

12 November 2012

CLIMATE JUSTICE TARANAKI SUBMISSION
TO THE PARLIAMENTARY COMMISSIONER FOR THE ENVIRONMENT'S
INVESTIGATION INTO HYDRAULIC FRACTURING IN NEW ZEALAND

Climate Justice Taranaki is gravely concerned about the rapidly increasing impacts and looming threat of climate change to the future of humanity and earth's life support systems on which we rely. All major independent scientific organisations globally, including the [British Royal Society](#) and the [American Association for the Advancement of Science](#), agree that the present episode of climate change is caused by humans and that the major contributor is the combustion of fossil fuels. The Commissioner's own office describes climate change as "[the most important environmental issue facing the world](#)". As such we assert that hydraulic fracturing, through its contribution in maintaining the supply of, and hence our reliance on, fossil fuels, is inherently dangerous. It is delaying the overdue transition to renewable energy sources. Major economic reviews, including [Stern \(2006\)](#) and [Garnaut \(2008\)](#), have also clearly shown that continuing down a fossil fuel driven path and delaying actions "*would be dangerous and much more costly*".

1. Introduction

1.1 Climate Justice Taranaki (CJT) takes this final opportunity to provide input into the Commissioner's investigation on hydraulic fracturing in New Zealand, before she tables her report at the end of this month. We hope this investigation will provide the clarity required to properly inform the public and the government on both the perceived merits and risks of hydraulic fracturing in a New Zealand context. This submission is in part a response to [Todd Energy's submission](#) dated 11 October 2012 which is primarily a call to maintain the status quo re regulatory framework.

As eminent scientist Tim Flannery explains, "*Mining interests will fiercely resist ... regulation, for miners were born on the frontier and the laissez-faire spirit of the gold rush is alive and well among them. Civilising such powerful interest, which are deeply rooted in libertarian culture, is an extraordinary challenge—and already one element looks set to be the test bed of whether humanity can overcome such suicidal self-interests. That element of course is carbon*" ([Here on Earth p.195](#)).

1.2 CJT wants to raise public awareness about the complex issues surrounding hydraulic fracturing (HF) operations in New Zealand and their far reaching impacts, should they be allowed to proliferate. In that spirit, we have endeavoured to reveal the many aspects of HF operations and associated oil and gas activities that companies avoid talking about, and more specifically [how locals living among such operations are affected](#). We will also make this submission available to the public on [CJT website](#).

1.3 CJT welcomes the Commissioner, her team and other government officials to visit us and the Taranaki locals who have first-hand experience with the oil and gas industry, and in particular those living near to active wellsites that have been or are destined to be fracked. We would welcome the opportunity to provide any further information that may be helpful to the investigation.

1.4 Some 18 months ago when CJT held the first public meeting in Okato about NZ's fast expanding oil and gas acreage, few had heard of HF or fracking (fracking). As public and media interest grew, oil and gas companies began speaking out, offering selective information re HF. There are indeed variations in fracture treatments, target formations and the depths at which they are performed which affect the level of risks. However, companies and even our Taranaki Regional Council (TRC) repeatedly downplay these risks.

1.5 CJT has little confidence in so-called international best practice when it comes to HF, especially when the full process of drilling, fracking, production, transport and waste disposal is considered and as more evidence and documented cases of environmental and social impacts come to light in NZ and overseas. HF operations in this full context are not always safe and have caused serious environment impacts. Critically, there is no clear definition of "minimal impact" and "**minor adverse effects**" has no statutory meaning. We would certainly not describe the contamination of 300m³ of soil from each of at least four flare (blow-down) pits in Kapuni to be of minimal or minor impacts to the environment. 50m³ of that soil is so contaminated that it has to be taken to Wellington to be stabilised before it can be safely landfilled (See South Taranaki District Council [Information Report](#) dated 7 Aug 2012 and [Shell Todd's consent application \(RML12028\)](#)). There was already public outcry when Apache Canada and Tag Oil's plan to [truck fracking waste across the North Island](#) was revealed: "*Transporting toxic fracking fluid from Gisborne to Taranaki is an environmental disaster waiting to happen and is also culturally offensive,*" Green Party MP David Clendon.

2. Regulatory framework for hydraulic fracturing

2.1 The TRC had allowed HF to take place in Taranaki since the late 1980s, **without resource consents**. CJT queries whether by doing so, TRC had neglected or failed some of their key functions under the Resource Management Act (RMA). It was not until the end of July 2011 that due to increased public concerns, TRC introduced the requirement for **non-notifiable consents for HF** (See [TRC letter to industry dated 29 July 2011](#)).

2.2 The regulatory framework on HF in Taranaki has not been "enhanced" since August 2011. The **consenting process remains far from transparent or thorough**, given that the consents are all non-notifiable and 15 consents were issued in ten months. These consents, many valid for over a decade, allow the **discharge of HF associated contaminants into land (beneath wellsites) or air by combustion** (See [TRC consents for HF associated activities since August 2011](#)), sometimes without the full knowledge of the contaminants involved, not to mention the lack of public disclosure of any details of the HF process and chemicals involved. The recent revelation of **radioactive tracers** having been used by the oil and gas industry for decades is a case in point (See TDN article "[Radioactive-fracking consent sought](#) and [Shell Todd's application and AEE](#) for discharge at four Kapuni wellsites on TRC website). Notably, the use of radioactive tracers was not mentioned in TRC's HF risk assessment report—why?

Moreover, we have not found any consents issued for the discharge of HF associated contaminants onto land and into watercourses prior to or after August 2011. Will existing consents to discharge drilling wastes (potentially contaminated with returned frac fluids), produced water, treated waste water and stormwater, **onto land (e.g. landfarms) and into streams and tributaries**, be revised to include HF associated

contaminants under specific conditions? Will the monitoring regimes for such sites be reviewed and expanded to detect harmful fracking chemicals and radioactive elements?

The **Hazardous Substances and New Organisms Act 1996 (HSNO)** is far from adequate in protecting the environment from HF impacts. This was the reply from the Environmental Protection Authority (EPA) in April 2012 when asked about the chemicals used in HF: *“Currently we **do not have any controls that relate to the use of a substance in a hydraulic fracturing activity** as, to date, we have not processed a Part 5 application for a substance where fracking was the sole proposed use (or mentioned in the application as a possible use). ... The other mode of approval primarily for mixtures is via a ‘group standard’. .. a ‘blanket’ approval for a group of substances ... This is how the majority of the hydraulic fracturing substances are said to be approved. The relevant group standard is the ‘Additives, process chemicals and raw materials group standards’ ... It is up to the importer to determine if the substance is approved via a group standard.”*

When asked about the composition and quantities of chemicals used at a specific wellsite, EPA said it was the Department of Labour’s (DOL) responsibility to ensure that the HSNO is complied with in workplaces. When DOL was asked about such chemicals, the answer was: *“Duty holders are obliged to provide DoL Inspectors with information when they undertake their regulatory activities. This is done on an ‘**as required**’ basis to allow determinations of compliance on a case by case basis. We do not therefore need to routinely store detailed information of the type you originally requested in order to properly carry out our enforcement function. Responsibility for the approval of test certifiers lies with the Environmental Protection Agency...”*

2.3 TRC’s Hydrogeological Risk Assessment on HF cannot be considered independent or comprehensive, given that the bulk of the information has been provided by the oil and gas industry (See disclaimer of the [TRC HF risk assessment report](#)). The report, first released in November 2011 with incomplete information (data from 2000 listing 43 HF activities at 28 wells) was widely publicised. It concluded that *“there is little risk to freshwater aquifers from properly conducted hydraulic fracturing operations in the Taranaki Region. This assumes a combination of natural geologic factors, the use of good practices by industry, and regulation by the Council”*. The report was revised in February, then in May 2012 wherein 65 HF activities at 39 wells since 1989 were revealed. [Appendix I](#) of the May 2012 report compiled the material safety data sheets of **67 products containing numerous hazardous chemicals**, notably ethyl benzene and xylene (components of BTEX) which the industry claims not to have used in NZ. The lab results of frac fluid samples shown in [Appendix III](#) of the report also revealed presence of **BTEX, ethylene glycol, glutaraldehyde and significant levels of formaldehyde and acetaldehyde**. Neither the revisions of the report nor the details of the fracking chemicals was announced publicly, but simply appeared on TRC’s website.

Importantly, the risk assessment report ignored the findings in numerous oil and gas compliance reports. Many of these reports revealed **breaches of discharge consent conditions** and some were followed by removal or lowering of condition requirements (See [Taranaki Sites Map produced by CJT](#)). Whilst these reports did not mention HF specifically (as there were no specific consents for HF during their operations), they gave fair indications on the companies’ often **low level of compliance** (even though most were rated by TRC as “high” or “good”) and **TRC’s inadequate monitoring regime**.

Two of the key conclusions in the [GNS report on the effects of HF on seismicity](#) (Feb 2012) were: “*Within the limitations of the seismic monitoring system to detect and locate seismic activity, there is no evidence that hydraulic fracturing activities in Taranaki between 2000 and mid-2011 have triggered, or have had any observable effect on, natural earthquake activity.*” And “*There is no evidence that long-term deep injection activities, typically associated with waste water disposal at oil and gas operations in Taranaki, have had any observable effect on natural earthquake activity.*” The keywords here are “*limitations of the seismic monitoring system*” and “*observable effect*”, as the report stated clearly: “**No seismic monitoring occurs in Taranaki specifically for hydraulic fracturing operations or any other operations associated with oil or gas exploration or production.**” How could there be “evidence” when there is no specific monitoring?

A recent study by [Zoback \(2012\)](#) explained “*The concern about triggered seismicity associated with shale gas development arises after hydraulic fracturing, when wastewater that flows back out of the wells is disposed of at dedicated injection wells.*” The study went on to propose five steps to help regulators and operators reduce the risk associated with triggered earthquakes. GNS and TRC however, have remained in denial and made no effort in preparing for or reducing the potential risks that can be caused by HF and **deepwell injection of wastes.**

2.4 Instead of providing greater transparency in response to public concerns, the industry has continued to “spin”, tell the public half-truths, claim media space, insist on confidentiality agreements with landowners, and **buy their so-called “social license” with donations and sponsorships** for schools, community groups and public events (e.g. WOMAD). “*The bully-boy tactics employed by some of the petrochemical men is still very recent ... a sick, elderly man in his seventies from down the road sat at our dining room table and explained why he had signed a consent for Fletcher Challenge ... You see, he’d been told that if he didn’t sign, they’d hop over the fence to his neighbour’s property and he didn’t trust his neighbour. He thought he’d have more control if it was on his own place. And pitching neighbour against neighbour was common practice, compounded by [confidentiality agreements](#)” (Jury, 2012).*

2.5 **Data disclosure requirements** under the resource consents should require the provision of all data needed to address any potential environmental and safety issues related to the consented activities in a timely manner (e.g. the composition and quantity of drilling and fracking chemicals and radioactive tracers to be used at specific wellsites on specific days; composition and hazards of contaminated soils to be spread on landfarms; emissions from flares). The public, especially those directly and indirectly affected by the consent holders’ activities, should have access to such information. It is absolutely unjust for TRC to refuse information and even label concerned residents, Roberts, Morrison and Self, who question the safety of their drinking water and the oil and gas industry, as “mischievous” and “vexatious” ([TDN, 30 August 2012](#)).

2.6 The hydraulic fracturing consent framework implemented by the TRC should be thoroughly and **independently reviewed and reformed** to provide adequate protection to the environment and to the public, based on the **precautionary principle**. The central government should not force councils to process consent applications related to HF until such a review and reform is completed.

2.7 **CJT urges that HF be banned outright in NZ.** Should HF be allowed to proceed, much stronger regulations are urgently needed in view of the historical, current and potential environmental, social and economic damage by HF in New Zealand and overseas, taking into account impacts from the drilling, fracking, production, transport and disposal processes. A recent study on hydrocarbons operations involving HF in Europe identified “**a number of issues as presenting a high risk for people and the environment**”, **over the entire process from well pad site identification to well abandonment** ([AEA/ED57281/Issue No.17, August 2012](#)).

3. Environmental and Social risks associated with hydraulic fracturing

3.1 Many of the environmental risks raised as concerns relating to HF apply to all exploration and production drilling. However, the recent advancement in HF, combined with multi-staged, horizontal drilling, and the aggressive expansion of the oil and gas acreage across Taranaki and much of NZ, mean that the environmental risks entailed will be unprecedented. The **environmental and social impacts will be complex, far reaching and irreversible**. As East Coast landowner Wilcox wrote to Tag Oil and Apache, “*Our mother left us the responsibility as kaitiaki of this land. We have been here 15 generations and our responsibility is to care for this land, and to pass it on for another 15. And [we don't want our land to be violated in this way...](#)*”

Moreover, gas exploration can have devastating [financial impacts on farmers](#), such is the case in an area 250km wide in Queensland, Australia, where none of the properties with gas could be sold in the past two years. Similarly, farm owners with contaminated soil or water supply have little hope of selling out and retire in comfort. Indeed, **expansive landuse changes and conflicts with farming, tourism** and other economic activities cannot be ignored.

3.2 The primary environmental concern raised in relation to HF is the **risk of contaminating shallow freshwater aquifers, surface water and soil** with hydrocarbons, hazardous chemicals in frac fluids, radioactive tracers and methane. Already there are questions about potential contamination of Taranaki's local drinking water supplies due to discharges from oil and gas operations, not to mention the possibility of milk contamination and **impact on NZ's dairy export**. Emissions from unconventional natural gas development, mostly facilitated by HF, contribute substantially to greenhouse gases, and are known to cause numerous health effects to nearby residents ([McKenzie et al. 2012](#)).

3.3 Companies consistently emphasize the depths (3,000-4,900m) at which HF are conducted, without any mention of the shallower operations (<2,489m), the shallowest of which took place at two **Manutahi wells <1,160m deep** which is a mere 257m from the freshwater/ saltwater interface ([TRC HF risk assessment report, May 2012](#)). Moreover it is “**connectivity**” rather than (in addition to) “depth” that determines the level of risk of contaminating a shallow freshwater aquifer or surface water during and after such treatments ([Mooney, 2011](#)). In fact, there are **numerous pathways**, including abandoned wells, through which contamination can occur. Importantly, research on aquifers in NZ has been limited, and the extent and connectivity between freshwater and saline aquifers are not well known.

3.4 While companies may claim that they use state-of-the-art well construction and fracture monitoring procedures, the reality on the ground points to otherwise. In September 2009, two Cheal A production wells were reported to have been losing power fluid down hole since 2007, due to **suspected integrity issues with casing patches**. No sampling of fresh groundwater was conducted despite this ([TRC doc 717351, 2010](#)). Water testing was only conducted in early 2012, after months of requests from concerned residents. Meanwhile, unlined storage pits, single skinned diesel fuel tanks, and repeated spillages were reported at various sites (See [Taranaki Sites Map produced by CJT](#)). In the US, “*State and federal regulators often do little to confirm what pollutants go into wells for drilling waste. They rely heavily on an honor system in which companies are supposed to report what they are pumping into the earth, whether their wells are structurally sound, and whether they have violated any rules*” (Lustgarten and ProPublica in [Scientific American, 20 Sept 2012](#)).

3.5 Some potentially serious environmental and health risks associated with HF in Taranaki would be consented discharge of drilling wastes (containing returned frac fluids) onto land and near to streams, consented discharge of treated wastewater, produced water and stormwater into waterways, and accidental surface spillage of chemicals or frac fluids containing low concentrations of highly hazardous chemicals. Most notably, glutaraldehyde, 2,2-dibromo-3-nitrilopropionamide (DBNPA) and ethylene glycol monobutyl ether (2-BE), all listed in TRC’s HF risk assessment report Appendix I, are known to be **‘dangerous at concentrations near or below their chemical detection limits’** ([www.gasdrillingtechnotes.org](#)). Such chemicals pose significant risks to workers handling them as well as farmers / landowners who choose to have drilling and fracking wastes spread on their land, and farm animals grazing in the vicinity.

South Taranaki District Councillor Michael Self who has been conducting anecdotal research said, “*I think the councils should be looking and comparing blocks. I've lived in the Waimate West county area pretty well all of my life and I look at the Kapuni area, which is in the former Waimate West county, and, in about a 6-kilometre radius, [I see lists of cancer and I see birth defects](#). Compare it to a block around Auroa and I don't see the same numbers or rate.*” The people he talked to didn't want publicity because “*They don't want to be ridiculed.*”

In Pennsylvania, USA, farmer Carol French questioned, “*How safe is our food that is produced or grown in what was once a pure agricultural land, and is now becoming an industrial waste land surrounded by slick water hydrofracking?*” Carolyn ... and I have asked this question and were [told to be quiet](#).” In many cases, people who have fallen sick opt to go silent in exchange for filtration systems or health care support from oil and gas companies, making it impossible to understand the **true health impacts** associated with oil and gas operations. Indeed “*Without rigorous scientific studies, the gas drilling boom sweeping the world will remain an **uncontrolled health experiment on an enormous scale***” ([Bamberger and Oswald, 2012](#)).

3.6 The types of chemicals used for hydraulic fracturing may have changed over the years. Between 2001 and 2005, the two Manutahi wells that were drilled to 1157 m depth, plus 13 others, were **fracked with diesel** ([TRC HF risk assessment report](#)), not the water-based fluids that companies and TRC have led us to believe. Interestingly, the drilling and fracking with oil-based fluids have created particular challenges to the disposal of oil-based wastes (See 35/36. Origin / Geary drilling waste land treatment site and landfarms in [Taranaki Sites Map produced by CJT](#)).

4. Seismicity

4.1 Downhole micro-seismicity (below 2M on the Richter scale) induced by fracking, is unlikely to be felt at the surface. Slightly higher energy events have been linked with fracking in some countries, related to geothermal projects, but also deepwell injection of drilling wastes. In March 2012, confirmed links between deepwell injection of drilling wastes and a series of [earthquakes \(max 4.0\) in Ohio](#) prompted a moratorium on deepwell injection. In April 2012, two small earthquakes in Blackpool the year before were confirmed as caused by fracking. The [quakes damaged the integrity of at least one well](#). Most, if not all, drilling in Taranaki is on fault lines.

4.2 [GNS report on the effects of HF on seismicity](#) (Feb 2012) revealed no evidence that fracking in Taranaki from 2000 to mid 2011 *“have triggered, or have had any observable effect on, natural earthquake activity”*, bearing in mind limitations of the existing GeoNet monitoring system. Experts warn that **more stringent monitoring** of well integrity, pore pressure perturbations, modern 3-D seismic imaging and [operational protocols](#) are needed to ensure safety.

4.3 Public concern has been expressed about the possibility of HF operations activating a natural fault. The risk of this occurring in deep gas formations in Taranaki may be slight. But what about the **risk of a natural earthquake, landslide or other disasters causing serious damage or compromise the integrity of oil and gas infrastructure and operations** such as fracked wells and deepwell injection sites? With the fast expanding oil and gas and associated industry, driven largely by fracking, such risks cannot be underestimated.

4.4 CJT can only hope that companies' normal risk assessment for planning hydraulic fracturing includes accurate identification of the presence of any faults, specifically for their avoidance, bearing in mind that in Canterbury, previously **unknown faults** were responsible for the devastating Christchurch earthquakes.

4.5 Avoiding hydraulic fracturing near faults will hopefully also avoid the costs of lives and infrastructure. Avoiding HF altogether will avoid a suite of environmental, social and economic damages, including its contribution to climate change through continuing fossil fuel production and use.

5 Maori perspective

5.1 Under the current rules and regulation of the Resource Management Act, tangata whenua are allowed limited, if any, control over the use of resources in their rohe. [Te Tiriti o Waitangi](#) and the [UN Declaration of the Rights of Indigenous Peoples](#) were signed by the crown and assured tangata whenua the control over their resources. The latter has not happened, especially in regard to petroleum and water extraction and for waste disposal. The crown needs to accept Te Tiriti which almost all of the signing iwi and hapu agreed to, not The Treaty and the crown's associated assumed principles. The crown needs to allow tangata whenua their legal and moral rights or face continued national and international condemnation.

5.2 What we currently see in regards to tangata whenua involvement in fracking procedures is council or company consultation with often self-chosen representatives from tangata whenua. This happens only where the council deems it necessary and indeed the RMA does not require enough reasons for tangata whenua consultation. The most common example is where known waahi tapu may be damaged or destroyed. Tangata whenua are already under pressures with poverty and battles over settlement and other breaches of their rights. Some tangata whenua do not register waahi tapu (whether private or not) as they do not trust that the crown will not abuse this information. Occasionally the Historic Places Trust (HPT) is consulted with over waahi tapu instead of tangata whenua, causing confusion and misinformation. For example, in the case of the Brown Road landfarm, HPT confirmed that an old pa site would not be disturbed by the activities of dumping drilling and frac waste because the waahi tapu was no longer distinguishable. Subsequently it was discovered that HPT had the wrong location for the waahi tapu (TRC consent application 7884-1 6815).

6. Natural gas cannot be a transition fuel

6.1 CJT supports the move to sustainable energy sources and true solutions that foster justice and help to alleviate the impacts of climate change, i.e. [climate justice](#).

6.2 Fossil energy sources are coming to an end. Our dependence on non-renewable energy must also come to an end, whether we like it or not. **The longer we delay the transition to renewable energy sources, the more costly it will be on the environment and economy.**

6.3 The technologies in solar, wind, hydro, wave and tidal energy are advancing rapidly, and can have increasingly important roles in our future sustainable energy mix, if the government would **stop investing in and promoting non-renewables**. Energy conservation and efficiency, as well as community reorganisation and a shift away from “growth at all cost”, will contribute a great deal towards energy sufficiency.

6.4 Natural gas is a non-renewable fossil fuel. *“The footprint for shale gas is greater than that for conventional gas or oil when viewed on any time horizon, but particularly so over 20 years. Compared to coal, the footprint of shale gas is at least 20% greater and perhaps more than twice as great on the 20-year horizon and is comparable when compared over 100 years”* ([Howarth et al. 2010](#)). **Even if natural gas is “cleaner” than coal, it is not a transitional fuel.** Its promotion will only further delay any real transition to renewable energy and reduction in greenhouse gas emissions.

6.5 The continuous reliance and promotion of tight gas resources, driven by the use of fracking, is environmentally and socially irresponsible. CJT urges the government to move onto developing an **effective energy transition strategy, affordable public transport systems, and sustainable agriculture** that do not rely heavily on petrochemicals. These, together with support for local initiatives that foster sustainability, resilience and true, green innovations, are what New Zealanders deserve, now and for future generations.