

Greymouth Petroleum Ltd  
Northern Sites  
Monitoring Programme  
Annual Report  
2019-2020

Technical Report 2020-40

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## Executive summary

Greymouth Petroleum Ltd (GPL) operates the Turangi Production Station located on Turangi Road at Motunui, in the Parahaki catchment. The Turangi Production Station processes oil and gas from GPL's northern Taranaki operations, including the Ohanga, Onaero and Turangi group of wellsites. GPL also operate the Kowhai-A Production Station, located on Ngatimaru Road at Tikorangi. The Kowhai-A Production Station processes product from the Kowhai-A, B, C and D wellsites. This report for the period July 2019 to June 2020 describes the monitoring programme implemented by the Taranaki Regional Council (the Council) to assess GPL's environmental and consent compliance performance during the period under review. The report also details the results of the monitoring undertaken and assesses the environmental effects of GPL's activities.

GPL holds four resource consents in relation to the Turangi and Kowhai-A production stations, which include a total of 80 conditions setting out the requirements that GPL must satisfy. GPL holds two consents to discharge stormwater and two consents to discharge emissions related to production activities into the air. During the year under review two stormwater consents at the Turangi Production Station were surrendered after being combined, with an additional discharge, into one new consent covering the whole site.

**During the monitoring period, Greymouth Petroleum Ltd demonstrated an overall high level of environmental performance.**

The Council's monitoring programme for the year under review included three inspections of the Turangi and Kowhai-A production stations, along with an annual inspection of wellsites associated with the production stations. Thirteen water samples were collected for physicochemical analysis, two biomonitoring surveys of receiving waters were conducted, and two ambient air quality surveys were undertaken in relation to the Turangi Production Station.

The monitoring showed that the production station sites were well managed. Sampling of discharges and receiving waters in relation to Turangi Production Station did not find any significant adverse effects at the time of sampling, while biomonitoring in the receiving waters did not show any effect from discharges on the communities in the stream.

There were no adverse effects on the environment resulting from the exercise of the air discharge consent. Ambient air quality monitoring at the Turangi Production Station showed that levels of carbon monoxide, combustible gases, PM<sub>10</sub> particulates, and nitrogen oxides were all below levels of concern at the time of sampling. No offensive or objectionable odours were detected beyond the boundary during inspections.

During the year, GPL demonstrated a high level of both environmental performance and administrative compliance with the resource consents.

For reference, in the 2019-2020 year, consent holders were found to achieve a high level of environmental performance and compliance for 81% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 17% of the consents, a good level of environmental performance and compliance was achieved.

In terms of overall environmental and compliance performance by the consent holder over the last several years, this report shows that the consent holder's performance remains at a high level.

This report includes recommendations for the 2020-2021 year, including a recommendation relating to an optional review of consents 10169-1 and 10703-1.

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## 1 Introduction

### 1.1 Compliance monitoring programme reports and the Resource Management Act 1991

#### 1.1.1 Introduction

This report is for the period July 2019 to June 2020 by the Taranaki Regional Council (the Council) on the monitoring programme associated with resource consents held by Greymouth Petroleum Limited (GPL). GPL operates the Turangi Production Station situated on Turangi Road at Motunui, in the Parahaki catchment. GPL also operate the Kowhai-A Production Station situated on Ngatimaru Road at Tikorangi, in the Waiau catchment.

The report includes the results and findings of the monitoring programme implemented by the Council in respect of the consents held by GPL that relate to discharges of water within the Parahaki and Waiau catchments, and the air discharge permits held by GPL to cover emissions to air from the sites.

One of the intents of the *Resource Management Act 1991* (RMA) is that environmental management should be integrated across all media, so that a consent holder's use of water, air, and land should be considered from a single comprehensive environmental perspective. Accordingly, the Council generally implements integrated environmental monitoring programmes and reports the results of the programmes jointly. This report discusses the environmental effects of the Company's use of water, land and air, and is the 12<sup>th</sup> combined annual report by the Council for the Turangi Production Station and associated sites.

#### 1.1.2 Structure of this report

**Section 1** of this report is a background section. It sets out general information about:

- consent compliance monitoring under the RMA and the Council's obligations;
- the Council's approach to monitoring sites through annual programmes;
- the resource consents held by GPL in the Parahaki and Waiau catchments;
- the nature of the monitoring programme in place for the period under review; and
- a description of the activities and operations conducted at the sites.

**Section 2** presents the results of monitoring during the period under review, including scientific and technical data.

**Section 3** discusses the results, their interpretations, and their significance for the environment.

**Section 4** presents recommendations to be implemented in the 2020-2021 monitoring year.

A glossary of common abbreviations and scientific terms, and a bibliography, are presented at the end of the report.

#### 1.1.3 The Resource Management Act 1991 and monitoring

The RMA primarily addresses environmental 'effects' which are defined as positive or adverse, temporary or permanent, past, present or future, or cumulative. Effects may arise in relation to:

- a. the neighbourhood or the wider community around an activity, and may include cultural and social-economic effects;
- b. physical effects on the locality, including landscape, amenity and visual effects;
- c. ecosystems, including effects on plants, animals, or habitats, whether aquatic or terrestrial;

- d. natural and physical resources having special significance (for example recreational, cultural, or aesthetic); and
- e. risks to the neighbourhood or environment.

In drafting and reviewing conditions on discharge permits, and in implementing monitoring programmes, the Council is recognising the comprehensive meaning of 'effects' inasmuch as is appropriate for each activity. Monitoring programmes are not only based on existing permit conditions, but also on the obligations of the RMA to assess the effects of the exercise of consents. In accordance with Section 35 of the RMA, the Council undertakes compliance monitoring for consents and rules in regional plans, and maintains an overview of the performance of resource users and consent holders. Compliance monitoring, including both activity and impact monitoring, enables the Council to continually re-evaluate its approach and that of consent holders to resource management and, ultimately, through the refinement of methods and considered responsible resource utilisation, to move closer to achieving sustainable development of the region's resources.

#### 1.1.4 Evaluation of environmental and administrative performance

Besides discussing the various details of the performance and extent of compliance by the Company, this report also assigns them a rating for their environmental and administrative performance during the period under review.

Environmental performance is concerned with actual or likely effects on the receiving environment from the activities during the monitoring year. Administrative performance is concerned with the Company's approach to demonstrating consent compliance in site operations and management including the timely provision of information to Council (such as contingency plans and water take data) in accordance with consent conditions.

Events that were beyond the control of the consent holder and unforeseeable (that is a defence under the provisions of the RMA can be established) may be excluded with regard to the performance rating applied. For example loss of data due to a flood destroying deployed field equipment.

The categories used by the Council for this monitoring period, and their interpretation, are as follows:

##### [Environmental Performance](#)

**High:** No or inconsequential (short-term duration, less than minor in severity) breaches of consent or regional plan parameters resulting from the activity; no adverse effects of significance noted or likely in the receiving environment. The Council did not record any verified unauthorised incidents involving environmental impacts and was not obliged to issue any abatement notices or infringement notices in relation to such impacts.

**Good:** Likely or actual adverse effects of activities on the receiving environment were negligible or minor at most. There were some such issues noted during monitoring, from self reports, or during investigations of incidents reported to the Council by a third party but these items were not critical, and follow-up inspections showed they have been dealt with. These minor issues were resolved positively, co-operatively, and quickly. The Council was not obliged to issue any abatement notices or infringement notices in relation to the minor non-compliant effects; however abatement notices may have been issued to mitigate an identified potential for an environmental effect to occur.

For example:

- High suspended solid values recorded in discharge samples, however the discharge was to land or to receiving waters that were in high flow at the time;
- Strong odour beyond boundary but no residential properties or other recipient nearby.

**Improvement required:** Likely or actual adverse effects of activities on the receiving environment were more than minor, but not substantial. There were some issues noted during monitoring, from self reports, or during investigations of incidents reported to the Council by a third party. Cumulative adverse effects of a persistent minor non-compliant activity could elevate a minor issue to this level. Abatement notices and infringement notices may have been issued in respect of effects.

**Poor:** Likely or actual adverse effects of activities on the receiving environment were significant. There were some items noted during monitoring, from self reports, or during investigations of incidents reported to the Council by a third party. Cumulative adverse effects of a persistent moderate non-compliant activity could elevate an 'improvement required' issue to this level. Typically there were grounds for either a prosecution or an infringement notice in respect of effects.

### Administrative performance

**High:** The administrative requirements of the resource consents were met, or any failure to do this had trivial consequences and were addressed promptly and co-operatively.

**Good:** Perhaps some administrative requirements of the resource consents were not met at a particular time, however this was addressed without repeated interventions from the Council staff. Alternatively adequate reason was provided for matters such as the no or late provision of information, interpretation of 'best practical option' for avoiding potential effects, etc.

**Improvement required:** Repeated interventions to meet the administrative requirements of the resource consents were made by Council staff. These matters took some time to resolve, or remained unresolved at the end of the period under review. The Council may have issued an abatement notice to attain compliance.

**Poor:** Material failings to meet the administrative requirements of the resource consents. Significant intervention by the Council was required. Typically there were grounds for an infringement notice.

For reference, in the 2019-2020 year, consent holders were found to achieve a high level of environmental performance and compliance for 81% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 17% of the consents, a good level of environmental performance and compliance was achieved.<sup>1</sup>

## 1.2 Process description

### 1.2.1 Turangi Production Station

The Turangi-A wellsite production facilities were commissioned in late 2006 following the successful drilling and testing of the Turangi-1 well. Two further production wells were drilled on the wellsite in 2008. The site was expanded to the south during the 2013-2014 year. The production facilities currently treat condensate and gas from GPL's northern Taranaki operations, including the Ohanga, Onaero and Turangi group of wellsites.

The primary facilities at the Turangi Production Station consist of:

- Wellhead shutdown systems.
- Sand catcher and heating systems.
- Inlet separator and low temperature separator.

<sup>1</sup> The Council has used these compliance grading criteria for 15 years. They align closely with the 4 compliance grades in the MfE Best Practice Guidelines for Compliance, Monitoring and Enforcement, 2018

- Methanol storage and dosing system.
- A low pressure gas compressor.
- Flare system and flare pit.
- Storage tanks (condensate, methanol, and produced water) and a condensate load-out facility.

Gas is compressed, metered and exported to the national gas network. Condensate storage is located on the wellsite and currently consists of six above ground tanks and a truck load-out facility. Condensate is pumped via pipeline to the Omata tank farm, along with up to two truckloads going to the Waihapa Production Station per day. Produced formation water is stored on the site in bunded tanks prior to being pumped down the Turangi-5 well into the Mt Messenger formation for disposal.

All chemical storage is contained within bunds and isolated from the stormwater system. The stormwater drain system consists of open culverts which capture and drain general surface water run-off from the site and some surrounding farmland. Stormwater from the site passes through three sets of lined skimmer pits before discharging to land and into a tributary of the Parahaki Stream at points north and south of the access road. The separate oily water drainage system consists of a buried pipe which gathers oily water from spill containment areas (i.e. kerbed foundations and tank bunds) and directs these flows into a triple interceptor pit located near the truck loading bay. Oily water drains from the compressor house are collected in a buried fibreglass tank and are routinely pumped out into the storage tanks.



Photo 1 Turangi Production Station

### 1.2.2 Kowhai-A Production Station

The Kowhai-A Production Station (Photo 2) is located on Ngatimaru Road at Tikorangi. The site was originally developed and drilled by Swift Energy NZ Ltd in 2006. The Kowhai-A Production Station processes (separates) product from the Kowhai A, B, C and D wellsites.



Photo 2 Kowhai-A Production Station

### 1.3 Resource consents

GPL holds four resource consents, the details of which are summarised in the table below. During the year under review two stormwater consents at the Turangi Production Station were surrendered after being combined, with an additional discharge, into one new consent covering the whole site.

Summaries of the conditions attached to each permit are set out in Section 3 of this report.

A summary of the various consent types issued by the Council is included in Appendix I, as are copies of all permits held by GPL during the period under review.

Table 1 Consents held by GPL in relation to Turangi and Kowhai-A Production Stations

Site	Consent number	Purpose	Granted	Review	Expires
Turangi Production Station	6497-1	To discharge emissions to air during flaring from well workovers and in emergency situations and miscellaneous emissions associated with production activities at the Turangi Road wellsite	Dec 2004	-	June 2021
	10703-1	To discharge treated stormwater from hydrocarbon exploration and production operations at the Turangi-A Production Station, onto land and into an unnamed tributary of the Parahaki Stream and into the Parahaki Stream	Jan 2019	June 2021	June 2033
Kowhai-A Production Station	6719-1	To discharge emissions to air during flaring from well workovers and in emergency situations and miscellaneous emissions associated with production activities at the Kowhai-A wellsite	Nov 2005	-	June 2021

Site	Consent number	Purpose	Granted	Review	Expires
	10169-1	To discharge treated stormwater from hydrocarbon exploration and production operations at the Kowhai-A wellsite onto land and into an unnamed tributary of the Waiau Stream	Jan 2016	June 2021	June 2033

### 1.3.1 Wellsite consents

GPL also holds consents for production activities at wellsites associated with the Turangi and Kowhai-A production stations. A summary of these consents is provided in Table 2.

**Table 2** Consents for production activities at wellsites associated with Turangi and Kowhai-A production stations

Wellsite	Consent number	Purpose	Issue date	Expiry
Epiha	7722-1	To discharge treated stormwater, produced water and surplus drilling water from hydrocarbon exploration and production operations at the Epiha wellsite onto and into land	Nov 2010	June 2027
	7725-1	To discharge emissions to air associated with production activities at the Epiha wellsite, including flaring from well workovers, and in emergency situations, and other miscellaneous activities	Nov 2010	June 2027
Kowhai-B	9203-1	To discharge treated stormwater and produced water from hydrocarbon exploration and production operations at the Kowhai-B wellsite onto and into land	Feb 2012	June 2027
Kowhai-B	9204-1	To discharge emissions to air associated with production activities at the Kowhai-B wellsite, including: flaring associated with emergencies and maintenance; and minor emissions from other miscellaneous activities	Feb 2012	June 2027
Kowhai-C	9474-1	To discharge emissions to air associated with hydrocarbon producing wells at the Kowhai-C wellsite	Feb 2013	June 2027
	9478-1	To discharge treated stormwater, treated produced water and surplus drilling water from hydrocarbon exploration and production operations at the Kowhai-C wellsite onto and into land where it may enter an unnamed tributary of the Waiau Stream	Feb 2013	June 2027
Kowhai-D	10293-1	To discharge emissions to air associated with hydrocarbon producing wells at the Kowhai-D wellsite	Mar 2017	June 2033
	10294-1	To discharge treated stormwater from hydrocarbon exploration and production operations at the Kowhai-D wellsite onto land and into an unnamed tributary of the Waitara River	May 2016	June 2033
Main-1	7712-1	To discharge treated stormwater from hydrocarbon exploration and production operations at the Main-1 wellsite onto and into land	Jul 2015	June 2033
	7714-1	To discharge emissions to air associated with hydrocarbon producing wells at the Main-1 wellsite	Jul 2015	June 2033

Wellsite	Consent number	Purpose	Issue date	Expiry
Ohanga-A	7024-1	To discharge treated stormwater and treated produced water from hydrocarbon exploration and production operations at the Ohanga-A wellsite onto and into land and into an unnamed tributary of the Onaero River	Nov 2006	June 2021
	7025-1	To discharge emissions to air from: flaring of hydrocarbons; and miscellaneous activities associated with well clean-up, well testing, and production testing, associated with up to eight wells at the Ohanga-A wellsite	Nov 2006	June 2021
Onaero	7555-1	To discharge treated stormwater, treated produced water and treated surplus drilling water from hydrocarbon exploration and production operations onto and into land in circumstances where the discharge may enter an unnamed tributary of the Onaero River at the Onaero wellsite	Dec 2009	June 2027
	7558-1	To discharge emissions to air during flaring from well workovers and in emergency situations associated with production activities at the Onaero wellsite	Dec 2009	June 2027
Turangi-B	7853-1	To discharge treated stormwater and produced water from hydrocarbon exploration and production operations at the Turangi-B wellsite onto and into land	Jun 2011	June 2027
	7854-1	To discharge emissions to air associated with production activities at the Turangi-B wellsite, including: flaring from well workovers; flaring in emergency situations; and emissions from other miscellaneous activities	Dec 2011	June 2027
Turangi-C	9415-1	To discharge treated stormwater and produced water from hydrocarbon exploration and production operations at the Turangi-C wellsite onto land	Feb 2013	June 2027
	9420-1	To discharge emissions to air associated with hydrocarbon producing wells at the Turangi-C wellsite	Feb 2013	June 2027
Turangi Metering Station	6807-1	To discharge emissions into the air from flaring of petroleum products in emergency situations, commissioning, and plant shutdowns, together with miscellaneous emissions at the Turangi Metering Station	Sep 2006	June 2021
	6808-1	To discharge treated stormwater from the Turangi Metering Station onto and into land in the vicinity of the Waiau Stream	Mar 2006	June 2021
Urenui-1	7532-1	To discharge treated stormwater, treated surplus drilling water and treated produced water from hydrocarbon exploration and production operations at the Urenui-1 wellsite, onto land where it may enter an unnamed tributary of the Onaero River	Aug 2013	June 2027
	9631-1	To discharge emissions to air associated with hydrocarbon producing wells at the Urenui-1 wellsite	Aug 2013	June 2027

## 1.4 Monitoring programme

### 1.4.1 Introduction

Section 35 of the RMA sets obligations upon the Council to gather information, monitor and conduct research on the exercise of resource consents within the Taranaki region. The Council is also required to assess the effects arising from the exercising of these consents and report upon them.

The Council may therefore make and record measurements of physical and chemical parameters, take samples for analysis, carry out surveys and inspections, conduct investigations and seek information from consent holders.

The monitoring programme for the Turangi and Kowhai-A production station sites consisted of four primary components.

### 1.4.2 Programme liaison and management

There is generally a significant investment of time and resources by the Council in:

- ongoing liaison with resource consent holders over consent conditions and their interpretation and application;
- discussion over monitoring requirements;
- preparation for any consent reviews, renewals or new consent applications;
- advice on the Council's environmental management strategies and content of regional plans; and
- consultation on associated matters.

### 1.4.3 Site inspections

Three inspections were carried out at the Turangi and Kowhai-A production stations, along with an annual inspection of wellsites associated with the production stations. With regard to consents for the discharge to water, the main points of interest were plant processes with potential or actual discharges to receiving watercourses, including contaminated stormwater and process wastewaters. Air inspections focused on plant processes with associated actual and potential emission sources and characteristics, including potential odour, dust, noxious or offensive emissions. Sources of data being collected by the Company were identified and accessed, so that performance in respect of operation, internal monitoring, and supervision could be reviewed by the Council. The neighbourhood was surveyed for environmental effects.

### 1.4.4 Chemical sampling

Samples of the northern, southern and western discharges from Turangi Production Station were collected on two occasions during the monitoring year. These samples were analysed for chloride, conductivity, hydrocarbons, suspended solids, pH and turbidity. In conjunction, the unnamed tributary of the Parahaki Stream was sampled upstream and downstream of the northern and southern discharges, while the Parahaki Stream was sampled upstream and downstream of the western discharge. The samples were analysed for the same constituents.

The Council undertook sampling of the ambient air quality outside the boundary of the Turangi Production Station. A multi-gas meter was deployed on one occasion in the vicinity of the plant, with monitoring consisting of continuous measurements of gas concentrations for the gases of interest (carbon monoxide and combustible gases). A PM<sub>10</sub> particulate monitor was deployed concurrently with the multi-gas meter. Two nitrogen oxide measuring devices were also deployed in the vicinity of the plant on one occasion during the year under review.

#### 1.4.5 Biomonitoring surveys

A biological survey was performed on two occasions in an unnamed tributary of the Parahaki Stream to determine whether or not the discharge of treated stormwater has had a detrimental effect upon the communities of the stream.

## 2 Results

### 2.1 Water

#### 2.1.1 Inspections

During the 2019-2020 year three inspections were carried out at the Turangi and Kowhai-A production stations, along with an annual inspection of wellsites associated with the production stations. The following was found during the inspections:

##### 20 August 2019

Turangi Production Station: The site was busy with maintenance being undertaken on production facilities and rig equipment. The stormwater in the skimmer pits was very turbid and brown, however discharge valves were closed and no discharge was occurring. The in-ground sediment trap near the site entrance appeared to be effective in capturing silt. Some staining was noted around the rig equipment in areas where staff had been working. No visual effects were noted in the receiving waters downstream of the site. A heat haze was noted at the flare pit with no smoke observed.

Kowhai-A Production Station: The site was clean and tidy and no obvious stains or spills were noted on the ground. The tank bunds were empty and the ring drains were free of stormwater. The skimmer pits were slightly turbid but these were not discharging at the time of inspection. No visible heat haze or smoke was noted at the flare pit.

##### 26 September 2019

Turangi Production Station: It was noted that some scouring was occurring on the stream bank below the rock channel. It appeared that this scouring was new and was a result of the stormwater flow from site. The consent holder was asked to undertake works to ensure the scouring is prevented. Flaring had occurred earlier in the day but there was no flaring at the time of inspection.

Kowhai-A Production Station: The site was tidy. The bunds were dry with no effects noted in the ring drain. Ponding was not evident on site. No spills or stains were observed. The skimmer pits were slightly turbid but there were no discharges from site. No flaring was occurring at the time of the inspection.

##### 5 February 2020

An annual inspection of the well sites associated with the Turangi and Kowhai-A Production Stations was carried out to check for compliance with resource consent conditions. The well sites inspected were Turangi-C, Kowhai-B, C and D, Onaero, Ohanga, Epiha, and Urenui. In general, the sites were tidy and clean with minimal activity occurring. The sites were being maintained, with weed spraying evident on the site and in some places within the ring drains. The majority of ring drains were vegetated with grasses that helped with controlling and treating sediment laden stormwater. Other sediment controls in place included rock weirs and silt fences within the ring drain. Hydrocarbon sheens were not observed in the skimmer pits or in puddles on any of the sites. The skimmer pits were all in good order with goose neck pipes functioning as required. Some pits were unlined and empty. No effects were noted in the grass (such as burnt patches or dead grass) or within the streams.

Flaring from the sites was not occurring at the time of inspection. No visual effects were noted as a result of any previous flaring.

Specific points to note and if applicable, action, were:

Onaero wellsite: The Onaero wellsite had been extended and the new ring drain contours were not clearly defined, the consent holder was advised to check this.

Ohanga wellsite: Site works had been carried out at the entrance to Ohanga to ensure all stormwater was directed to the ring drain, however ponding was noted in the ring drain in the southern corner.

Kowhai-B wellsite: Flax that was growing into the ring drain had been removed and the ring drain had been redefined. It was noted that the ring drain behind the gabion basket at Kowhai-B also needed maintenance.

**27 May 2020**

Turangi and Kowhai-A production stations: Both sites were neat and tidy. Systems in place to treat and control discharges to air, land and water appeared to be working well and no issues or concerns were raised at the time of inspection.

## 2.1.2 Results of discharge monitoring



**Figure 1** Turangi Production Station and associated sampling sites

Chemical water quality sampling of the discharges from the Turangi Production Station was undertaken twice during the 2019-2020 period, on 23 August 2019 and 25 May 2020. The locations of the sampling sites are shown in Figure 1, while Table 3 presents the results.

The results are indicative of uncontaminated discharges, with the results for the majority of parameters well within the consent limits. At 145 g/m<sup>3</sup> suspended solids exceeded the consent limit in the western discharge (STW002101) on 23 August 2019. This did not appear to adversely affect the stream with no visual change in colour or clarity observed and no change in suspended solids measured from upstream to below the mixing zone downstream (Table 5, both 5 g/m<sup>3</sup>).

Table 3 Results of discharge monitoring from the Turangi Production Station

Parameter	Units	23 August 2019			25 May 2020			Consent limits (10703-1)
		Northern discharge IND00203 5	Southern discharge IND00205 2	Western discharge STW00210 1	Northern discharge IND00203 5	Southern discharge IND00205 2	Western discharge STW00210 1	
Chloride	g/m³	-	5	10	4	4	4	230
Conductivity	mS/m @25°C	-	4.2	7.1	3.0	3.3	3.4	-
Hydrocarbons	g/m³	-	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	15
Suspended solids	g/m³	-	32	145	7	9	8	100
Temperature	Deg. C	-	10.1	9.6	14.8	14.0	15.2	-
pH		-	7.0	7.0	7.3	7.4	7.5	6.0 – 9.0
Turbidity	FNU	-	28	161	4.9	6.6	6.8	-

## 2.1.3 Results of receiving environment monitoring

### 2.1.3.1 Chemical

Chemical water quality sampling of the receiving environment was undertaken in conjunction with discharge monitoring. The results of receiving environment monitoring in relation to the northern (IND002035) and southern (IND002052) discharges are presented in Table 4 below. The results complied with consent conditions and indicate that the discharge was having minimal effect on the water quality of the tributary of the Parahaki Stream at the times of sampling.

Table 4 Results of receiving environment monitoring in relation to the northern and southern discharges

Parameter	Units	Consent limits 10703-1	23 August 2019		25 May 2020	
			Upstream PRH000020	Downstream PRH000022	Upstream PRH000020	Downstream PRH000022
Chloride	g/m³	50	18	18	21	21
Conductivity	mS/m@25°C	-	15.4	15.2	19.4	18.5
Hydrocarbons	g/m³	-	< 0.7	< 0.7	< 0.7	< 0.7
pH		-	7.0	6.7	7.2	7.2
Suspended solids	g/m³	-	4	5	6	6
Temperature	Deg. C	<2°C increase	12.2	12.2	14.0	14.2
Turbidity	FNU	-	2.5	3.2	3.4	3.8

The results of receiving environment monitoring in relation to the western (STW002101) discharge are presented in Table 5 below. The results complied with consent conditions and indicate that the discharge was having minimal effect on the water quality of the Parahaki Stream at the times of sampling.

Table 5 Results of receiving environment monitoring in relation to the western discharge

Parameter	Units	Consent limits 10703-1	23 August 2019		25 May 2020	
			Upstream PRH000026	Downstream PRH000027	Upstream PRH000026	Downstream PRH000027
Chloride	g/m <sup>3</sup>	50	19	19	22	22
Conductivity	mS/m@25°C	-	14.0	14.1	17.8	17.7
Hydrocarbons	g/m <sup>3</sup>	-	< 0.7	< 0.7	< 0.7	< 0.7
pH		-	7.0	7.2	7.3	7.0
Suspended solids	g/m <sup>3</sup>	-	5	5	12	15
Temperature	Deg. C	<2°C increase	11.9	12.0	13.9	13.9
Turbidity	FNU	-	3.1	3.6	6.0	4.6

### 2.1.3.2 Biomonitoring



Figure 2 Biomonitoring sites in relation to the Turangi Production Station

**Table 6 Biomonitoring sites in relation to the Turangi Production Station**

Site number	Site code	Location
1	PRH000020	Upstream of Turangi Production Station discharge
2	PRH000022	25 m downstream of Turangi Production Station discharge
3	PRH000024	100 m downstream of Turangi Production Station discharge

The Councils 'vegetation sweep' and 'kick-sampling' techniques were used at three sites (Figure 2, Table 6) to collect macroinvertebrates from an unnamed tributary of the Parahaki Stream on 7 November 2019 and 2 March 2020. This provided data to assess whether discharges to nearby land had had any effect on the macroinvertebrate communities of the unnamed tributary. Samples were processed to provide number of taxa (richness), MCI, and SQMCI scores for each site.

Taxa richness is the most robust index when determining whether a macroinvertebrate community has been exposed to toxic discharges. When exposed to toxic discharges, macroinvertebrates may die and be swept downstream or may deliberately drift downstream as an avoidance mechanism (catastrophic drift). In general, taxa richness was low at the three sites surveyed in the unnamed tributary of the Parahaki Stream. However, there was no evidence of any acute toxic discharges, which may dramatically lower taxa richness.

The MCI is a measure of the overall sensitivity of the macroinvertebrate community to the effects of organic pollution in stony streams. It is based on the presence/absence of taxa with varying degrees of sensitivity to environmental conditions. MCI scores categorised sites 1 and 2 as having 'poor' macroinvertebrate community health and site 3 as having 'very poor' health. However there were no significant differences in MCI scores between 'control' site 1 and the primary and secondary impact sites 2 and 3.

The SQMCI takes into account taxa abundances as well as sensitivity to pollution. It may indicate subtle changes in communities, and therefore be the more relevant index if non-organic impacts are occurring. However, it is also influenced by the 'patchiness' of macroinvertebrates on the streambed, and as such must be considered in the context of all three metrics. SQMCI scores indicated 'poor' or 'very poor' macroinvertebrate health at all sites during the surveys. During the spring survey there were no significant differences observed between all three sites, while in the autumn survey no significant differences were recorded between sites 2 and 3, while the SQMCI score recorded at site 1 (control) was significantly lower than those recorded downstream at sites 2 and 3.

The results of the two surveys indicated that the macroinvertebrate communities of the unnamed tributary of the Parahaki Stream were in generally typical health at all three sites. Overall, the results of the surveys provided no evidence that discharges from the Turangi Production Station had any significant detrimental impacts on the stream macroinvertebrate communities.

Copies of biomonitoring reports for this site are available from the Council upon request.

## 2.2 Air

### 2.2.1 Inspections

Air inspections were carried out in conjunction with site inspections as discussed in Section 2.1.1 above. No issues regarding air quality were noted during the monitoring year.

## 2.2.2 Results of abstraction and discharge monitoring

### 2.2.2.1 Carbon monoxide and combustible gases

During the monitoring year, a multi-gas meter was deployed on one occasion in the vicinity of the plant. The deployment lasted approximately 68 hours, with the instrument placed in a down-wind position at the start of the deployment. Monitoring consisted of continuous measurements of gas concentrations for the gases of interest (carbon monoxide and combustible gases). The monitoring sites used in the year under review are shown in Figure 3.



Figure 3 Air monitoring sites at Turangi Production Station for 2019-2020

Because of the nature of the activities on the site, it was considered that the primary information of interest in respect of gases potentially emitted from the site was the average downwind concentration, rather than any instantaneous peak value. That is, the long-term exposure levels, rather than short-term maxima, are of most interest. The gas meter was therefore set up to create a data set based on recording the average concentration measured during each minute as raw data. The details of the sample run are summarised in Table 7 and the data from the sample run are presented graphically in Figure 4.

Table 7 Results of carbon monoxide and LEL monitoring at Turangi Production Station

Period (from-to)		9 to 12 Jan 2020 (68 hours)
Max	CO(ppm)	15.6
	LEL(%)	0.20
Mean	CO(ppm)	0.13
	LEL(%)	0.00
Min	CO(ppm)	0.00
	LEL(%)	0.00

Notes: (1) the instrument records in units of ppm. At 25°C and 1 atm, 1ppm CO = 1.145 mg/m<sup>3</sup>

(2) because the LEL of methane is equivalent to a mixture of approximately 5% methane in air, then the actual concentration of methane in air can be obtained by dividing the percentage LEL by 20.

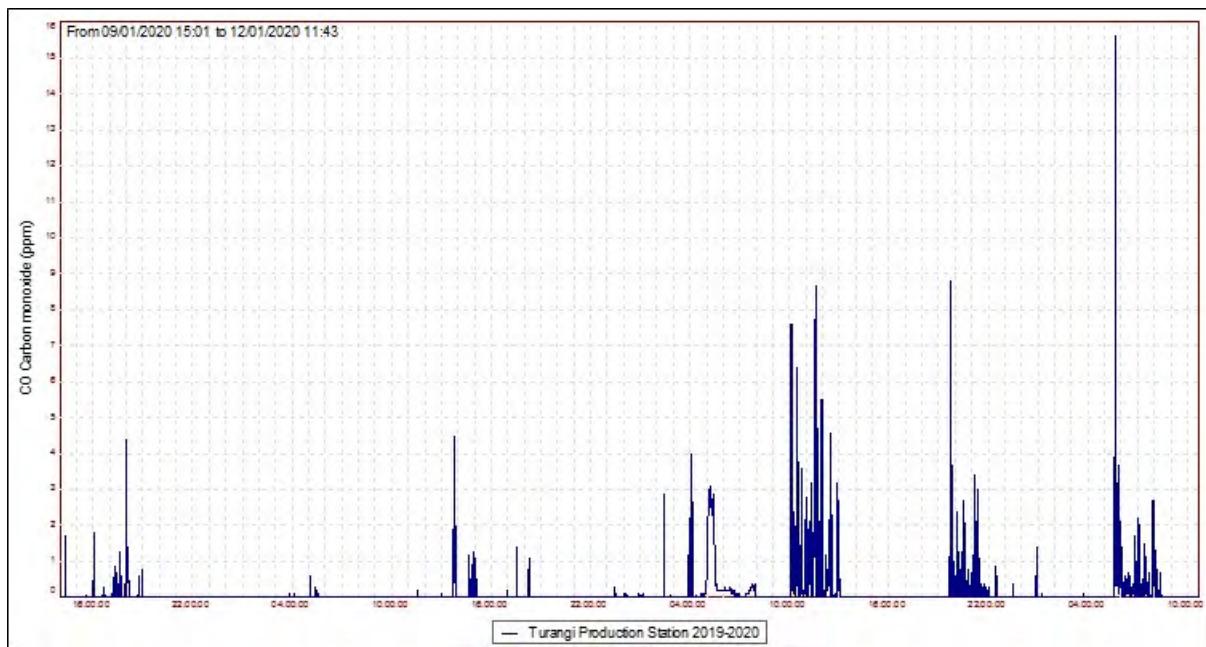


Figure 4 Ambient CO levels in the vicinity of Turangi Production Station

The consent covering air discharges from the Turangi Production Station has specific limits related to particular gases. Special condition 18 of consent 6497-1 sets a limit on the carbon monoxide concentration at or beyond the production station's boundary. The limit is expressed as 10 mg/m<sup>3</sup> for an eight hour average or 30 mg/m<sup>3</sup> for a one hour average exposure. The maximum concentration of carbon monoxide found during the monitoring run was 17.9 mg/m<sup>3</sup> while the average concentration for the entire dataset was 0.15 mg/m<sup>3</sup> which comply with consent conditions. This is consistent with the pattern found in previous years.

Lower Explosive Limit (LEL) gives the percentage of the lower explosive limit, expressed as methane that is detected in the air sampled. The sensor on the instrument reacts to gases and vapours such as acetone, benzene, butane, methane, propane, carbon monoxide, ethanol, and higher alkanes and alkenes, with varying degrees of sensitivity. The Council's Regional Air Quality Plan has a typical requirement that no discharge shall result in dangerous levels of airborne contaminants, including any risk of explosion. At no time did the level of explosive gases downwind of the Turangi Production Station reach any more than a trivial level.

#### 2.2.2.2 PM<sub>10</sub> particulates

In September 2004 the Ministry for the Environment enacted National Environmental Standards (NESs) relating to certain air pollutants. The NES for PM<sub>10</sub> particulates is 50 µg/m<sup>3</sup> (24 hour average).

Particulates can be derived from many sources, including motor vehicles (particularly diesel), solid and oil-burning processes for industry and power generation, incineration and waste burning, photochemical processes, and natural sources such as pollen, abrasion, and sea spray.

PM<sub>10</sub> particles are linked to adverse health effects that arise primarily from the ability of particles of this size to penetrate the defences of the human body and enter deep into the lungs, significantly reducing the exchange of gases across the lung walls. Health effects from inhaling PM<sub>10</sub> include increased mortality and the aggravation of existing respiratory and cardiovascular conditions such as asthma and chronic pulmonary diseases.

During the reporting period, a DustTrak PM<sub>10</sub> monitor was deployed on one occasion in the vicinity of Turangi Production Station. The deployment lasted approximately 69 hours, with the instrument placed in a down-wind position at the start of the deployment. Monitoring consisted of continual measurements of

PM<sub>10</sub> concentrations. The location of the DustTrak monitor during the sampling run is shown in Figure 2. The results of the sample run are presented in Figure 5 and Table 8.

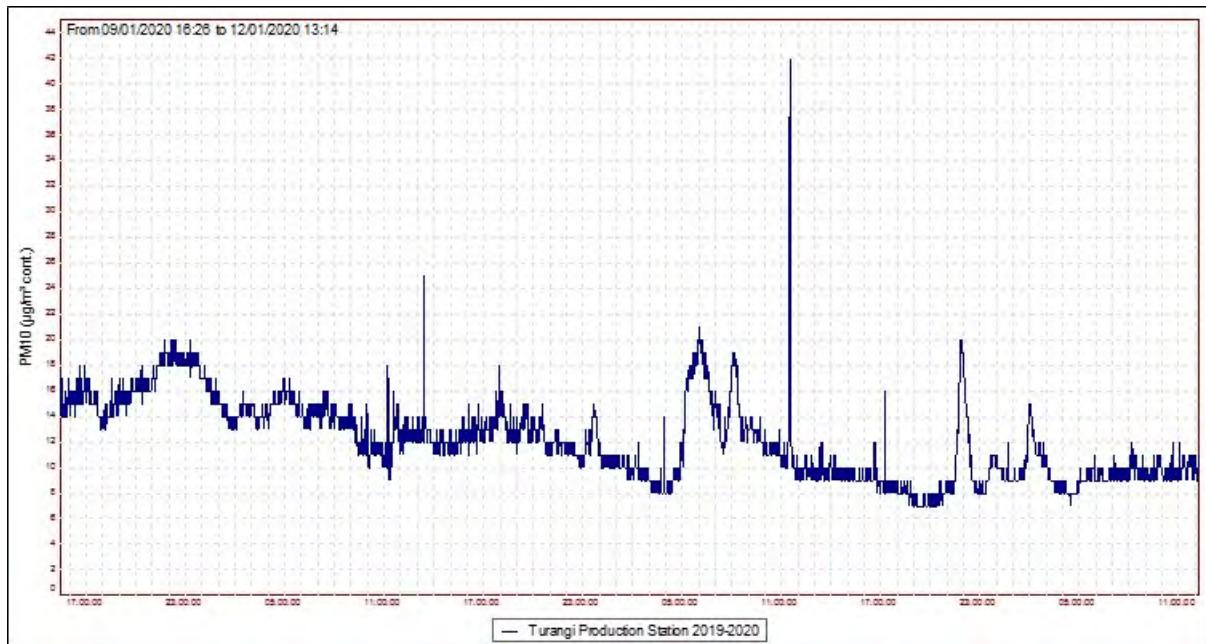


Figure 5 PM<sub>10</sub> concentrations (µg/m<sup>3</sup>) at Turangi Production Station

Table 8 Daily averages of PM<sub>10</sub> results from monitoring at Turangi Production Station

	9 to 12 January 2020 (69 hours)		
24 hr. set	Day 1	Day 2	Day 3
Daily average	14.6 µg/m <sup>3</sup>	12.0 µg/m <sup>3</sup>	9.5 µg/m <sup>3</sup>
NES	50µg/m <sup>3</sup>		

During the 69 hour run, from 9 to 12 January 2020, the average recorded PM<sub>10</sub> concentration was 14.6 µg/m<sup>3</sup> for the first, 12.0 µg/m<sup>3</sup> for the second and 9.5 µg/m<sup>3</sup> for the third 24 hour period. These daily averages equate to 29%, 24% and 19%, respectively, of the 50 µg/m<sup>3</sup> value that is set by the NES. Background levels of PM<sub>10</sub> in the region have been found to be typically around 11 µg/m<sup>3</sup>.

### 2.2.2.3 Nitrogen oxides

From 2014 onwards, the Council implemented a coordinated region-wide compliance monitoring programme to measure nitrogen oxides (NOx). The programme involves deploying measuring devices at 24 NOx monitoring sites (including two sites in the vicinity of Turangi Production Station) on the same day, with retrieval three weeks later. This approach assists the Council in further evaluating the effects of local and regional emission sources and ambient air quality in the region.

The consent covering air discharges from the Turangi Production Station has specific limits related to particular gases. Special condition 19 of consent 6497-1 sets a limit on the nitrogen dioxide concentration at or beyond the production station's boundary. The limit is expressed as 200 µg/m<sup>3</sup> for a one hour average or 100 µg/m<sup>3</sup> for a 24 hour average exposure.

NOx passive adsorption discs were placed at two locations in the vicinity of the Turangi Production Station on one occasion during the year under review. The discs were left in place for a period of 21 days. The calculated one hour and 24 hour theoretical maximum NOx concentrations found at Turangi Production

Station during the year under review equate to  $37.3 \mu\text{g}/\text{m}^3$  and  $19.7 \mu\text{g}/\text{m}^3$ , respectively. The results show that the ambient ground level concentration of NOx is well below the limits set out by consent 6497-1.

Copies of the full air reports are available from the Council upon request.

### 2.2.3 Summary of flaring volumes reported by GPL

At Turangi Production Station flaring occurred each month during the year, with the quantities of gas flared at the production station relating to things like plant shutdown, gas compressor issues, plant or well restarts and power cuts. The total volume flared during the monitoring period was approximately  $270,233 \text{ m}^3$ , a large decrease compared with the 2018-2019 year of  $950,850 \text{ m}^3$ . The higher volume of flaring in May 2020 was due to part of the production station being shut down for an annual service (Figure 6).

The Turangi-B wellsite is connected to Turangi Production Station however flaring was undertaken at the wellsite in relation to well testing. There was no flaring at any of the other wellsites associated with the Turangi Production Station as these were either connected to the production station or not producing during the monitoring period.

The total volume of gas flared at the Kowhai-A Production Station during the period was approximately  $45,510 \text{ m}^3$ . Small amounts of flaring occurred in most months, with the higher amount flared in May 2020 mostly due to a plant purge and start up (Figure 7). No complaints were received from the public in relation to flaring at this site.

The Kowhai-D wellsite is connected to Kowhai-A Production Station, however some flaring was undertaken in relation to well testing under consent 10292-1. No flaring occurred at Kowhai-B or C during the year.

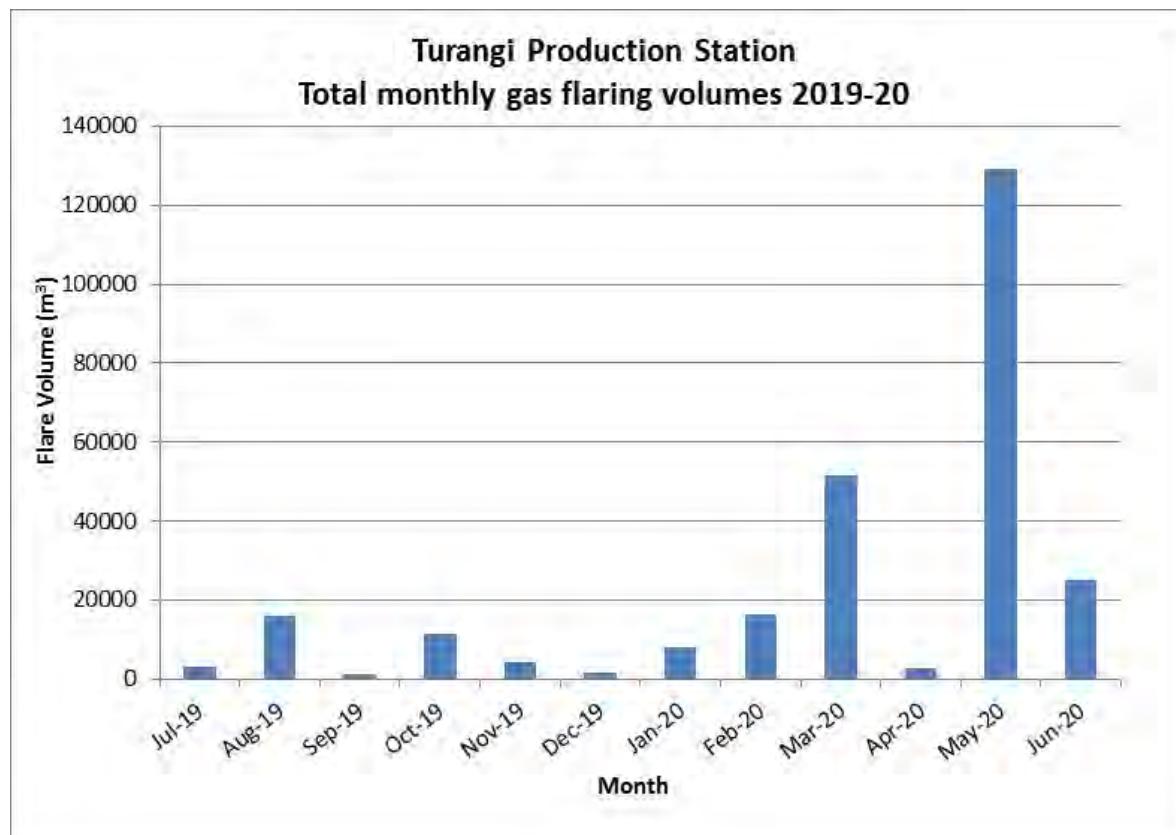


Figure 6 Summary of monthly gas flaring volumes at Turangi Production Station

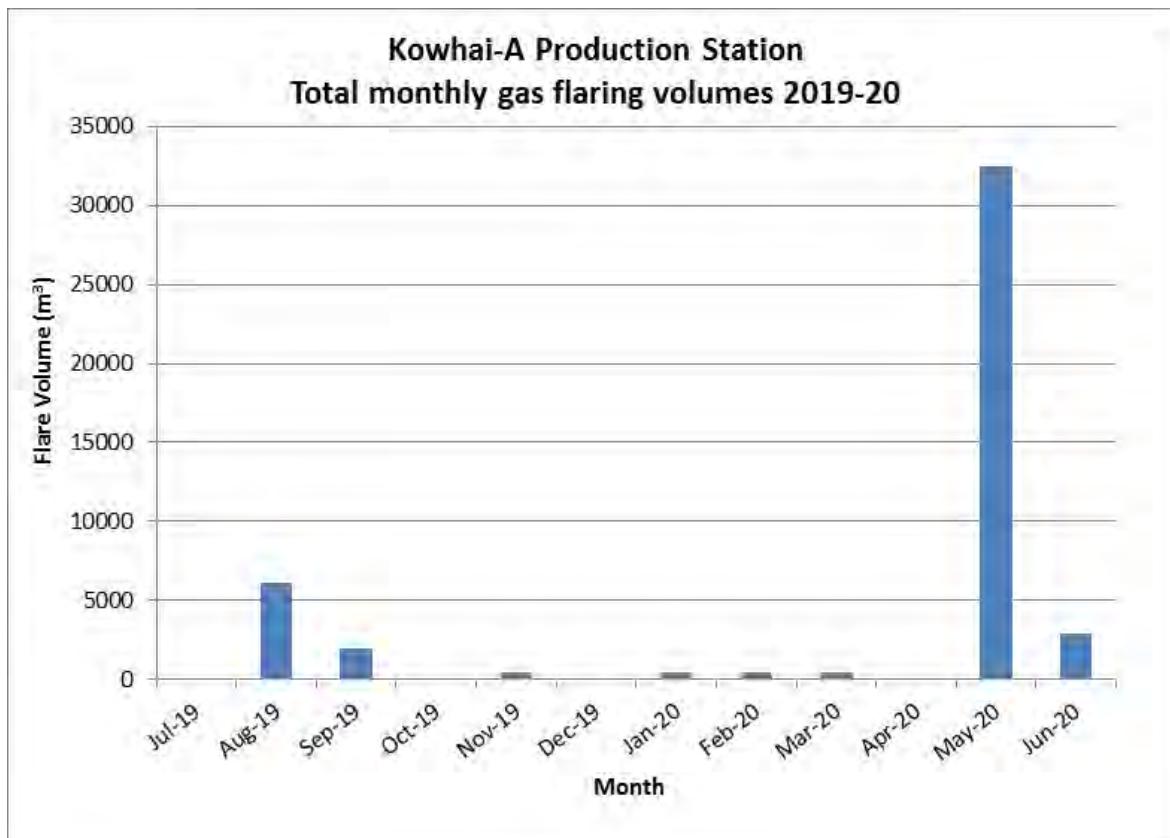


Figure 7 Summary of monthly gas flaring volumes at Kowhai-A Production Station

## 2.3 Incidents, investigations, and interventions

The monitoring programme for the year was based on what was considered to be an appropriate level of monitoring, review of data, and liaison with GPL. During the year matters may arise which require additional activity by the Council, for example provision of advice and information, or investigation of potential or actual causes of non-compliance or failure to maintain good practices. A pro-active approach, that in the first instance avoids issues occurring, is favoured.

For all significant compliance issues, as well as complaints from the public, the Council maintains a database record. The record includes events where the individual/organisation concerned has itself notified the Council. Details of any investigation and corrective action taken are recorded for non-compliant events.

Complaints may be alleged to be associated with a particular site. If there is potentially an issue of legal liability, the Council must be able to prove by investigation that the identified individual/organisation is indeed the source of the incident (or that the allegation cannot be proven).

In the 2019-2020 period, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with the Company's conditions in resource consents or provisions in Regional Plans.

## 3 Discussion

### 3.1 Discussion of site performance

Monitoring of the Turangi and Kowhai-A production stations during the 2019-2020 year found that the sites were generally well managed with no significant issues noted during inspections.

### 3.2 Environmental effects of exercise of consents

Site inspections found that the stormwater systems were constructed and maintained in accordance with consent conditions. Sampling of discharges and receiving waters did not find any significant adverse effects at the time of sampling. Biomonitoring in the receiving waters did not show any effect from discharges on the communities in the stream.

There were no adverse effects on the environment resulting from the exercise of the air discharge consent. The ambient air quality monitoring at the site showed that levels of carbon monoxide, combustible gases, PM<sub>10</sub> particulates, and nitrogen oxides were all below levels of concern at the time of sampling. No offensive or objectionable odours were detected beyond the boundary during inspections and there were no complaints in relation to air emissions from the site.

### 3.3 Evaluation of performance

A tabular summary of the consent holder's compliance record for the year under review is set out in Tables 9-14.

**Table 9 Summary of performance for consent 6497-1**

<b>Purpose: To discharge emissions to air during flaring from well workovers and in emergency situations and miscellaneous emissions associated with production activities at the Turangi Road wells site</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Flare pit to be lined	Inspection	Yes
2. Flaring shall occur at the designated location	Inspection	Yes
3. Temporary flare pit to be removed upon completion of the new flare pit	Inspection	Yes
4. Notification to Council one month prior to production operations	Production operations commenced early 2006	N/A
5. Notification to neighbours 24 hrs prior to flaring & record of complaints	Inspection and liaison with consent holder	Yes
6. Notification to Council 24 hrs prior to flaring	Notifications received	Yes
7. No alterations without approval	Inspection and liaison with consent holder	Yes
8. Take into account wind speed & direction when flaring	Inspection and Company records	Yes
9. Effective separation to minimise smoke	Inspection and Company records	Yes

**Purpose: To discharge emissions to air during flaring from well workovers and in emergency situations and miscellaneous emissions associated with production activities at the Turangi Road wells site**

Condition requirement	Means of monitoring during period under review	Compliance achieved?
10. Notification to Council of ineffective separation	No incidents during year under review	N/A
11. No liquid or solid hydrocarbons flared	Inspection and liaison with consent holder	Yes
12. Only substances from well stream to be flared	Inspection and Company records	Yes
13. Adoption of the best practicable option	Inspection and liaison with consent holder	Yes
14. No hazardous/toxic/noxious contaminants beyond boundary	Inspection and air monitoring	Yes
15. No offensive odour or smoke beyond boundary	Inspection	Yes
16. Hydrocarbon storage vessels to have vapour recovery systems	Inspection	Yes
17. Specified opacity for smoke emissions	Not assessed	N/A
18. Control of carbon monoxide emissions	Air monitoring	Yes
19. Control of nitrogen oxide emissions	Air monitoring	Yes
20. Control of emissions to achieve specified contaminant concentrations	Air monitoring	Yes
21. Keep & maintain record of smoke emitting incidents	Inspection and annual flaring report	Yes
22. Keep & maintain flaring log	Inspection and annual flaring report	Yes
23. Monthly flaring information supplied	Information received	Yes
24. Provision of annual flaring & air emissions report during May	Received	Yes
25. Analysis of typical gas and crude oil stream	Analysis not requested	N/A
26. Lapse provision	Consent exercised	N/A
27. Optional review provision	No further option for review prior to expiry in June 2021	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

Table 10 Summary of performance for consent 6719-1

<b>Purpose: To discharge emissions to air during flaring from well workovers and in emergency situations and miscellaneous emissions associated with production activities at the Kowhai-A wells site</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Notification to Council one month prior to production operations	Production operations commenced early 2006	N/A
2. Notification to neighbours 24 hrs prior to flaring & record of complaints	Inspection and liaison with consent holder	Yes
3. Notification to Council 24 hrs prior to flaring	Notifications received	Yes
4. No alterations without approval	Inspection and liaison with consent holder	Yes
5. Take into account wind speed & direction when flaring	Inspection and Company records	Yes
6. Effective separation to minimise smoke	Inspection and Company records	Yes
7. Notification to Council of ineffective separation	No incidents during year under review	N/A
8. No liquid or solid hydrocarbons flared	Inspection and liaison with consent holder	Yes
9. Only substances from well stream to be flared	Inspection and Company records	Yes
10. Adoption of the best practicable option	Inspection and liaison with consent holder	Yes
11. No hazardous/toxic/noxious contaminants beyond boundary	Inspection	Yes
12. No offensive odour or smoke beyond boundary	Inspection	Yes
13. Hydrocarbon storage vessels to have vapour recovery systems	Inspection	Yes
14. Specified opacity for smoke emissions	Not assessed	N/A
15. Control of carbon monoxide emissions	Not assessed	N/A
16. Control of nitrogen oxide emissions	Not assessed	N/A
17. Control of emissions to achieve specified contaminant concentrations	Not assessed	N/A
18. Keep & maintain record of smoke emitting incidents	Inspection and annual flaring report	Yes
19. Keep & maintain flaring log	Inspection and annual flaring report	Yes
20. Provision of annual flaring & air emissions report during May	Received	Yes

<b>Purpose: To discharge emissions to air during flaring from well workovers and in emergency situations and miscellaneous emissions associated with production activities at the Kowhai-A wellsite</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
21. Analysis of typical gas and crude oil stream	Analysis not requested	N/A
22. Lapse provision	Consent exercised	N/A
23. Optional review provision	No further option for review prior to expiry	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

**Table 11 Summary of performance for consent 10169-1**

<b>Purpose: To discharge treated stormwater from hydrocarbon exploration and production operations at the Kowhai-A wellsite onto land and into an unnamed tributary of the Waiau Stream</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Adoption of the best practicable option	Inspection and liaison with consent holder	Yes
2. Maximum stormwater catchment area	Inspection and company records	Yes
3. Notification to Council five days prior to site works and well drilling	No site works or well drilling during the monitoring period	Yes
4. Approved contingency plan	Plan up-to-date	Yes
5. Design, management and maintenance of stormwater system in accordance with application	Inspection	Yes
6. All stormwater discharged through treatment system without ponding	Inspection	Yes
7. Minimum skimmer pit capacity and ability to retain hydrocarbons	Inspection and company records	Yes
8. Stormwater retention areas to be lined with a shut off valve	Inspection and company records	Yes
9. Stormwater system to be installed prior to commencing any site works	System installed	Yes
10. Concentrations not to be exceeded in the discharge	Not assessed in year under review	N/A
11. Discharge not to cause an increase of more than 0.5 pH units beyond the mixing zone	Not assessed in year under review	N/A
12. Limitation on effects beyond the mixing zone	Not assessed in year under review	N/A

<b>Purpose: To discharge treated stormwater from hydrocarbon exploration and production operations at the Kowhai-A wellsite onto land and into an unnamed tributary of the Waiau Stream</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
13. Effects not to be caused in receiving waters	Inspections	Yes
14. 48 hrs notice prior to reinstatement	Site still active	N/A
15. Lapse provision	Consent exercised	N/A
16. Optional review provision	Next option for review in 2021, recommendation attached in Section 3.6	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

**Table 12 Summary of performance for consent 10703-1**

<b>Purpose: To discharge treated stormwater from hydrocarbon exploration and production operations at the Turangi-A Production Station, onto land and into an unnamed tributary of the Parahaki Stream and into the Parahaki Stream</b>		
<b>Condition requirement</b>	<b>Means of monitoring during period under review</b>	<b>Compliance achieved?</b>
1. Adoption of the best practicable option	Inspection and liaison with consent holder	Yes
2. Stormwater to be collected and discharged through skimmer pits	Inspection	Yes
3. Notification to Council 5 days prior to site works and well drilling	No site works or well drilling during the monitoring period	Yes
4. Approved contingency plan	Plan up-to-date	Yes
5. Design, management and maintenance of stormwater system in accordance with application documentation	Inspection and liaison with consent holder	Yes
6. All discharges to flow to perimeter drain and skimmer pit	Inspection	Yes
7. Skimmer pits to be lined and have a shut off valve	Inspection	Yes
8. Concentrations not to be exceeded in the discharge	Water sampling	<b>Mostly – suspended solids exceeded in one sample at one site</b>
9. Limits on pH of receiving waters if pH is increased in skimmer pits due to photosynthetic activity	Water sampling	Yes

**Purpose: To discharge treated stormwater from hydrocarbon exploration and production operations at the Turangi-A Production Station, onto land and into an unnamed tributary of the Parahaki Stream and into the Parahaki Stream**

Condition requirement	Means of monitoring during period under review	Compliance achieved?
10. Concentrations not to be exceeded in the receiving waters	Water sampling	Yes
11. No effects upon surface water bodies	Inspection and biomonitoring	Yes
12. 48 hrs notice prior to reinstatement	Site still active	N/A
13. Lapse provision	Consent exercised	N/A
14. Optional review provision	Next option for review in June 2021, recommendation attached in Section 3.6	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		<b>High</b>
Overall assessment of administrative performance in respect of this consent		<b>High</b>

N/A = not applicable

**Table 13 Evaluation of environmental performance over time**

Year	Consent no	High	Good	Improvement req	Poor
2009-10	6497-1	1		-	-
	6498-1	-	1	-	-
2010-11	6497-1	1	-	-	-
	6498-1	1	-	-	-
2011-12	6497-1	1	-	-	-
	6498-1	-	1	-	-
2012-14	6497-1	1	-	-	-
	6498-1	-	1	-	-
2014-15	6497-1	1	-	-	-
	6498-1	-	1	-	-
	9674-1	-	1	-	-
2015-16	6497-1	1	-	-	-
	6498-1	1	-	-	-
	9674-1	1	-	-	-
2016-17	6497-1	1	-	-	-
	6498-1	1	-	-	-
	9674-1	1	-	-	-

Year	Consent no	High	Good	Improvement req	Poor
2017-18	6497-1	1	-	-	-
	6498-1	1	-	-	-
	9674-1	1	-	-	-
2018-19	6497-1	1	-	-	-
	6498-1	1	-	-	-
	6719-1	1	-	-	-
	9674-1	1	-	-	-
	10169-1	1	-	-	-
	10703-1	1	-	-	-
Totals		21	5	-	-

During the year, GPL demonstrated a high level of both environmental performance and administrative compliance with the resource consents as defined in Section 1.1.4. The Turangi and Kowhai-A production stations and associated wellsites were well managed and maintained.

### 3.4 Recommendations from the 2018-2019 Annual Report

In the 2018-2019 Annual Report, it was recommended:

1. THAT in the first instance, monitoring of consented activities at the Turangi and Kowhai-A production stations and associated wellsites in the 2019-2020 year be amended from that undertaken in 2018-2019, by reducing the number of inspections from six per year to four.
2. THAT should there be issues with environmental or administrative performance in 2019-2020, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

Recommendation one was implemented, while it was not considered necessary to undertake additional investigation or monitoring as per recommendation two.

### 3.5 Alterations to monitoring programmes for 2020-2021

In designing and implementing the monitoring programmes for air/water discharges in the region, the Council has taken into account:

- the extent of information already made available through monitoring or other means to date;
- its relevance under the RMA;
- the Council's obligations to monitor consented activities and their effects under the RMA;
- the record of administrative and environmental performances of the consent holder; and
- reporting to the regional community.

The Council also takes into account the scope of assessments required at the time of renewal of permits, and the need to maintain a sound understanding of industrial processes within Taranaki exercising resource consents.

It is proposed that for 2020-2021 the programme remains unchanged from 2019-2020.

It should be noted that the proposed programme represents a reasonable and risk-based level of monitoring for the sites in question. The Council reserves the right to subsequently adjust the programme from that initially prepared, should the need arise if potential or actual non-compliance is determined at any time during 2020-2021.

### 3.6 Exercise of optional review of consent

Resource consents 10169-1 and 10703-1 provide for an optional review of the consents in June 2021. Conditions 16 and 14, respectively, allow the Council to review the consent for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment.

Based on the results of monitoring in the year under review, and in previous years as set out in earlier annual compliance monitoring reports, it is considered that there are no grounds that require a review to be pursued.

## 4 Recommendations

1. THAT in the first instance, monitoring of consented activities at the Turangi and Kowhai-A production stations and associated wellsites in the 2019-2020 year be amended from that undertaken in 2018-2019, by reducing the number of inspections from six per year to four.
2. THAT should there be issues with environmental or administrative performance in 2019-2020, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.
3. THAT the option for a review of resource consents 10169-1 and 10703 in June 2021, as set out in conditions of the consents, not be exercised, on the grounds that the current conditions are adequate.

## Glossary of common terms and abbreviations

The following abbreviations and terms may be used within this report:

Biomonitoring	Assessing the health of the environment using aquatic organisms.
Bund	A wall around a tank to contain its contents in the case of a leak.
CO	Carbon monoxide
Conductivity	Conductivity, an indication of the level of dissolved salts in a sample, usually measured at 25°C and expressed in mS/m.
g/m <sup>2</sup> /day	grams/metre <sup>2</sup> /day.
g/m <sup>3</sup>	Grams per cubic metre, and equivalent to milligrams per litre (mg/L). In water, this is also equivalent to parts per million (ppm), but the same does not apply to gaseous mixtures.
Incident	An event that is alleged or is found to have occurred that may have actual or potential environmental consequences or may involve non-compliance with a consent or rule in a regional plan. Registration of an incident by the Council does not automatically mean such an outcome had actually occurred.
Intervention	Action/s taken by Council to instruct or direct actions be taken to avoid or reduce the likelihood of an incident occurring.
Investigation	Action taken by Council to establish what were the circumstances/events surrounding an incident including any allegations of an incident.
Incident Register	The Incident Register contains a list of events recorded by the Council on the basis that they may have the potential or actual environmental consequences that may represent a breach of a consent or provision in a Regional Plan.
LEL	Lower Explosive Limit (LEL) gives the percentage of the lower explosive limit, expressed as methane, that is detected in the air sampled.
m <sup>2</sup>	Square Metres:
MCI	Macroinvertebrate community index; a numerical indication of the state of biological life in a stream that takes into account the sensitivity of the taxa present to organic pollution in stony habitats.
MfE	Ministry for the Environment.
Mixing zone	The zone below a discharge point where the discharge is not fully mixed with the receiving environment. For a stream, conventionally taken as a length equivalent to 7 times the width of the stream at the discharge point.
mS/m	Millisiemens per metre.
NES	National Environmental Standard
NOx	Nitrogen oxides
NTU	Nephelometric Turbidity Unit, a measure of the turbidity of water.
O&G	Oil and grease, defined as anything that will dissolve into a particular organic solvent (e.g. hexane). May include both animal material (fats) and mineral matter (hydrocarbons).
pH	A numerical system for measuring acidity in solutions, with 7 as neutral. Numbers lower than 7 are increasingly acidic and higher than 7 are increasingly alkaline. The scale is logarithmic i.e. a change of 1 represents a ten-fold change in strength. For example, a pH of 4 is ten times more acidic than a pH of 5.

Physicochemical	Measurement of both physical properties (e.g. temperature, clarity, density) and chemical determinants (e.g. metals and nutrients) to characterise the state of an environment.
PM <sub>10</sub>	Relatively fine airborne particles (less than 10 micrometre diameter, respectively).
Resource consent	Refer Section 87 of the RMA. Resource consents include land use consents (refer Sections 9 and 13 of the RMA), coastal permits (Sections 12, 14 and 15), water permits (Section 14) and discharge permits (Section 15).
RMA	<i>Resource Management Act 1991</i> and including all subsequent amendments.
SS	Suspended solids.
SQMCI	Semi quantitative macroinvertebrate community index.
Temp	Temperature, measured in °C (degrees Celsius).
Turb	Turbidity, expressed in NTU.
UI	Unauthorised Incident.

For further information on analytical methods, contact a Science Services Manager.

## Bibliography and references

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- Taranaki Regional Council (2010): *Greymouth Petroleum Limited Turangi-A Wellsite Monitoring Programme Annual Report 2009-2010*. Technical Report 2010-47.
- Taranaki Regional Council (2009): *Greymouth Petroleum Limited Turangi-A Wellsite Monitoring Programme Annual Report 2008-2009*. Technical Report 2009-37.
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## Appendix I

### Resource consents held by Greymouth Petroleum Ltd and Petrochem Ltd

(For a copy of the signed resource consent  
please contact the TRC Consents department)

### **Water abstraction permits**

Section 14 of the RMA stipulates that no person may take, use, dam or divert any water, unless the activity is expressly allowed for by a resource consent or a rule in a regional plan, or it falls within some particular categories set out in Section 14. Permits authorising the abstraction of water are issued by the Council under Section 87(d) of the RMA.

### **Water discharge permits**

Section 15(1)(a) of the RMA stipulates that no person may discharge any contaminant into water, unless the activity is expressly allowed for by a resource consent or a rule in a regional plan, or by national regulations. Permits authorising discharges to water are issued by the Council under Section 87(e) of the RMA.

### **Air discharge permits**

Section 15(1)(c) of the RMA stipulates that no person may discharge any contaminant from any industrial or trade premises into air, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations. Permits authorising discharges to air are issued by the Council under Section 87(e) of the RMA.

### **Discharges of wastes to land**

Sections 15(1)(b) and (d) of the RMA stipulate that no person may discharge any contaminant onto land if it may then enter water, or from any industrial or trade premises onto land under any circumstances, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations. Permits authorising the discharge of wastes to land are issued by the Council under Section 87(e) of the RMA.

### **Land use permits**

Section 13(1)(a) of the RMA stipulates that no person may in relation to the bed of any lake or river use, erect, reconstruct, place, alter, extend, remove, or demolish any structure or part of any structure in, on, under, or over the bed, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations. Land use permits are issued by the Council under Section 87(a) of the RMA.

### **Coastal permits**

Section 12(1)(b) of the RMA stipulates that no person may erect, reconstruct, place, alter, extend, remove, or demolish any structure that is fixed in, on, under, or over any foreshore or seabed, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations. Coastal permits are issued by the Council under Section 87(c) of the RMA.

**Discharge Permit**  
**Pursuant to the Resource Management Act 1991**  
**a resource consent is hereby granted by the**  
**Taranaki Regional Council**

Name of  
Consent Holder: Greymouth Petroleum Limited  
P O Box 3394  
NEW PLYMOUTH 4341

Decision Date  
(Change): 10 September 2013

Commencement Date  
(Change): 10 September 2013 (Granted: 7 December 2004)

**Conditions of Consent**

Consent Granted: To discharge emissions to air during flaring from well workovers and in emergency situations and miscellaneous emissions associated with production activities at the Turangi Road wellsite

Expiry Date: 1 June 2021

Review Date(s): June 2015

Site Location: Turangi Production Station, Turangi Road, Motunui  
(Property owner: BA & JM McKenzie)

Legal Description: Sec 21 Blk VI Waitara SD (Discharge source & site)

Grid Reference (NZTM) 1713792E-5681411N (temporary flare pit)  
1713756E-5681440N

*For General, Standard and Special conditions  
pertaining to this consent please see reverse side of this document*

## **General conditions**

- a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.
- c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:
  - i) the administration, monitoring and supervision of this consent; and
  - ii) charges authorised by regulations.

## **Special conditions**

### **Information and notification**

1. Flaring shall only occur over a pit, or similar containment area, lined with impermeable material that prevents any liquid from leaking through its base or sidewalls and discharging to land.
2. Flaring shall only occur within 20 metres of the location defined by NZTM:
  - 1713792E-5681411N (temporary flare pit); and
  - 1713756E-5681440N.
3. The temporary flare pit shall be removed and site reinstated following the completion of the permanent flare pit.
4. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least one month prior to the establishment of production operations at the Turangi Road wellsite.
5. At least 24 hours prior to any flaring, other than in emergencies, the consent holder shall undertake all practicable measures to notify residents within 1000 metres of the site of the commencement of flaring. The consent holder shall include in the notification a 24-hour contact telephone number for a representative of the consent holder, and shall keep and make available to the Chief Executive, Taranaki Regional Council, a record of all queries and/or complaints received.
6. The consent holder shall, whenever practicable, notify the Chief Executive, Taranaki Regional Council, whenever the continuous flaring of hydrocarbons (other than purge gas) is expected to occur for more than five minutes in duration. Notification shall, as far as practicable, be no less than 24 hours prior to such flaring being commenced.

7. No alteration shall be made to plant equipment or processes which may substantially alter the nature or quantity of flare emissions or other site emissions, including but not limited to the recovery of produced gas, other than as notified in this consent application, without prior consultation with the Chief Executive, Taranaki Regional Council, and the consent holder shall obtain any necessary approvals under the Resource Management Act 1991.

#### **Emissions from the site**

8. Other than for the maintenance of a pilot flare flame, the consent holder shall have regard to the prevailing and predicted wind speed and direction at the time of initiation of any episode of flaring or other combustion of hydrocarbons.
9. All gas being flared, at any time must first be treated by effective liquid and solid separation and recovery, as far as is practicable, to ensure that smoke emission during flaring is minimised.
10. If separation cannot be implemented and/or maintained at any time while there is a flow from the well, whether natural or induced, then the consent holder shall notify the Chief Executive, Taranaki Regional Council, and shall in any case re-establish liquid and solid separation and recovery within three hours.
11. Subject to special conditions 9 and 10, no liquid or solid hydrocarbons shall be combusted through the gas flare system other than in an emergency.
12. Only substances originating from the well stream and treated as outlined by conditions 9, 10, 11 & 13 are to be combusted within the flare pit.
13. The consent holder shall adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or potential effect on the environment arising from any emission to air from the flare or any other emissions to air from the Turangi Road wellsite. Any adoption of the best practicable option as outlined in this special condition shall be to the satisfaction of the Chief Executive, Taranaki Regional Council.
14. The consent holder shall not discharge any contaminant to air authorised by this consent at a rate or a quantity such that the contaminant, whether alone or in combination with other contaminants, is or is liable to be hazardous or toxic or noxious at or beyond the boundary of the wellsite, or beyond 100 metres of the flare, whichever distance is greater.
15. There shall not be any offensive odour or smoke, as determined by an enforcement officer of the Taranaki Regional Council, beyond the boundary of the wellsite or beyond 100 metres of the flare, whichever distance is greater, arising from the exercise of this consent.
16. All hydrocarbon storage vessels shall be fitted with vapour recovery systems.
17. The opacity of any smoke emissions shall not exceed a level of 1 as measured on the Ringelmann Scale for more than four minutes cumulative duration in any 60-minute period.
18. The consent holder shall control all emissions of carbon monoxide to the atmosphere from the flare, whether alone or in conjunction with any other emissions from the

wellsite, in order that the maximum ground level concentration of carbon monoxide arising from the exercise of this consent measured under ambient conditions does not exceed 10 mg/m<sup>3</sup> (eight-hour average exposure), or 30 mg/m<sup>3</sup> one-hour average exposure) at or beyond the boundary of the wellsite or beyond 100 metres from the flare, whichever distance is greater.

19. The consent holder shall control all emissions of nitrogen oxides to the atmosphere from the flare, whether alone or in conjunction with any other emissions from the wellsite, in order that the maximum ground level concentration of nitrogen dioxide arising from the exercise of this consent measured under ambient conditions does not exceed 100 micrograms per cubic metre (24-hour average exposure), or 200 micrograms per cubic metre (1-hour average exposure) at or beyond the boundary of the wellsite, or beyond 100 metres from the flare, whichever distance is greater.
20. The consent holder shall control emissions to the atmosphere from the wellsite and flare of contaminants other than carbon dioxide, carbon monoxide, and nitrogen oxides, whether alone or in conjunction with any emissions from the flare, in order that the maximum ground level concentration for any particular contaminant arising from the exercise of this consent measured at or beyond the boundary of the wellsite or beyond 100 metres from the flare, whichever distance is greater, is not increased above background levels:
  - a) by more than 1/30<sup>th</sup> of the relevant Occupational Threshold Value-Time Weighted Average, or by more than the Short Term Exposure Limit at any time (all terms as defined in Workplace Exposure Standards, 2002, Department of Labour); or
  - b) if no Short Term Exposure Limit is set, by more than three times the Time Weighted Average at any time (all terms as defined in Workplace Exposure Standards, 2002, Department of Labour).

### **Recording and reporting information**

21. The consent holder shall keep and make available to the Chief Executive, Taranaki Regional Council, upon request, a record of all smoke-emitting incidents noting time, duration and cause.
22. The consent holder shall keep and maintain a log of all continuous flaring incidents longer than five minutes, and any intermittent flaring lasting for an aggregate of ten minutes or longer in any 120-minute period. Such a log shall contain the date, the start and finish times, the quantity and type of material flared, and the reason for flaring. This log shall be made available to the Chief Executive, Taranaki Regional Council, upon request, and summarised annually in the report required under condition 20.
23. The consent holder shall supply to the Taranaki Regional Council each month a copy of flaring information comprising: the type and amount of material flared (including any gas used to maintain a pilot flame), the date this was flared, the reason why flaring was undertaken, and an indication of whether smoke was produced from such flaring events.
24. The consent holder shall provide to the Taranaki Regional Council during May of each year, for the duration of this consent, a report:
  - i) detailing any energy efficiency measures implemented on the site;

- ii) detailing smoke emissions as required under condition 21;
  - iii) detailing any measures to reduce smoke emissions;
  - iv) detailing any measures to reduce flaring;
  - v) addressing any other issue relevant to the minimisation or mitigation of emissions from the flare;
  - vi) detailing any complaints received and any measures undertaken to address complaints; and
  - vii) reviewing all options and technological advances relevant to the reduction or mitigation of any discharge to air from the site, how these might be applicable and/or implemented at the site, and the benefits and costs of these advances.
25. The consent holder shall make available to the Chief Executive, Taranaki Regional Council, upon request, an analysis of a typical gas and crude oil stream from the field, covering sulphur compound content and the content of carbon compounds of structure C<sub>6</sub> or higher number of compounds.
- Lapse and Review**
26. This consent shall lapse on the expiry of 16 years after the date of first issue of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.
27. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2009 and/or June 2015, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 10 September 2013

For and on behalf of  
Taranaki Regional Council

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**Director-Resource Management**



**Discharge Permit**  
**Pursuant to the Resource Management Act 1991**  
**a resource consent is hereby granted by the**  
**Taranaki Regional Council**

Name of  
Consent Holder: Petrochem Limited  
P O Box 1394  
Shortland Street  
AUCKLAND

Consent Granted  
Date: 1 November 2005

**Conditions of Consent**

Consent Granted: To discharge emissions to air during flaring from well workovers and in emergency situations and miscellaneous emissions associated with production activities at the Kowhai-A wellsite at or about (NZTM)  
1710907E-5676255N

Expiry Date: 1 June 2021

Review Date(s): June 2009, June 2021

Site Location: Kowhai-A wellsite, Ngatimaru Road, Tikorangi, Waitara  
[Property owner: BJ & RN Jupp]

Legal Description: Pt Sec 44 Tikorangi Dist Blks IX & X Waitara SD

*For General, Standard and Special conditions  
pertaining to this consent please see reverse side of this document*

## **General conditions**

- a) On receipt of a requirement from the Chief Executive, Taranaki Regional Council the consent holder shall, within the time specified in the requirement, supply the information required relating to the exercise of this consent.
- b) Unless it is otherwise specified in the conditions of this consent, compliance with any monitoring requirement imposed by this consent must be at the consent holder's own expense.
- c) The consent holder shall pay to the Council all required administrative charges fixed by the Council pursuant to section 36 in relation to:
  - i) the administration, monitoring and supervision of this consent; and
  - ii) charges authorised by regulations.

## **Special conditions**

### **Information and notification**

1. The consent holder shall notify the Chief Executive, Taranaki Regional Council, in writing at least one month prior to the establishment of production operations at the Kowhai-A wellsite.
2. At least 24 hours prior to any flaring, other than in emergencies, the consent holder shall undertake all practicable measures to notify residents within 1000 metres of the site of the commencement of flaring. The consent holder shall include in the notification a 24-hour contact telephone number for a representative of the consent holder, and shall keep and make available to the Chief Executive, Taranaki Regional Council, a record of all queries and/or complaints received.
3. The consent holder shall, whenever practicable, notify the Chief Executive, Taranaki Regional Council, whenever the continuous flaring of hydrocarbons [other than purge gas] is expected to occur for more than five minutes in duration. Notification shall, as far as practicable, be no less than 24 hours prior to such flaring being commenced.
4. No alteration shall be made to plant equipment or processes which may substantially alter the nature or quantity of flare emissions or other site emissions, including but not limited to the recovery of produced gas, other than as notified in this consent application, without prior consultation with the Chief Executive, Taranaki Regional Council, and the consent holder shall obtain any necessary approvals under the Resource Management Act 1991.

**Emissions from the site**

5. Other than for the maintenance of a pilot flare flame, the consent holder shall have regard to the prevailing and predicted wind speed and direction at the time of initiation of any episode of flaring or other combustion of hydrocarbons.
6. All gas being flared, at any time must first be treated by effective liquid and solid separation and recovery, as far as is practicable, to ensure that smoke emission during flaring is minimised.
7. If separation cannot be implemented and/or maintained at any time while there is a flow from the well, whether natural or induced, then the consent holder shall notify the Chief Executive, Taranaki Regional Council, and shall in any case re-establish liquid and solid separation and recovery within three hours.
8. Subject to special conditions 6 and 7, no liquid or solid hydrocarbons shall be combusted through the gas flare system other than in an emergency.
9. Only substances originating from the well stream and treated as outlined by conditions 6, 7, 8, and 10 shall be combusted within the flare pit.
10. The consent holder shall adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or potential effect on the environment arising from any emission to air from the flare or any other emissions to air from the Kowhai-A wellsite. Any adoption of the best practicable option as outlined in this special condition shall be to the satisfaction of the Chief Executive, Taranaki Regional Council.
11. The consent holder shall not discharge any contaminant to air authorised by this consent at a rate or a quantity such that the contaminant, whether alone or in combination with other contaminants, is or is liable to be hazardous or toxic or noxious at or beyond the boundary of the wellsite, or beyond 100 metres of the flare, whichever distance is greater.
12. There shall not be any offensive odour or smoke, as determined by an enforcement officer of the Taranaki Regional Council, beyond the boundary of the wellsite or beyond 100 metres of the flare, whichever distance is greater, arising from the exercise of this consent.
13. All hydrocarbon storage vessels shall be fitted with vapour recovery systems.
14. The opacity of any smoke emissions shall not exceed a level of 1 as measured on the Ringelmann Scale for more than four minutes cumulative duration in any 60-minute period.
15. The consent holder shall control all emissions of carbon monoxide to the atmosphere from the flare, whether alone or in conjunction with any other emissions from the wellsite, in order that the maximum ground level concentration of carbon monoxide arising from the exercise of this consent measured under ambient conditions does not exceed 10 mg/m<sup>3</sup> [eight-hour average exposure], or 30 mg/m<sup>3</sup> one-hour average exposure] at or beyond the boundary of the wellsite or beyond 100 metres from the flare, whichever distance is greater.

## Consent 6719-1

16. The consent holder shall control all emissions of nitrogen oxides to the atmosphere from the flare, whether alone or in conjunction with any other emissions from the wellsite, in order that the maximum ground level concentration of nitrogen dioxide arising from the exercise of this consent measured under ambient conditions does not exceed 100 mg/m<sup>3</sup> [24-hour average exposure], or 200 mg/m<sup>3</sup> [1-hour average exposure] at or beyond the boundary of the wellsite, or beyond 100 metres from the flare, whichever distance is greater.
17. The consent holder shall control emissions to the atmosphere from the wellsite and flare of contaminants other than carbon dioxide, carbon monoxide, and nitrogen oxides, whether alone or in conjunction with any emissions from the flare, in order that the maximum ground level concentration for any particular contaminant arising from the exercise of this consent measured at or beyond the boundary of the wellsite or beyond 100 metres from the flare, whichever distance is greater, is not increased above background levels:
  - a) by more than 1/30<sup>th</sup> of the relevant Occupational Threshold Value-Time Weighted Average, or by more than the Short Term Exposure Limit at any time [all terms as defined in Workplace Exposure Standards, 2002, Department of Labour]; or
  - b) if no Short Term Exposure Limit is set, by more than three times the Time Weighted Average at any time [all terms as defined in Workplace Exposure Standards, 2002, Department of Labour].

### Recording and reporting information

18. The consent holder shall keep and make available to the Chief Executive, Taranaki Regional Council, upon request, a record of all smoke-emitting incidents noting time, duration and cause.
19. The consent holder shall keep and maintain a log of all continuous flaring incidents longer than five minutes, and any intermittent flaring lasting for an aggregate of ten minutes or longer in any 120-minute period. Such a log shall contain the date, the start and finish times, the quantity and type of material flared, and the reason for flaring. This log shall be made available to the Chief Executive, Taranaki Regional Council, upon request, and summarised annually in the report required under condition 20.
20. The consent holder shall provide to the Taranaki Regional Council during May of each year, for the duration of this consent, a report:
  - i. detailing any energy efficiency measures implemented on the site;
  - ii. detailing smoke emissions as required under condition 18;
  - iii. detailing any measures to reduce smoke emissions;
  - iv. detailing any measures to reduce flaring;
  - v. addressing any other issue relevant to the minimisation or mitigation of emissions from the flare;
  - vi. detailing any complaints received and any measures undertaken to address complaints; and

- vii. reviewing all options and technological advances relevant to the reduction or mitigation of any discharge to air from the site, how these might be applicable and/or implemented at the site, and the benefits and costs of these advances.
21. The consent holder shall make available to the Chief Executive, Taranaki Regional Council, upon request, an analysis of a typical gas and crude oil stream from the field, covering sulphur compound content and the content of carbon compounds of structure C<sub>6</sub> or higher number of compounds.

**Lapse and Review**

22. This consent shall lapse on the expiry of 16 years after the date of issue of this consent, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.
23. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2009 and/or June 2015, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Transferred at Stratford on 22 July 2008

For and on behalf of  
Taranaki Regional Council

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**Director-Resource Management**



**Discharge Permit**  
**Pursuant to the Resource Management Act 1991**  
**a resource consent is hereby granted by the**  
**Taranaki Regional Council**

Name of  
Consent Holder: Petrochem Limited  
PO Box 3394  
New Plymouth 4341

Decision Date: 15 January 2016

Commencement Date: 15 January 2016

**Conditions of Consent**

Consent Granted: To discharge treated stormwater from hydrocarbon exploration and production operations at the Kowhai-A wellsite onto land and into an unnamed tributary of the Waiau Stream

Expiry Date: 1 June 2033

Review Date(s): June 2021, June 2027

Site Location: Kowhai-A wellsite, Ngatimaru Road, Tikorangi  
(Property owner: RN & BJ Jupp)

Legal Description: Pt Sec 44 Tikorangi Dist Blks IX & X Waitara SD  
(Dsicharge source & site)

Grid Reference (NZTM) 1710907E-5676255N

Catchment: Waiau

*For General, Standard and Special conditions  
pertaining to this consent please see reverse side of this document*

## **General condition**

- a. The consent holder shall pay to the Taranaki Regional Council all the administration, monitoring and supervision costs of this consent, fixed in accordance with section 36 of the Resource Management Act 1991.

## **Special conditions**

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or likely adverse effect on the environment associated with the discharge of contaminants from the site.
2. Stormwater discharged shall be collected from a catchment area of no more than 1.2 Ha.
3. At least 5 working days prior, the consent holder shall advise the Chief Executive, Taranaki Regional Council of the date of each of the following events:
  - a) commencement of any site works (site works includes the introduction of a drilling rig, drilling equipment or any other associated equipment for the purpose of drilling, testing, well stimulation or well workover that may introduce contaminants to the site);
  - b) commencement of any well drilling operation; and
  - c) recommencement of any site works or drilling operations following a period of inactivity exceeding 30 days.

If any of these events is rescheduled or delayed, the consent holder shall immediately provide further notice advising of the new date.

Any advice given in accordance with this condition shall include the consent number and the wellsite name and be emailed to [worknotification@trc.govt.nz](mailto:worknotification@trc.govt.nz).

4. The consent holder shall maintain and regularly update a contingency plan that details measures and procedures to be undertaken to prevent spillage or accidental discharge of contaminants not authorised by this consent and measures to avoid, remedy or mitigate the environmental effects of such a spillage or discharge. The plan shall be approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity prior to any discharge from the site.
5. Subject to the other conditions of this consent the design, management and maintenance of the stormwater system shall be undertaken in accordance with the information submitted in support of the application for this consent, in particular the Stormwater Management Plan.
6. All discharges from the site, including from any containment pit or hydrocarbon combustion facility (e.g. flare pit, thermal oxidiser), shall flow to a perimeter drain and skimmer pit. Perimeter drains shall be designed, including by having a positive grade and low permeability, to ensure that runoff flows directly to a skimmer pit without ponding.

7. The skimmer pit system shall have a combined capacity of no less than 280 m<sup>3</sup> including a 'freeboard' of no less than 147 m<sup>3</sup>, and be designed to retain any hydrocarbons that enter it.
8. All skimmer pits and any other stormwater retention areas shall be lined with an impervious material to prevent seepage through the bed and sidewalls, and all skimmer pits shall have a valve that can be shut off to prevent any discharge from the site.
9. Perimeter drains and skimmer pits necessary to comply with the conditions of this consent shall be installed before any site works commences. Site works includes the introduction of a drilling rig, drilling equipment or any other associated equipment or facilities to the site for any purpose other than for the construction of the site.
10. Subject to condition 11 the constituents in the discharge shall meet the standards shown in the following table before discharging to land.

<b>Constituent</b>	<b>Standard</b>
pH	Within the range 6.0 to 9.0
suspended solids	Concentration not greater than 100 gm <sup>-3</sup>
total recoverable hydrocarbons	Concentration not greater than 15 gm <sup>-3</sup> (as determined by infrared spectroscopic technique)
chloride	Concentration not greater than 230 gm <sup>-3</sup>

11. The pH may exceed 9.0 if the exceedance is a result photosynthetic activity within the skimmer pits, but in any case the discharge shall not result in the pH of the receiving water increasing by more than 0.5 pH units after allowing for a mixing zone of 20 metres from the confluence of the receiving water with the tributary of the Waiau Stream.
12. After allowing for a mixing zone of 20 metres from the confluence of the receiving water with the tributary of the Waiau Stream, the discharge shall not cause any of the following effects in the receiving water:
  - a) an increase in the temperature of more than 2 degrees Celsius;
  - b) the filtered carbonaceous biochemical oxygen demand to exceed 2 gm<sup>-3</sup>; or
  - c) the chloride concentration to exceed 50 gm<sup>-3</sup>.
13. After allowing for a mixing zone of 20 metres from the confluence of the receiving water with the tributary of the Waiau Stream, the discharge shall not give rise to any of the following effects in the receiving water:
  - a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
  - b) any conspicuous change in the colour or visual clarity;
  - c) any emission of objectionable odour;
  - d) the rendering of fresh water unsuitable for consumption by farm animals;
  - e) any significant adverse effects on aquatic life.

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14. The consent holder shall advise the Chief Executive, Taranaki Regional Council, in writing at least 48 hours prior to the reinstatement of the site and the reinstatement shall be carried out so as to minimise adverse effects on stormwater quality. Notification shall include the consent number and a brief description of the activity consented and be emailed to [worknotification@trc.govt.nz](mailto:worknotification@trc.govt.nz).
15. This consent shall lapse on 31 March 2021, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.
16. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2021 and/or June 2027, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 15 January 2016

For and on behalf of  
Taranaki Regional Council

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A D McLay  
**Director - Resource Management**

**Discharge Permit**  
**Pursuant to the Resource Management Act 1991**  
**a resource consent is hereby granted by the**  
**Taranaki Regional Council**

Name of Consent Holder: Greymouth Petroleum Turangi Limited  
PO Box 3394  
Fitzroy  
New Plymouth 4341

Decision Date 9 January 2019

Commencement Date 9 January 2019

**Conditions of Consent**

Consent Granted: To discharge treated stormwater from hydrocarbon exploration and production operations at the Turangi-A Production Station, onto land and into an unnamed tributary of the Parahaki Stream and into the Parahaki Stream

Expiry Date: 1 June 2033

Review Date(s): June 2021, June 2027

Site Location: Turangi-A Production Station, 126 Turangi Road, Motunui (Property owner: BA & JM McKenzie & Ducal Products Limited)

Grid Reference (NZTM) 1713970E-5681327N  
1713982E-5681378N  
1713728E-5681343N

Catchment: Parahaki

*For General, Standard and Special conditions  
pertaining to this consent please see reverse side of this document*

## General condition

- a. The consent holder shall pay to the Taranaki Regional Council all the administration, monitoring and supervision costs of this consent, fixed in accordance with section 36 of the Resource Management Act 1991.

## Special conditions

1. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or likely adverse effect on the environment associated with the discharge of contaminants from the site.
2. Stormwater discharged shall be collected and discharged through skimmer pits as detailed below:

Skimmer pit location co-ordinates	Skimmer pit reference	Catchment area	Approximate total volume	Discharge co-ordinates	Stream discharging into
1713945E-5681379N	Original dual skimmer pits installed in 2004	9665 m <sup>2</sup>	370 m <sup>3</sup>	1713970E-5681327N	Unnamed tributary of the Parahaki Stream
1713907E-5681337N	Skimmer Pits installed in 2014 as part of the site expansion	10970 m <sup>2</sup>	170 m <sup>3</sup>	1713982E-5681378N	Unnamed tributary of the Parahaki Stream
1713779E-5681357N	Proposed new skimmer pits	8745 m <sup>2</sup>	96 m <sup>3</sup>	1713728E-5681343N	Parahaki Stream

3. At least 5 working days prior, the consent holder shall advise the Chief Executive, Taranaki Regional Council of the date of each of the following events:
  - a) commencement of any site works (site works includes the introduction of a drilling rig, drilling equipment or any other associated equipment or facilities to the site for any purpose other than for the construction of the site);
  - b) commencement of any well drilling operation; and
  - c) recommencement of any site works or drilling operations following a period of inactivity exceeding 30 days.

If any of these events is rescheduled or delayed, the consent holder shall immediately provide further notice advising of the new date.

Any advice given in accordance with this condition shall include the consent number and the wellsite name and be emailed to [worknotification@trc.govt.nz](mailto:worknotification@trc.govt.nz).

4. The consent holder shall maintain and regularly update a 'Contingency Plan' that details measures and procedures that will be undertaken to prevent, and to avoid environmental effects from, a spillage or any discharge of contaminants not authorised by this consent. The plan and any amended versions shall be provided to the Chief Executive of the Taranaki Regional Council.

## Consent 10703-1.0

5. Subject to the other conditions of this consent the design, management and maintenance of the stormwater system shall be undertaken in accordance with the information submitted in support of the application for this consent, in particular the:
  - a) Stormwater Design Report, Revision 2 and dated December 2013;
  - b) Drawing 12364-02, Sheet 1, Revision 2 and dated December 2013;
  - c) Drawing 12364-02, Sheet 2, Revision 3 and dated December 2013;
  - d) Drawing 12364-02, Sheet 3, Revision 2 and dated December 2013;
  - e) Drawing 12364-02, Sheet 4, Revision 3 and dated December 2013;
  - f) Drawing 12364-02, Sheet 5, Revision 3 and dated December 2013;
  - g) Drawing 12364-02, Sheet 6, Revision 3 and dated December 2013;
  - h) Stormwater Design Report, Revision B and dated May 2018;
  - i) Drawing 180768, Sheet 1, Revision A and dated September 2018 ;
  - j) Drawing 180768, Sheet 2, Revision A and dated September 2018; and
  - k) Drawing 180768, Sheet 3, Revision A and dated September 2018.
6. All discharges from the site, including from any containment pit or hydrocarbon combustion facility (e.g. flare pit, thermal oxidiser), shall flow to a perimeter drain and skimmer pit. Perimeter drains shall be designed, including by having a positive grade and low permeability, to ensure that runoff flows directly to a skimmer pit without ponding.
7. All skimmer pits and any other stormwater retention areas shall be lined with an impervious material to prevent seepage through the bed and sidewalls, and all skimmer pits shall have a valve that can be shut off to prevent any discharge from the site.
8. Constituents in the discharge shall meet the standards shown in the following table.

Constituent	Standard
pH	Within the range 6.0 to 9.0
suspended solids	Concentration not greater than 100 gm <sup>-3</sup>
total recoverable hydrocarbons	Concentration not greater than 15 gm <sup>-3</sup> [as determined by infrared spectroscopic technique]
chloride	Concentration not greater than 230 gm <sup>-3</sup>

9. The pH may exceed 9.0 if the exceedance is a result of photosynthetic activity within the skimmer pits, but in any case, the discharge shall not result in the pH of the receiving water increasing by more than 0.5 pH units after allowing for a mixing zone of 20 metres from the confluence of the receiving waters with the unnamed tributary and Parahaki Stream.
10. After allowing for a mixing zone of 20 metres from the confluence of the receiving water with the unnamed tributary and the Parahaki Stream, the discharge shall not cause any of the following effects in the receiving water:
  - a) an increase in the temperature of more than 2 degrees Celsius;
  - b) the filtered carbonaceous biochemical oxygen demand to exceed 2 gm<sup>-3</sup>; or
  - c) the chloride concentration to exceed 50 gm<sup>-3</sup>.

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11. After allowing for a mixing zone of 20 metres, the discharge shall not give rise to any of the following effects in the receiving water:
  - a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;
  - b) any conspicuous change in the colour or visual clarity;
  - c) any emission of objectionable odour;
  - d) the rendering of fresh water unsuitable for consumption by farm animals;
  - e) any significant adverse effects on aquatic life.
12. The consent holder shall advise the Chief Executive, Taranaki Regional Council, in writing at least 48 hours prior to the reinstatement of the site and the reinstatement shall be carried out so as to minimise adverse effects on stormwater quality. Notification shall include the consent number and a brief description of the activity consented and be emailed to [worknotification@trc.govt.nz](mailto:worknotification@trc.govt.nz).
13. This consent shall lapse on 31 March 2024, unless the consent is given effect to before the end of that period or the Taranaki Regional Council fixes a longer period pursuant to section 125(1)(b) of the Resource Management Act 1991.
14. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June 2021 and/or June 2027, for the purpose of ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time.

Signed at Stratford on 9 January 2019

For and on behalf of  
Taranaki Regional Council

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A D McLay  
Director - Resource Management