas activity will see significant portions of work go to offshore specialist firms. This is because there is insufficient activity to support continuous presence of equipment in New Zealand.

32. Once decisions have been made to bring a field into production, local employment increases dramatically as New Zealand companies are more likely to participate in facility construction and ongoing operations and maintenance.

33. In terms of total expenditure, offshore oil and gas activities involve significantly greater costs than for onshore activities. MBIE is unable to undertake independent modelling of these costs in the time provided. However, Venture Taranaki provided the following estimates in 2014 based on discussions with oil and gas industry participants. This is set out in the graph below.



Source: Martin Jenkins, Venture Taranaki, The Wealth Beneath our Feet: The Next Steps

34. With the fall in oil prices since mid-2014, there has been a fall in activity levels and it is likely that there will be fewer jobs in the sector today than was estimated by Martin Jenkins. This is typical of the cyclical nature of the industry, with job levels likely to rise should there be a rise in oil prices in future (there are already some indications that the market is strengthening).

Gross Domestic Product

Contribution of oil and gas to GDP

35. Statistics New Zealand only reports GDP figures for the combined mining and petroleum sector, which makes estimating GDP contributions alone from oil and gas challenging. From the reported data, in 2015/16, combined petroleum and minerals extraction accounted for 1.0 per cent of GDP, or $2.4 billion.

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36. The total contribution to gross domestic product of the oil and gas sector in 2013 was modelled at $1.7 billion. This increased to $2.8 billion when it includes added-value manufacturing that uses gas as a feedstock (e.g. Methanex (methanol), Ballance Agri-nutrients (fertiliser), AICA New Zealand (glue) and Contact Energy's combined and peaker plants (electricity)) are added. The Taranaki region benefits disproportionately from this economic contribution.

37. As with job estimates, the contribution of the oil and gas sector to gross domestic product is likely to have fallen since mid-2014 following the fall in oil prices and consequent fall in activity levels.

Potential economic impacts of an oil and gas discovery

38. At different points in time, case studies have been undertaken on the potential economic impact of oil and gas developments in other parts of the country other than Taranaki. In June 2017, Martin Jenkins released an economic impact assessment of the Barque Field Development[9]. Should the field be drilled and a commercial discovery be made, then two development scenarios were modelled. In one development scenario, the field would contribute NZD$141 million to GDP annually and 950 jobs on an ongoing basis, while in the other it would contribute NZD$269 million to GDP and 1,980 jobs on an ongoing basis.

39. The operator of the permit, New Zealand Oil and Gas (NZOG) estimates this field may be two or three times the size of the Maui field. NZOG estimates that drilling has a 20 per cent chance of success (that is, one in five wells drilled would be expected to be successful).

40. In 2013 MBIE modelled a range of scenarios of oil and gas development on the East Coast of the North Island.[10] Under a "small-scale" scenario, the gross national disposable income of the East Coast region would grow NZD$160 million and 199 jobs would be created. This increased to NZD$1.4 billion and 1,163 jobs in a "large-scale" scenario.

Taranaki Employment and Wider Economic Benefits

41. The economic contribution of the oil and gas sector to the Taranaki region is set out in this section.

TABLE 3: OIL AND NATURAL GAS SECTOR, ECONOMIC IMPACT ON TARANAKI REGION, 2013

TARANAKI	DIRECT	DIRECT + INDIRECT	DIRECT + INDIRECT + INDUCED
Output ($m)	1,509	2,164	2,301
GDP ($m)	662	933	1,006
Employment (FTEs)*	3,936	4,718	5,941

Source: Martin Jenkins & Venture Taranaki, The Wealth Beneath our Feet: The Next Steps

[9] Martin Jenkins, *Barque Field Development Economic Impact Assessment: Final Report*, 9 June 2017, available at: https://www.nzog.com/dmsdocument/333.
[10] Ministry of Business, Innovation & Employment, *East Coast Oil and Gas Development Study*, March 2013, available at: http://www.mbie.govt.nz/info-services/sectors-industries/natural-resources/oil-and-gas/petroleum-expert-reports/east-coast-oil-and-gas-development-study/East-Coast-oil-gas-development-study-report.pdf.

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Employment

42. The Martin Jenkins study estimated that the full employment contribution is approximately 5,941 full time employees in the Taranaki region. These numbers have likely decreased due to the oil and gas downturn since 2014. The region has been affected by the downturn, with the impact felt much more broadly than just the immediate oil and gas sector (e.g. reduced financial contributions for community groups, schools and the coast guard).

43. s 9(2)(b)(ii) [redacted]

44. We expect that as some of the Taranaki oil and gas fields require decommissioning and late life management, the number of full time employees will increase.

Gross Domestic Product

45. Venture Taranaki estimated the GDP contribution from the oil and gas sector at approximately 1 billion in 2013. This corresponded to approximately 12 per cent of Taranaki's GDP for that year.

46. In 2016, Taranaki had the highest GDP per capita in the country at $71,297. However, overall Taranaki's GDP reduced 8.5 per cent, the largest of all regional decreases. This is likely due to the effects of the oil downturn.

Annexes

Annex One: Map of active petroleum permits in New Zealand

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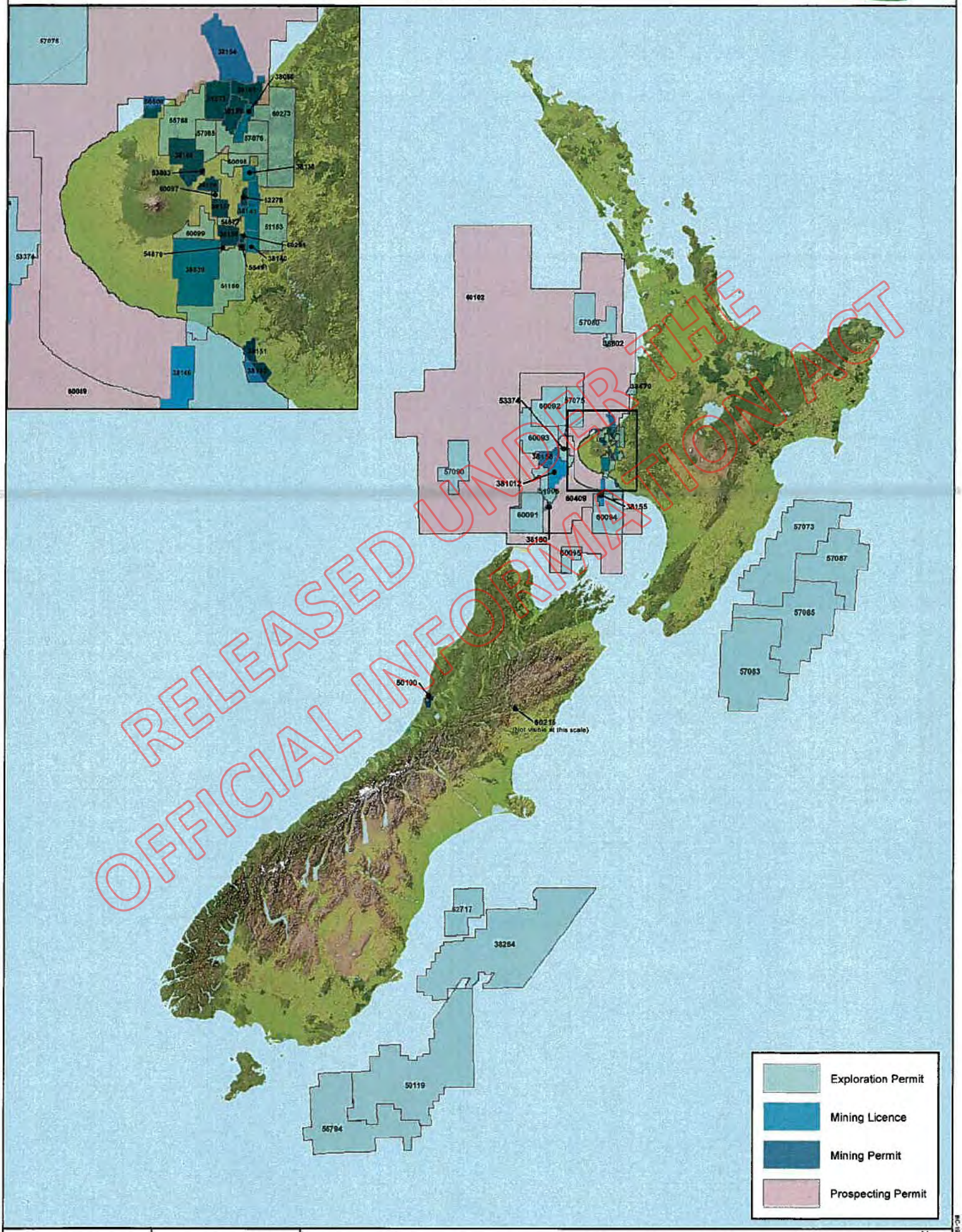
NEW ZEALAND
PETROLEUM & MINERALS

Active Petroleum Permits
March 2018



Exploration Permit
Mining Licence
Mining Permit
Prospecting Permit

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Date: 13/03/2018	Projection: NZTM Datum: NZGD2000	0 180 360 540 720 km	N

Annex One: Map of active petroleum permits in New Zealand

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