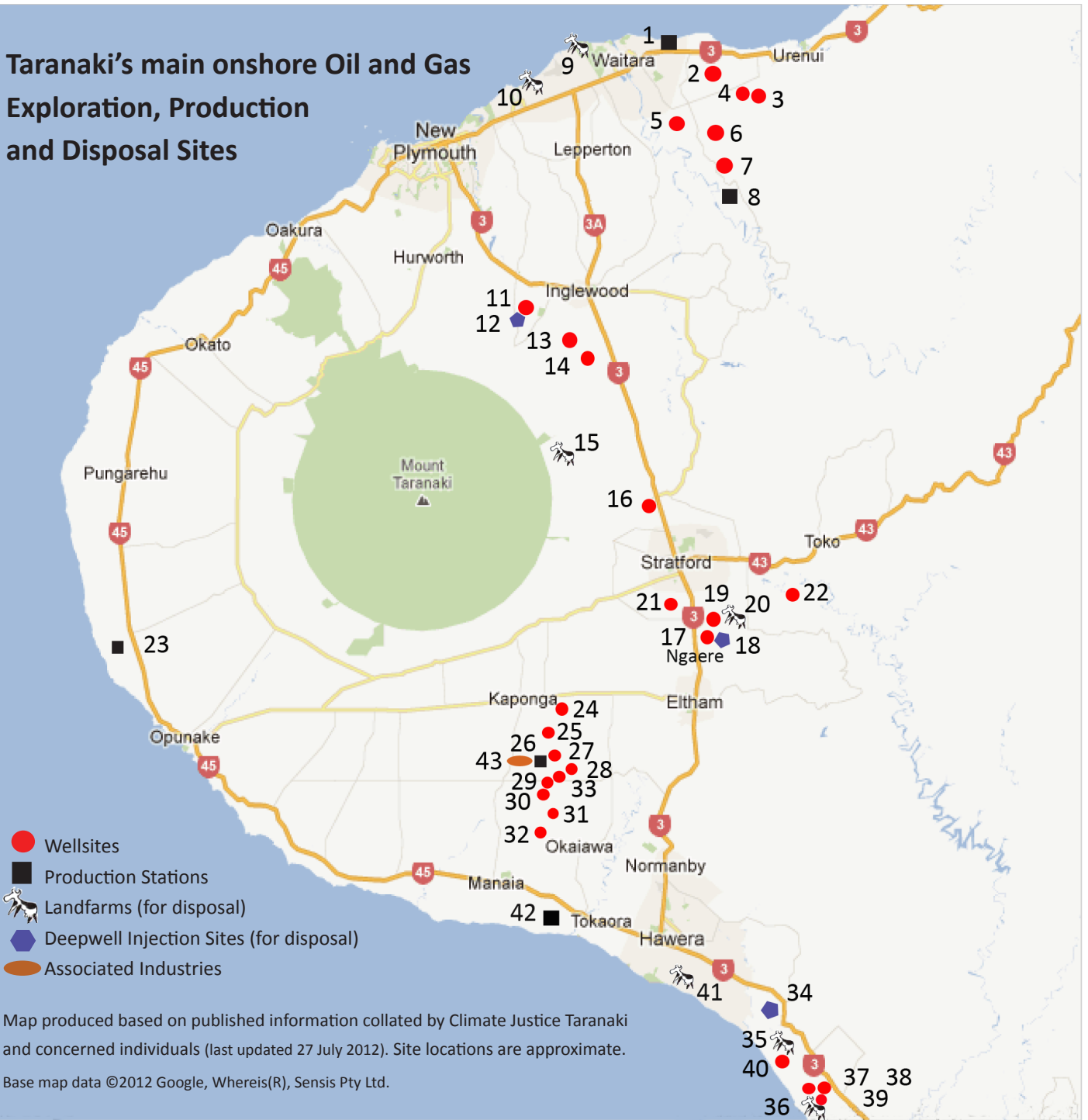


# Taranaki's main onshore Oil and Gas Exploration, Production and Disposal Sites



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|---|--|--|
| 1. Methanex Motunui Facility                                    | 14. Tag Oil Sidewinder Wellsite and Production Station | 29. Shell Todd Kapuni KA 13  |
| 2. Greymouth Turangi A wellsite                                 | 15. C Boyd Drilling Waste Stockpile Site and Landfarm  | 30. Shell Todd Kapuni KA 2   |
| 3. Greymouth Ohanga A wellsite                                  | 16. Bridge Petroleum Radnor 1B Wellsite                | 31. Shell Todd Kapuni KA 6/11/17                                   |
| 4. Greymouth Ohanga B wellsite                                  | 17. Cheal A Wellsite and Production Station            | 32. Shell Todd Kapuni KA 3   |
| 5. Greymouth Kowhai B wellsite                                  | 18. Cheal A Deepwell Injection Site                    | 33. Shell Todd Kapuni KA 5/10                                      |
| 6. Todd Mangahewa 3 Wellsite                                    | 19. Cheal B Wellsite                                   | 34. Origin Rimu Production Station and Deepwell Injection Site     |
| 7. Todd Mangahewa C/A Wellsite                                  | 20. Cheal B Mix Bury Cover Landfarm                    | 35. Origin / Geary Drilling Waste Land Treatment Site and Landfarm |
| 8. Todd McKee Production Station                                | 21. Cheal C Wellsite                                   | 36. Origin Drilling Waste Landfarm (Spence Rd)                     |
| 9. BTW Brown Rd Landfarm  | 22. Kea Wingrove 2 Wellsite                            | 37. Origin Manutahi E Wellsite                                     |
| 10. Todd Pohokura Terrace A Land Treatment Site                 | 23. Shell Todd Maui Production Station                 | 38. Origin Manutahi F Wellsite                                     |
| 11. Greymouth Kaimiro Production Station and Wellsites          | 24. Shell Todd Kapuni KA 8/12/5/18                     | 39. Origin Manutahi H Wellsite                                     |
| 12. Greymouth Kaimiro J Deepwell Injection Site                 | 25. Shell Todd Kapuni KA 4/14 Wellsite                 | 40. Origin Kauri E Wellsite  |
| 13. Greymouth Ngatoro Production Stations and Wellsites A and B | 26. Shell Todd Kapuni Production Station               | 41. Greymouth Hawera Landfarm                                      |
|   | 27. Shell Todd Kapuni KA 1/7/19/20                     | 42. Origin Kupe Production Station                                 |
|   | 28. Shell Todd Kapuni KA 9                             | 43. Ballance Agri-Nutrients Ammonia Urea Plant                     |

## 1. Methanex Motunui Facility

**Location:** Main North Road, Motunui

This facility produces methanol and gasoline from natural gas. It holds discharge consents for stormwater, wastewater, contaminants and emissions to air (TRC document 995835, 2012). A major community campaign led by local hapu fought against its establishment in the 1980s. Methanex now plans to restart its Waitara plant by 2014 and is considering producing methanol from coal-seam gas. Next to Methanex in Motunui is Shell Pohokura Production Station which processes gas from the Pohokura gas field in nearshore waters.

## 2. Greymouth Turangi-A Wellsite

**Location:** Turangi Road, Motunui

**Discharge consents:** For treated stormwater and treated produced water onto and into land near Parahaki Stream; produced water, well drilling fluids, well workover fluids and contaminated stormwater into the Mt. Messenger Formation by deepwell injection; emissions into air.

**Monitoring:** Suspended solids exceeded consent limits. "Discharge may be having some effect in the receiving waters, although the levels are very low." TRC collected only two water samples (TRC doc 931319, 2011).

**Fracking:** Turangi 1, 2 & 3 were fracked multiple times in 2006 and 2008 (TRC HF report, May 2012). In Nov 2011, Greymouth was granted a new consent to discharge contaminants associated with hydraulic fracturing (HF) into land beneath Turangi-B (650 Main North Rd).

## 3. Greymouth Ohanga A Wellsite

**Location:** 324 Ohanga Road, Onaero

**Monitoring:** No report found on TRC website.

**Fracking:** In March 2012, TRC granted a new consent for the discharge of contaminants associated with HF at Ohanga A.

## 4. Greymouth Ohanga B Wellsite

**Location:** Waiau Road, Urenui

**Monitoring:** No report found on TRC website.

**Fracking:** In May 2012, TRC granted new consents for the discharge of contaminants associated with HF at Ohanga B.

## 5. Greymouth Kowhai-B Wellsite

**Location:** 451 Ngatimaru Road, Tikorangi

**Discharge consents:** For treated stormwater and produced water onto and into land; stormwater and sediment from earthworks onto and into land; emissions into air.

**Monitoring:** No report on Kowhai-B found on TRC website. Kowhai-A was inspected as part of monitoring for Turangi-A wellsite (TRC Doc 931319, 2011). Swift Energy was charged with allowing the discharge of drilling mud, sediment and contaminants from Kowhai-2 well into a N. Taranaki stream in Dec 2006, breaching the Resource Management Act 1991.

**Fracking:** Kowhai A1 was fracked multiple times in 2009 (TRC HF report, May 2012). In Feb 2012, TRC granted new consents for the discharge of contaminants associated with HF into land beneath Kowhai-B; and emissions to air from combustion of returned HF fluids.

## 6. Todd Mangahewa-3 Wellsite

**Location:** Tikorangi Road East, Waitara

**Discharge consents:** For stormwater and sediment into and onto land near an unnamed tributary of Waiau Stream; solid drilling wastes into land; drilling muds, cuttings and drilling wastes onto and into land via mix-bury-cover; emissions to air from flaring (up to eight wells); also a consent to take and use water.

**Monitoring:** TRC's monitoring for 2006-07 included 6 inspections and auditing of company information. No water samples for physicochemical analysis, no biomonitoring surveys of receiving waters and no ambient air quality analyses (TRC doc 317804, 2007).

**Fracking:** TRC HF report does not list Mangahewa-3. NZPAM website said Mangahewa-3 was fracked in 2007 but the reference was deleted on 24 July 2012.

## 7. Todd Energy Mangahewa C/A wellsite

**Location:** Otaraoa Road

**Monitoring:** No report found on TRC website.

**Fracking:** Mangahewa 2 and 6 (in Mangahewa C) were fracked multiple times in 1997 and 2010 (TRC HF report, May 2012). In Jan 2012, Todd was granted a new consent to discharge contaminants associated with HF into land beneath Mangahewa-C. Similar consents were also granted for Mangahewa-A and D.

## 8. Todd Taranaki McKee Production Station

**Location:** Otaraoa Road near Tikorangi

This site includes the McKee and adjacent Mangahewa Production Stations, and the McKee Electricity Generation Plant commissioned in 2009. The construction of an LPG plant adjacent to the production station has begun.

**Consents:** To take and use water from Mangahewa and Mangaone Streams in the Waitara Catchment; to discharge stormwater and wastewater, emissions into air; to divert unnamed tributaries of the Mangahewa Stream. Todd also holds 28 consents for wellsites associated with the stations (Makara-B; Mangahewa-A, 3 & D; McKee-A, B, C, D & E, Mystone-A, Pouri-A, Pukemai-A, Toetoe-A, B & C; Tuhua-A, B, C, D & E).

**Monitoring:** "For the discharge to Waitara River... pH 6.3 outside the consented range, ... hydrocarbon concentration... suspended solids exceeded limits. No explanation was provided by Todd... Due to the significant dilution in the Waitara River these isolated cases are no cause for concern... the Company demonstrated a high level of environmental performance and compliance ..." (TRC doc 850353, 2011).

## 9. BTW Brown Road Landfarm

**Location:** 70 Brown Road, Brixton

**Discharge consents:** For water-based drilling mud (WBM), synthetic based mud (SBM) and oily wastes; for drilling waste, oily waste, condensate storage tank wastewater, and well work-over fluids which includes frac fluids (new consent).

**Monitoring:** Glutaraldehyde (toxic) was detected in the frac water pits. "Liquid from the SBM pit was seeping through the pit wall and into the paddock... Grass regrowth for the recent application area looked well established, and

bulls were grazing the pasture. Concentrations of contaminants in surface soil meet the required consent conditions, with the exception of hydrocarbons. Further monitoring of the site will ensure that any consent limits exceeded are complied with prior to surrender [2020/2027]" (TRC doc 778400, 2010; doc 987702, 2012).

## 10. Todd Pohokura Terrace A Land Treatment Site

**Location:** Airport Drive, Bell Block

**Discharge consents:** For drilling cuttings and fluids with WBM and drilling cuttings with SBM onto and into land via land farming.

**Monitoring:** "Levels of hydrocarbons and barium in the SBM disposal area were above guideline values... Further monitoring is required to ensure that all parameters comply with consent conditions prior to surrender..." Some of the required information was not supplied" No surface or groundwater testing (TRC doc 340652, 2007). See also TRC doc 540609 (2009).

## 11, 12. Greymouth Kaimiro Production Station & Deepwell Injection Site

**Locations:** Upland Road, Inglewood

**Discharge consents:** For stormwater and treated wastewater into Mangaoraka Stream; sand waste to land for storage; emissions into air; also a consent for groundwater abstraction.

**Monitoring:** "Chemical water sampling of the discharge from Kaimiro Production Station was undertaken on two occasions... the discharge was mostly in compliance with consent conditions... The pH of the discharge was at or below the consent limit... but not low enough to be of concern given that newer stormwater discharge consents have a pH limit of 6.0 to 9.0. The hydrocarbon content ... was more than twice the consent limit" (TRC Document: 914255, 2011).

**Fracking:** Kaimiro 1, 2 and 3 were all fracked, the last being Kaimiro 2 ST1 in June 2011 (TRC HF report, May 2012). In Sep 2011, Greymouth was granted a new consent to discharge produced water, well drilling fluids, well workovers fluids, HF fluids and 'off-spec' stormwater at Kaimiro-J by deepwell injection.

## 13. Greymouth Ngatoro Production Stations

**Locations:** Ngatoro-A Production Station on Upper Dudley Road, Ngatoro-B on Bedford Road.

**Discharge consents:** For stormwater and treated wastewater into Ngatoro Stream; emissions into air. Conditions require advance notification of the disposal of production water via the stormwater system. Note Ngatoro Stream is the sole source of water for Inglewood Water Treatment Plant which supplies 3300 people.

**Monitoring:** "The quality of the discharge... declined markedly from the improvement shown in recent years... Chloride levels on two occasions exceeded historical median and were accompanied by elevated hydrocarbon levels. However, no consent conditions were breached and monitoring of the receiving waters did not show any significant impact from the Ngatoro-A discharge... hydrocarbons detected in the discharge were light, volatile compounds that were not completely removed by the produced water treatment process" (TRC doc 914255, 2011).

**Fracking:** Ngatoro 1, 7, 9 were fracked in 2001-02.

#### 14. TAG Oil Sidewinder Wellsite

**Location:** 323 Upper Durham Road, Inglewood

**Discharge consents:** For treated stormwater into land and into Piakau 1 stream; stormwater and sediment from earthworks onto and into land; emissions to air; also consents to take and use water, and to install pipelines for hydrocarbon conveyance over the bed of an unnamed tributary of Piakau Stream.

**Monitoring:** On 28/9/10 a moderate spill resulting in “drilling mud entering the ring drain”; 15/2/11 “some of the hazardous substances were not banded”; 21/2/11 concern over “Halliburton’s practices surrounding cleaning pipes and containment of any discharged product” and action to “ensure that all hazardous substances are banded”; 9/3/11 advised of a diesel spill; 15/4/11 a diesel and a cement spill; 5/5/11 chloride and suspended solids too high when entering stream; 18/5/11 hydrocarbons observed discharging into ring drain... compliance was not achieved with hazardous storage area or keeping to concentration limits for discharge. However the company still received a good performance rating (TRC doc 890325, 2011).

**Fracking:** Not listed in TRC HF report, May 2012.

#### 15. C Boyd Drilling Waste Stockpile Sites and Landfarm

**Location:** Derby Road N and Surrey Road sites near Inglewood, border with national park.

**Discharge consents:** For drilling waste onto and into land via landfarming and landspreading; stormwater from drilling waste storage site into an unnamed tributary of Mangamawhete Stream in Waitara River; sludge and other residuals from New Plymouth District water treatment plants onto and into land (25m from Mangamawhete, Mangatengehu and Waipuku Streams).

**Monitoring:** In 2008-09, “The consent holder’s level of environmental performance and compliance with the resource consent had been good, until near the end of the monitoring period when a significant noncompliance resulted in the issuing of an abatement notice” (TRC doc 662396, 2010). In 2009-10, four incidents, “...improvement is required for environmental performance, particularly for activities not complying with rules for permitted activities. Remedial actions were required to deal with incidents...” One inspection comment read, “Pasture had died off in the areas where the mud was thickly applied, but the other areas looked healthy and almost no sign of the application was visible. Cows were grazing one paddock where muds had been applied and were working the mud into the soil nicely with their hoof action” (TRC doc 830821, 2011).

#### 16. Bridge Petroleum Radnor 1(B) Wellsite

**Location:** Radnor Road, Midhurst

**Consents:** For emissions to air; treated stormwater and treated produced water; stormwater and sediment from earthworks; drilling muds, drilling cuttings, and drilling wastes (up to 9000m<sup>3</sup> by mix-cover-bury); to take groundwater during hydrocarbon exploration and production operations (from up to six wells); and to take water from the Piakau Stream.

**Monitoring:** Inspections revealed, “...the final skimmer pit was clear of hydrocarbons but there was silty water in the south eastern skimmer

pit. The secondary/additional skimmer pit is to have the sorbent pads replaced. The stockpiled drill cuttings that were awaiting removal may be the cause of skimmer pit contamination.... The eastern flare pit contained drilling fluids and muds and was to be cleaned up... An additional skimmer pit was constructed within the ringdrain to safeguard skimmer pits following a leak of light hydraulic oil.” No abstraction or discharge monitoring was undertaken by the Council. No air discharge or receiving environment monitoring. A complaint regarding the disposal of drilling muds was received and investigation found it unsubstantiated (TRC doc 722166, 2011).

**Fracking:** Radnor 1B was fracked in 2010 (TRC HF report, May 2012)

#### 17, 18. Cheal A Production and Deepwell Injection Site

**Location:** Mountain Road, Ngaere

**Consents:** For discharge of up to 200 m<sup>3</sup> per day of drilling mud wastes, waste drill water and produced water by deepwell injection into the (Urenui and) Mount Messenger Formation.

**Monitoring:** In 2007-09, TRC’s monitoring included 3 inspections and auditing of company information. Report explains, “Fluids can potentially be forced upward from the injection zone through transmissive faults or fractures ... which, like improperly plugged wells, can be pathways for waste migration to freshwater aquifers.” In Sep 2009, the company informed TRC of two production wells 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.

**Fracking:** Cheal A7 was fracked at 1750m depth in 2010 (TRC HF report, May 2012).

#### 19, 20. Cheal B and Mix-Bury-Cover Site

**Location:** 2 Taylor Road, Stratford

**Discharge consents:** For discharge of drilling muds, drilling cuttings and drilling wastes onto and into land via mix bury cover (MBC); stormwater and sediment from earthworks and treated stormwater and treated produced water onto and into land near Ngaere Stream in the Patea Catchment; emissions to air during flaring associated with drilling of eight new wells.

**Monitoring:** Reported a nitrogen loading of 1,120 kg which exceeded the consent limit. The failure to provide pre-disposal analyses and discharge records were also noncompliant. An inspection commented, “A soil sample was collected from the MBC area, which had been reinstated, it had good pasture cover and was back in grazing” (TRC doc 350614, 2008).

**Fracking:** Cheal B3 and BH1 were fracked at 1750m depth in 2010 (TRC HF report, May 2012).

#### 21. Cheal C Wellsite

**Location:** Brookes Road, Stratford (less than 2 km from town), in the Waingongoro catchment

**Discharge consents:** For treated stormwater onto and into land and into Mangawharawhara stream; solid drilling wastes into land; sediment and stormwater; emissions to air; also a consent to take and use water. Drilling fluids and cuttings

were disposed of off-site by contractor to disposal site at Brown Road, Waitara.

**Monitoring:** TRC’s monitoring in 2011 involved 8 inspections and concluded that the company demonstrated a high level of environmental performance and compliance. No water samples for physicochemical analysis. No biomonitoring surveys of receiving waters. No ambient air quality analyses. (TRC doc 896574, 2011).

**Fracking:** Cheal C (ex Cardiff-2A-ST1 well) was fracked three times in 2005 (TRC HF report, May 2012). More fracking has been conducted in early 2012 at Cheal C which will potentially have 10 producing wells and a production station.

#### 22. Kea Petroleum Wingrove 2 Wellsite

**Location:** Bird Road, Pukengahu

**Discharge consents:** For solid drilling wastes into land; treated stormwater into land near Waihapa Stream; emissions to air; also to take and use ground water.

**Monitoring:** No water samples for physicochemical analysis. No ambient air quality analyses. Inspections reported, “Some drilling mud from conductor excavation... dumped near perimeter drain and needed to be removed to a secure area to prevent discharge to ringdrains in event of rain... Drilling materials were onsite and need to be banded. There were some drill fluids in the mix-bury-cover pit, which would need to be removed... Need confirmation if the bulk diesel fuel tank is double skinned” (TRC doc 813316, 2011).

**Fracking:** Wingrove 2 is not listed in the TRC HF report, but MED website reported on 4 Aug 2010, “Kea Petroleum may drill more wells... depending on the success of a testing programme at Wingrove-2 using specialised fracturing techniques and downhole heating.” And “Kea planning up to 6 onshore wells from early 2011... These would include a mix of shallower oil targets like Wingrove plus deeper gas targets. Some... can be reached by deviating from the Wingrove site...” [www.nzpam.govt.nz/cms/news/](http://www.nzpam.govt.nz/cms/news/)

#### 23. Shell Todd Maui Production Station

**Location:** Tai Road, Oaonui

The station processes gas and condensate from the Maui field 33 km offshore. It supplies natural gas to the national grid. Liquefied petroleum gas (LPG) is transported off-site by road tankers. Condensate is piped to storage tanks at Omata.

**Discharge consents:** For treated stormwater, wastewater and domestic effluent to Ngapirau Stream; treated stormwater and wastewater to Oaonui Stream; emissions to air; also a consent to maintain a structure in coastal marine area.

**Monitoring:** “Hydrocarbon results complied with consent limit. STOS provided an acceptable explanation for each occasion that the suspended solids limit was exceeded... There were only 12 occasions that the glycol result was above the reporting limit of detection of 1 g/m<sup>3</sup>.” Consent 0246-3 which authorises the discharge of domestic wastewater does not specify any numerical limits for the discharge. “Faecal coliforms were elevated in the first sample but within the range of previous samples ... Water quality in Ngapirau Stream was only affected by a slight increase in faecal coliforms... due to... faecal coliforms in the oxidation pond discharge” (TRC doc 854309, 2011).



## 24. Shell Todd KA- 8/12/15 Wellsite

**Location:** Eltham Road, Kapuni

**Discharge consents:** For treated stormwater into an unnamed tributary of Inaha Stream; discharge of liquid onto and into land from a purpose built below ground pit; emissions to air. Drilling fluids, cuttings and solid drilling wastes were disposed of off-site.

**Monitoring:** One unauthorised incident, “well head cellar overflowed through to the skimmer pits and then discharged to an unnamed tributary of Inaha Stream. The Company invoked the contingency plan and took all actions necessary to prevent any effect to the waterbody. No water samples were taken as this company had cleaned up prior to inspection.” The consent includes limits for un-ionised ammonia, zinc, vanadium, total chromium 6+, total chromium 3+, total copper, etc. Yet no monitoring of the receiving environment was carried out. No air discharge monitoring either (TRC doc 780809, 2011).

## 25-33. Shell Todd Kapuni Wellsites and Production Station

**Location:** Palmer Road, Kapuni

Three flares operate continuously as a pilot flare at the station. The nearest dwelling is >300 metres from the flare stacks.

**Discharge consents:** For treated stormwater to Kapuni Stream; emissions to air. Shell Todd holds a further 31 resource consents for wellsites associated with Kapuni Production Station.

**Monitoring:** The discharge of well fluids to blow-down pits had occurred at several wellsites, some without consent. Three documented breaches at KA-1/7; one breach at KA-4/14; two breaches at KA-6/11; two breaches at KA- 8/12/15; and 4 breaches at KA-13. The groundwater in the area is not safe for drinking. No groundwater monitoring since 2008 (TRC doc 854309, 2011).

**Fracking:** Kapuni wells KA 4, 5, 6, 8, 15 and 18 were all fracked, notably KA 18 was fracked six times from May 2010 – Feb 2011 (TRC HF report, May 2012). In March and April 2012, TRC granted new consents for discharge of contaminants associated with HF for wellsites KA- 1/7/19/20, 4/14, 8/12/15/18 and 6/11/17.

## 34. Origin Rimu Production Station and Deepwell Injection Site

**Location:** Old South Road, Mokoia

**Discharge consent:** For treated stormwater onto and into land and into an unnamed tributary of Manawapou River; waste drilling fluids by deepwell injection into Matemateaonga Formation; emissions to air; take and use water. Origin holds another 36 resource consents for 19 wellsites associated with the Rimu station.

**Monitoring:** One incident at the production station in 2010: a pipeline leaked produced oil and water into a tributary of Manawapou Stream (TRC doc 1000353, 2012). Deepwell injection consents for Rimu sites were not exercised in 2003-06, but 671,013 m<sup>3</sup> of waste was discharged via Waihapā-7A into the same formation at 1126-1176m depth. At Waihapā, the formation contains freshwater to a depth of ~1029m. The report revealed that maximum injection pressures and concentration of contaminants injected were significantly higher than consent limits (TRC doc 158502, 2006).

**Fracking:** Rimu A1, A2 and A3 were fracked with diesel (not water) in 2001-2003 (TRC HF report, 2012).

## 35, 36. Origin / Geary Drilling Waste Land Treatment Site and Landfarms

**Locations:** Geary and Schrider sites on Geary Road, Manutahi; Spence Road site, Kakaramaea.

**Discharge consents:** For drilling waste, including SBM, WBM, OBM and oily waste, onto and into land via landfarming.

**Monitoring:** At Geary site, “most disposal areas comply with limits specified in the consent” although “not all areas have been tested for all parameters. Of the areas tested for hydrocarbons, further degradation of PAH in one area is still required ... to achieve compliance with the consent surrender condition.” Most areas sampled exceed Canadian Environmental Quality Guideline for barium. Many also exceeded consent limit for sodium. The site had received wastes from Kauri E2-11 wells, Kauri A, Waihapā F, Kaimiro G, Tuihu B, Surrey 1, Cheal, Honeysuckle, Taraki D and Tawa B. It has since been reinstated to dairy farmland (TRC doc 169501, 2006). At Schrider site, “...nitrogen... exceeded the limit. Previous monitoring at landfarming sites has shown that loading limits were seldom complied with. In coastal locations, adverse effects on groundwater due to leaching of chloride and nitrogen are expected to be minimal. The Council allowed landfarm operators at such sites to vary their consent conditions.” BTEX, PAH and sodium were not tested for in some areas. Spence Road site has received drilling wastes from Piakau 1 and 2, Ahuroa 1, Kauri F2 and F3, Radnor and Manutahi A. All but two areas sampled exceed Canadian Guideline for barium”. PAH and sodium were not tested for in some areas (TRC doc 829868, 2011).

**Fracking:** Nine wells at Kauri E, A1 and A4, Manutahi A1 and B1 were fracked with diesel from 2003-2005 and Radnor 1B was fracked with water in 2010 (TRC HF report, May 2012).

## 37-39. Origin Manutahi-E, F, H Wellsites

**Location:** Lower Ball Road, Kakaramaea

**Discharge consents:** For stormwater, sediment, treated stormwater and treated produced water onto and into land near Mangaroa Stream and Lake Kaihōura; emissions to air.

**Monitoring:** No report specific to Manutahi-E, F or H found on TRC website. Monitoring at Manutahi-D in 2011 involved 16 inspections. No water samples for physicochemical analysis. No biomonitoring surveys of receiving waters. No ambient air quality analyses (TRC doc 924107, 2011).

**Fracking:** Manutahi A1 and B1 were fracked with diesel at just 1157-1179m depth in 2005. (TRC HF report, May 2012).

## 40. Origin Kauri E Wellsite

**Location:** Geary Road, Manutahi

**Discharge consents:** For drill cuttings and fluids with WBM, drill cuttings from SBM and drill cuttings and oily waste from OBM onto and into land via land farming; treated stormwater, uncontaminated treated site water and uncontaminated production water into and onto land; stormwater and sediment from earthworks; emissions to air. Origin also holds discharge consents for other Kauri wellsites, several were

changed in 2010 to remove chloride and nitrogen loading limits and requirement to keep wells and waste types separate, and extend stockpiling periods.

**Monitoring:** In 2006, “site inspections confirm that the actual site was well managed and kept neat and tidy; and that the emissions and discharges were within consent limits.” Chemical sampling was not undertaken. (TRC doc 184462, 2006).

**Fracking:** Kauri E1, 2, 3, 4, 4A, 5, 7, 9 were fracked with diesel from 2003-05 (TRC HF report, May 2012).

## 41. Greymouth Hawera Landfarm

**Location:** Rifle Range Road, Hawera (Site is owned by Fonterra as part of their research farm)

**Consent:** To discharge drilling cuttings and fluids with WBM, drilling cuttings with SBM, and carbon filter sludge from Fonterra Kapuni, onto and into land via land farming.

**Monitoring:** “There appear to be no adverse environmental effects resulting from past discharges of drilling waste at the site. However, the establishment of permanent pasture over part of the site remains an issue” (TRC doc 931224, 2011).

## 42. Origin Kupe Production Station

**Location:** Inaha Road, Manaia

This station processes natural gas and light oil/condensate from the Kupe field ~30 km offshore, also owned by NZ Oil & Gas and Genesis. Natural gas supplies the main North Island transmission system. Condensate is transported to Port Taranaki for export. LPG is sold domestically.

**Consents:** To discharge stormwater and produced water into Kapuni Stream and by deepwell injection; allow disturbance and occupation of seabed and erection of pipelines; emissions into air; take and use water.

**Monitoring:** Included inspections, water samples, biomonitoring of receiving waters, and ambient air quality surveys. Results were within consent limits (TRC doc 932996, 2011).

## 43. Ballance Agri-Nutrients Ammonia Urea Plant

**Location:** 309 Palmer Road, Kapuni

It produces ammonia and urea from natural gas.

**Consents:** To take water from Waingongoro River, Kapuni Stream and groundwater; discharge to land and to Kapuni Stream; emissions into air.

**Monitoring:** Elevated nitrate concentrations in shallow groundwater, four incidents with ammonia concentration in air breaching consent limit, a leak to a stream from an underground effluent irrigation line. “Ballance demonstrated a good level of environmental performance and compliance... However, with regard to emissions to air, an improvement in the Company’s performance is desirable” (TRC doc 828908, 2011).

Information collated by Climate Justice Taranaki and concerned individuals from published documents (last updated 30 July 2012).

BTEX = Benzene, toluene, ethylbenzene, xylenes;  
HF = Hydraulic fracturing (Fracking);

OBM = Oil-based mud;

PAH = Polycyclic aromatic hydrocarbon;

SBM = Synthetic-based mud; WBM = Water-based mud;  
TRC = Taranaki Regional Council.

More information at [www.climatejusticetaranaki.info](http://www.climatejusticetaranaki.info)