Greymouth Petroleum Ltd
Southern Sites

Monitoring Programme

Annual Report

2020-2021

Technical Report 2021-38

Working with people | caring for Taranaki

Taranaki Regional Council

Taranaki Regional Council
Private Bag 713
Stratford

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Executive summary

Greymouth Petroleum Ltd (GPL) operates the Kaimiro Production Station located at Inglewood, in the Waiongana catchment, and the associated Ngatoro-A satellite wellsite also located at Inglewood, in the Waitara catchment. Radnor Production Station is also operated by GPL and this is located at Midhirst in the Patea catchment. This report for the period July 2020 to June 2021 describes the monitoring programme implemented by the Taranaki Regional Council (the Council) to assess the Company'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 the Company's activities.

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

GPL hold eight resource consents relating to production activities at the southern sites during the monitoring period, which included a total of 132 conditions setting out the requirements that GPL must satisfy. GPL held two consents to allow it to take and use water, three consents to discharge treated stormwater and wastewater into the Mangaoraka and Ngatoro Streams, and three consents to discharge emissions into the air.

The Council's monitoring programme for the year under review included three inspections each of the Kaimiro and Radnor production stations and the Ngatoro-A satellite site; and an annual inspection of associated wellsites. Six water samples each were collected from the Kaimiro Production Station and the Ngatoro-A site for physicochemical analysis, while two biomonitoring surveys of receiving waters and two ambient air quality surveys were carried out in relation to the Kaimiro Production Station.

The results of biomonitoring carried out in the Mangaoraka Stream, indicated that the discharges were not having a significant adverse effect on the water quality downstream of the Kaimiro Production Station.

There were no adverse effects on the environment resulting from the exercise of the air discharge consents. Ambient air quality monitoring at the Kaimiro Production Station showed that levels of carbon monoxide, combustible gases, PM_{10} 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 period under review, GPL demonstrated a high level of both environmental performance and administrative compliance with the resource consents.

For reference, in the 2020-2021 year, consent holders were found to achieve a high level of environmental performance and compliance for 86% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 11% 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 2021-2022 year.

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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 2020 to June 2021 by the Taranaki Regional Council (the Council) on the monitoring programme associated with resource consents held by Greymouth Petroleum Ltd (GPL). GPL operates the Kaimiro Production Station situated on Upland Road at Inglewood, in the Waiongana catchment. The associated Ngatoro-A satellite site is located on Upper Dudley Road at Inglewood, in the Waitara catchment. A further 20 wellsites are monitored annually in conjunction with the Kaimiro Production Station. Radnor Production Station is also operated by GPL and is located on Radnor Road in Midhirst in the Patea 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 abstractions and discharges of water within the Waiongana, Waitara and Patea catchments, and the air discharge permits held 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 GPL's use of water, land and air, and is the 16th combined annual report by the Council for the Kaimiro 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 though annual programmes;
- the resource consents held by GPL in the Waiongana, Waitara and Patea 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 Kaimiro and Radnor production stations, and the Ngatoro-A satellite site.

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 2021-2022 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' in as much 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 2020-2021 year, consent holders were found to achieve a high level of environmental performance and compliance for 86% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 11% of the consents, a good level of environmental performance and compliance was achieved. [1]

1.2 Process description

1.2.1 Kaimiro Production Station

The Kaimiro Production Station (Photo 1) was commissioned in 1985. The production station separates and treats oil and gas from wells in the Kaimiro and Ngatoro fields. Oil is piped to the Omata tank farm and gas is piped into the national grid. Wellsites associated with the Kaimiro Production Station are as follows: Kaimiro: B, C, D, F, G, H, J, K, O; Ngatoro: A, B, C, D, E, F. G; Salisbury; Goldie; Windsor.

The production station's BTEX vapour incinerator was replaced in October 2007 with a more efficient unit. A new gas compressor was commissioned in June 2008 and upgrades made to all existing compressor PLC

[1] The Council has used these compliance grading criteria for more than 17 years. They align closely with the 4 compliance grades in the MfE Best Practice Guidelines for Compliance, Monitoring and Enforcement, 2018

control systems. These measures have resulted in a significant sustained improvement in plant energy efficiency at the Kaimiro site.

Photo 1 Kaimiro Production Station

Stormwater from the Kaimiro Production Station passes through a separator system, skimmer pit and sediment settling pond before discharging to an unnamed tributary of the Mangaoraka Stream. All chemical storage is contained within bunds and isolated from the stormwater system.

1.2.2 Radnor Production Station

Photo 2 Radnor Production Station

The Radnor wellsite (Photo 2) was constructed in 2003 with the first well drilled in 2004. A production station to handle oil and gas from the Radnor-B wellsite was constructed in late 2004, with commissioning

of the plant in March 2005. A number of drilling campaigns were conducted, but the wells were eventually shut-in or abandoned and production ceased in 2010. Production resumed in late 2014 with the Radnor Production Station processing oil and gas from the Radnor-1B well. The Radnor-2 well was drilled during the monitoring period under review. The site is currently a remote, unmanned facility. Gas is exported to Methanex via a pipeline and oil is loaded out by tanker twice per week and transported to Kaimiro Production Station.

1.2.3 Ngatoro-A satellite site

Photo 3 Ngatoro-A wellsite

Ngatoro-A (Photo 3) was established in July 1992. The site consists of four wells (Ngatoro-1, 6, 7 and 8), storage facilities for recovered oil, and a bunded earth flare pit. In July 1999 the north-east skimmer pit at the site was decommissioned. The south-west skimmer pit now receives all stormwater from the site for treatment prior to discharge to an unnamed tributary of the Ngatoro Stream. Recovered oil and gas is piped off site to the Kaimiro Production Station, and consequently flaring has been reduced.

1.3 Resource consents

GPL hold eight resource consents, the details of which are summarised in the table below. 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 the Company during the period under review.

Table 1 Resource consents held by GPL

Site	Consent number	Purpose	Granted	Review	Expires
Kaimiro Production Station	4048-3	To discharge emissions into the air from the flaring of hydrocarbons arising from hydrocarbon production and hydrocarbon processing operations together with miscellaneous emissions at the Kaimiro Production Station	Jan 2008	-	June 2026

Site	Consent number	Purpose	Granted	Review	Expires
	10772-1	To discharge treated stormwater from the Kaimiro Production Station site into an unnamed tributary of the Mangaoraka Stream	Nov 2019	June 2026	June 2038
Kaimiro-O	5384-2	To take groundwater from the Matemateaonga Formation for use in enhanced hydrocarbon recovery activities at the Kaimiro-O wellsite.	Sept 1988	June 2026	June 2032
Radnor Production Station	6394-1	To discharge emissions to air during flaring from well workovers, in emergency situations, from a permanent pilot flame and other miscellaneous emissions associated with production activities at the Radnor-B wellsite	June 2004	-	June 2022
	6399-1	To take water from the Piakau Stream for hydrocarbon exploration purposes associated with the Radnor-B wellsite	June 2004	-	June 2022
	9966-1	To discharge treated stormwater from hydrocarbon exploration and production operations at the Radnor-B wellsite through a roadside drain into an unnamed tributary of the Piakau Stream	Sep 2014	Nov 2022	June 2028
Ngatoro-A	4073-3	To discharge treated stormwater from hydrocarbon exploration and production operations at the Ngatoro-A wellsite, onto land and into an unnamed tributary of the Ngatoro Stream	June 2016	-	June 2021
	7295-1	To cover discharge of emissions to air during flaring from well workovers and in emergency situations and miscellaneous emissions associated with production activities at the Ngatoro-A site	May 2008	-	June 2027

1.3.1 Related consents

GPL also holds a number of consents relating to the sites which did not require active (sampling based) monitoring during the period under review. A summary of these consents is provided in Table 2.

Table 2 Consents related to Kaimiro Production Station, Radnor Production Station and Ngatoro-A

Wellsite	Consent number	Purpose	Issue date	Expiry
Kaimiro-B	3678-2	To discharge treated stormwater from hydrocarbon exploration operations at the Kaimiro-B wellsite into an unnamed tributary of the Mangaoraka Stream in the Waiongana catchment	Feb 2002	June 2020*
	5481-2	To discharge emissions to air associated with hydrocarbon producing wells at the Kaimiro-B wellsite	June 2014	June 2032
Kaimiro-C	4153-2	To discharge treated stormwater, treated produced water, and treated drilling wastewater from hydrocarbon exploration and production activities at the Kaimiro-C wellsite onto land and into an unnamed tributary of the Mangaoraka Stream	Dec 2013	June 2026
	9750-1	To discharge emissions to air associated with hydrocarbon producing wells at the Kaimiro-C wellsite	Dec 2013	June 2032

Wellsite	Consent number	Purpose	Issue date	Expiry
Kaimiro-D	4165-2	To discharge treated stormwater, treated produced water, and treated drilling wastewater from hydrocarbon exploration and production operations at the Kaimiro-D wellsite into an unnamed tributary of the Mangaoraka Stream in the Waiongana catchment	Dec 2007	June 2026
	7300-1	To discharge emissions to air during flaring from well workovers and in emergency situations and miscellaneous emissions associated with production activities at the Kaimiro-D wellsite	May 2008	June 2026
Kaimiro-F	4553-2	To discharge treated stormwater, treated produced water, and treated drilling wastewater from hydrocarbon exploration and production operations at the Kaimiro-F wellsite into an unnamed tributary of the Manganaeia Stream in the Waiongana catchment	Jan 2008	June 2026
Kaimiro-F	7299-1	To discharge emissions to air during flaring from well workovers and in emergency situations and miscellaneous emissions associated with production activities at the Kaimiro-F wellsite	May 2008	June 2026
Kaimiro-G	4610-2	To discharge treated stormwater, treated surplus drilling water, and treated produced water from hydrocarbon exploration and production operations at the Kaimiro-G wellsite, onto land and into an unnamed tributary of the Mangaoraka Stream	May 2014	June 2026
	7296-1	To discharge emissions to air during flaring from well workovers and in emergency situations and miscellaneous emissions associated with production activities at the Kaimiro-G wellsite	May 2008	June 2026
Kaimiro-H	4555-2	To discharge treated stormwater, treated produced water, and treated drilling wastewater from hydrocarbon exploration and production operations at the Kaimiro-H wellsite into the Manganaeia Stream in the Waiongana catchment	Jan 2008	June 2026
	7298-1	To discharge emissions to air during flaring from well workovers and in emergency situations and miscellaneous emissions associated with production activities at the Kaimiro-H wellsite	May 2008	June 2026
Kaimiro-J	4612-2	To discharge treated stormwater, treated produced water and treated drilling wastewater from hydrocarbon production and exploration at the Kaimiro-J wellsite onto land and into an unnamed tributary of the Mangaoraka Stream	Dec 2013	June 2026
	7297-1	To discharge emissions to air during flaring from well workovers and in emergency situations and miscellaneous emissions associated with production activities at the Kaimiro-J wellsite	Dec 2013	June 2026
Kaimiro-K	4820-2	To discharge treated stormwater and treated produced water from hydrocarbon exploration and production operations at the Kaimiro-K wellsite, into an unnamed tributary of the Manganaeia Stream	Jun 2014	June 2032
Kaimiro-O	5192-2	To discharge uncontaminated and treated stormwater [excluding produced water and drilling fluids] from hydrocarbon exploration and production operations at the Kaimiro-O wellsite into the Waiwhakaiho River	Jan 2008	June 2026
Ngatoro-B	3951-3	To discharge treated wastewater and treated stormwater from hydrocarbon exploration and production operations at the Ngatoro-B wellsite into an unnamed tributary of the Ngatoro Stream in the Waitara catchment	April 2009	June 2027

Wellsite	Consent number	Purpose	Issue date	Expiry
	7220-1	To cover discharge of emissions to air during flaring from well workovers and in emergency situations and miscellaneous emissions associated with production activities at the Ngatoro-B site	May 2008	June 2027
Ngatoro-C	4015-3	To discharge treated stormwater from hydrocarbon exploration and production operations at the Ngatoro-C wellsite, into an unnamed tributary of the Kurapete Stream	Jul 2015	June 2033
	7294-2	To discharge emissions to air associated with hydrocarbon producing wells at the Ngatoro-C wellsite	Mar 2014	June 2033
Ngatoro-D	4070-3	To discharge treated stormwater from hydrocarbon exploration and production operations at the Ngatoro-D wellsite, onto land where it may enter an unnamed tributary of the Waionganaiti Stream	Mar 2015	June 2032
	7219-2	To discharge emissions to air associated with hydrocarbon producing wells at the Ngatoro-D wellsite	Apr 2014	June 2026
Ngatoro-E	4067-3	To discharge treated stormwater from hydrocarbon exploration and production operations at the Ngatoro-E wellsite, onto land and into the Ngatoroiti Stream	Jun 2016	June 2033
	4069-4	To discharge emissions to air from flaring during hydrocarbon exploration and production testing associated with up to 4 new wells, flaring from well workover activities and in emergency situations associated with production activities, and miscellaneous emissions at the Ngatoro-E wellsite.	Dec 2013	June 2021
Ngatoro-F	5974-1	To discharge stormwater, uncontaminated treated site water, and uncontaminated treated produced water from hydrocarbon exploration and production operations at the Tabla-1 wellsite onto and into land and into an unnamed tributary of the Ngatoroiti Stream a tributary of the Ngatoro Stream a tributary of the Manganui River in the Waitara catchment... now known as Ngatoro-F wellsite	April 2002	June 2021
	5975-1	To discharge emissions into the air from hydrocarbon exploration and production testing operations and miscellaneous emissions at the Tabla-1 wellsite involving five wells and up to six zones per well ...now known as Ngatoro-F wellsite	June 2002	June 2021
Ngatoro-G	7934-1	To discharge treated stormwater and produced water onto land and into an unnamed tributary of the Ngatoronui Stream from hydrocarbon exploration and production operations at the Ngatoro-G wellsite	Aug 2014	June 2027
	7935-1	To take water from the Ngatoronui Stream and an unnamed tributary of the Ngatoronui Stream for wellsite and well drilling during hydrocarbon exploration and production activities at the Ngatoro-G wellsite	Oct 2011	June 2021
	7938-1	To discharge emissions to air during flaring from well workovers and in emergency situations and miscellaneous emissions associated with production activities at the Ngatoro-G wellsite	Oct 2011	June 2027
Goldie	5285-2	To discharge treated stormwater and treated produced water from hydrocarbon exploration and production operations at the Goldie wellsite into an unnamed tributary of the Waiongana Stream	Nov 2007	June 2026

Wellsite	Consent number	Purpose	Issue date	Expiry
	5286-3	To discharge contaminants to air from hydrocarbon exploration at the Goldie wellsite, including combustion involving flaring or incineration of petroleum recovered from natural deposits, in association with well development or redevelopment and testing or enhancement of well head production flows	Apr 2021	June 2038
Salisbury	7492-1	To discharge treated stormwater and treated production water from hydrocarbon exploration and production operations at the Salisbury wellsite onto and into land in the vicinity of an unnamed tributary of the Waitepuke Stream in the Waitara catchment	Jun 2009	June 2027
Salisbury	7494-1	To discharge emissions to air from flaring of hydrocarbons and miscellaneous emissions associated with well clean-up, initial well testing and production testing at the Salisbury wellsite	Sep 2009	June 2027
Surrey	6042-2	To discharge emissions to air from hydrocarbon exploration and production testing operations and miscellaneous emissions associated with up to three wells at the Surrey-1 wellsite	Jan 2008	June 2027
	6043-2	To discharge stormwater from hydrocarbon exploration and production operations at the Surrey-1 wellsite	Jan 2008	June 2027
Windsor	5668-2	To discharge treated stormwater from hydrocarbon exploration and production operations at the Windsor wellsite	Nov 2015	June 2032
	5669-2	To discharge contaminants to air from hydrocarbon exploration at the Windsor-1 wellsite, including combustion involving flaring or incineration of petroleum recovered from natural deposits, in association with well development or redevelopment and testing or enhancement of well production flows	Oct 2015	June 2032

* consent renewal underway

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 Kaimiro Production Station, Radnor Production Station and Ngatoro-A satellite site 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 each of the Kaimiro and Radnor production stations; two inspections at the Ngatoro-A satellite site; and an annual inspection of associated wellsites were conducted during the monitoring period. With regard to consents for the abstraction of or 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

The treated stormwater discharge from the Kaimiro Production Station was sampled twice, along with two sites in the unnamed tributary of the Mangaoraka Stream. The discharge from Ngatoro-A was also sampled twice during the year, with upstream and downstream sites in the Ngatoro Stream tributary sampled concurrently.

The Council undertook sampling of the ambient air quality outside the boundary of the Kaimiro Production Station site. Passive absorption discs were placed at two sites on one occasion to measure nitrogen oxides. A multi-gas meter was also 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).

1.4.5 Biomonitoring surveys

Two biological surveys were performed in two unnamed tributaries of the Mangaoraka Stream to determine whether or not the discharge of treated stormwater from the Kaimiro Production Station had had a detrimental effect upon the communities of the stream.

2 Results

2.1 Water

2.1.1 Inspections

Three inspections of the Kaimiro and Radnor production stations and the Ngatoro-A satellite site; and an annual inspection of associated wellsites were undertaken during the 2020-2021 monitoring period. The following was found during inspections:

31 August 2020

Kaimiro Production Station and Ngatoro-A:

Both sites were satisfactory with no issues noted.

14 September 2020

Radnor Production Station:

Ponded groundwater was noted on the western side of the site, this is an historic issue. It was noted that groundwater had been pumped from beneath the second skimmer pit onto land, with iron oxide staining observed in the grass in the adjacent paddock.

18 November 2020

Kaimiro Production Station:

The whole site was shut in at the time of inspection. All gas was being directed to the flare pit with a large flare and heat haze visible above the top of the flare bund. Smoke was not being generated and no offensive odours were detected at the time of inspection.

Radnor Production Station:

Good bunding practices were noted around the site and no sheens were observed. Discharge from the skimmer pits was clear. Rock weirs appeared to be working well, although it was noted that some of these required maintenance (cleaning).

Ngatoro-A:

No issues were noted during the inspection. Good bunding practices were in place and skimmer pits were free of sheens and clear. Long grasses in ring drains to help capture sediment. No flaring was occurring at the time of the inspection.

2 and 3 March 2021

Annual wellsite inspections:

An annual inspection of the well sites associated with the Kaimiro, Ngatoro and Radnor production stations was undertaken. The well sites inspected were Kaimiro-A, B, C, D, F, G, H, J, K, and O; Ngatoro-A, C, D and E; Goldie; Salisbury; Surrey; Windsor; York; and Radnor. In general the sites were tidy and clean with minimal activity occurring. The sites were being maintained, with weed spraying and grass cutting evident. The majority of ring drains were vegetated with grasses that helped with controlling and treating sediment laden stormwater.

Hydrocarbon sheen was not observed within the skimmer pits or in puddles on any of the sites. The majority of skimmer pits were all in good order with goose neck pipes functioning as required. The turbidity of the pits varied from clear to slightly turbid. The majority of the discharges were onto land before flowing to

surface water. 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 the inspection.

Specific points for the consent holder to note and if applicable, action, were: clean the bund below the storage vessels at Kaimiro-G because it contained hydrocarbon and staining. Monitor the area around the discharge pipe at Kaimiro-D to ensure the area does not erode.

30 April 2021

Kaimiro Production Station:

A pilot flare was operating. A heat haze from the flare pit was visible. No odours or smoke were noted.

Radnor Production Station:

The site was tidy with no activity noted. Discharge from the site was clear, with no effects observed below discharge point.

Ngatoro-A:

No activity was occurring on site at the time of the inspection. The site was tidy with no issues noted.

Photo 4 An additional unlined settling pond has been added in series with the existing two lined pits to further settle out suspended sediment prior to discharge

2.1.2 Results of discharge monitoring

2.1.2.1 Kaimiro Production Station

Recent stormwater upgrades at the site have included an additional sediment settling pond being added to the stormwater system (Photo 4). This discharges to the stream via a new pipe (STW002101) into the same

manhole as STW002016. The original connection from the skimmer pits (STW002016) will be retained so that during times of high rainfall the flow can come directly from the skimmer pits rather than flushing out the sediment settling pond.

Sampling of the discharge from the Kaimiro Production Station was undertaken twice during the 2020-2021 monitoring period.

Table 3 below presents the results along with the limits stipulated by consent 10722-1. The sampling sites are shown in Figure 1.

Both samples collected during the monitoring period were taken from the new stormwater discharge pipe STW002102. Chloride, hydrocarbons, pH and suspended solid concentrations all complied with consent conditions.

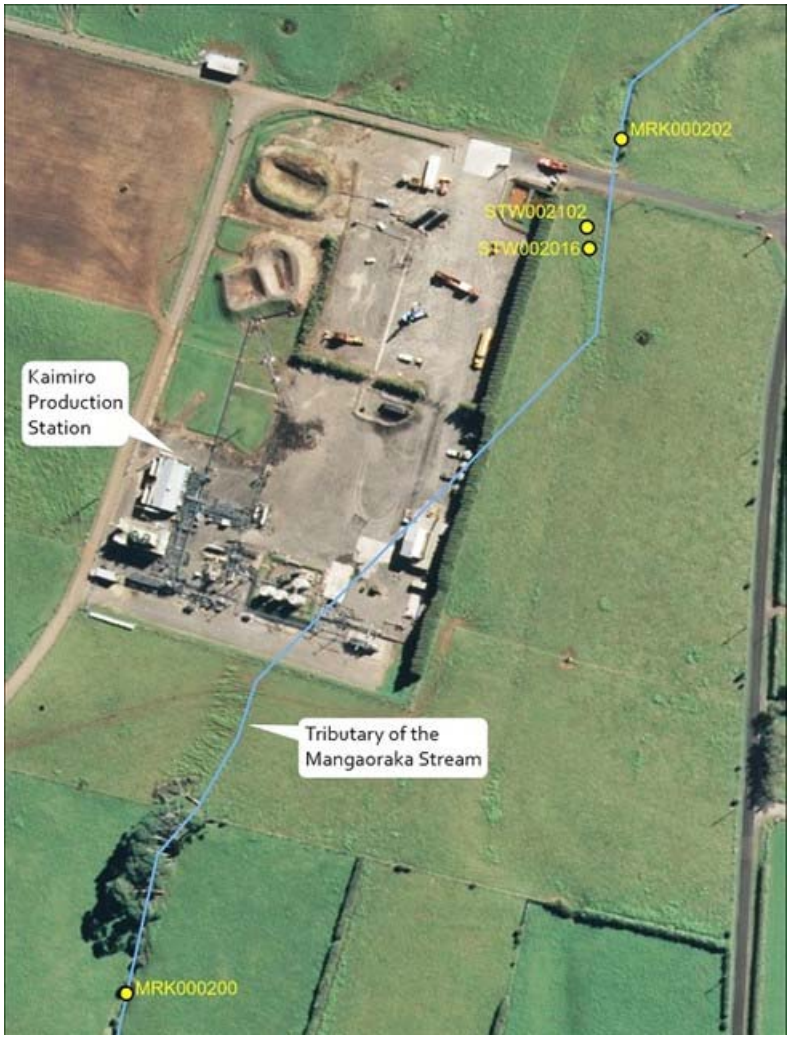

Figure 1 Water quality monitoring sites in relation to the Kaimiro Production Station

Table 3 Physicochemical results for discharge from the Kaimiro Production Station (TRC sites STW002016 and/or STW002102)

Parameter	Units	STW002102		Consent limits 10772-1
		19 August 2020	14 April 2021	
Chloride	g/m³	12	9	230
Conductivity	mS/m	8.5	6.9	-
Hydrocarbons	g/m³	< 0.7	< 0.7	15
pH		7.0	6.5	6.0 – 9.0*
Suspended solids	g/m³	6	27	100
Temperature	Deg. C	11.3	16.1	-
Turbidity	FNU	3.1	22	-

*pH may exceed 9.0 if due to photosynthetic activity within the skimmer pits

2.1.2.2 Ngatoro-A

The locations of water quality sampling sites in relation to Ngatoro-A are shown in Figure 2.

Figure 2 Water quality monitoring sites in relation to Ngatoro-A

Chemical water sampling of the discharge from Ngatoro-A was undertaken twice during the 2020-2021 monitoring period. Table 4 presents the results along with the consent limits.

Table 4 Results of discharge monitoring from Ngatoro-A (site IND002024)

Parameter	Units	21 August 2020	14 April 2021	Consent limits 4073-3
Chloride	g/m³	21	29	-
Conductivity	mS/m@25°C	28.0	35.5	-
Hydrocarbons	g/m³	< 0.7	< 0.7	15
pH		7.2	7.0	6.0 - 9.0*
Suspended solids	g/m³	< 3	< 3	100
Temperature	Deg. C	11.2	15.8	-
Turbidity	FNU	0.83	1.2	-

*pH may exceed 9.0 if due to photosynthetic activity within the skimmer pits

Levels of hydrocarbons, pH, and suspended solids in the discharge all complied with resource consent conditions. The chloride concentration in the discharge has remained low since 2016 because GPL no longer discharges treated production water via the stormwater system.

2.1.3 Results of receiving environment monitoring

2.1.3.1 Chemical

2.1.3.1.1 Kaimiro

Chemical water quality sampling of the unnamed tributary of the Mangaoraka Stream was undertaken in conjunction with discharge monitoring. These results are presented in Table 5, and the sampling sites are shown in Figure 1.

The results complied with the limits set by consent conditions for chloride and temperature increase.

Table 5 Results of receiving environment monitoring of an unnamed tributary of the Mangaoraka Stream in relation to the Kaimiro Production Station

Parameter	Units	Consent limits 10772-1	21 August 2020		14 April 2021	
			Upstream MRK000200	Downstream MRK000202	Upstream MRK000200	Downstream MRK000202
Chloride	g/m³	<50 g/m³ increase	17	17	13	13
Conductivity	mS/m @25°C	-	15.8	13.8	14.4	13.4
Hydrocarbons	g/m³	-	< 0.7	< 0.7	< 0.7	< 0.7
pH		-	6.7	6.8	6.3	6.4
Suspended solids	g/m³	-	< 4	< 3	< 3	7
Temperature	Deg. C	<2°C increase	13.0	12.6	15.1	15.7
Turbidity	FNU	-	0.77	3.5	1.2	4.9

2.1.3.1.2 Ngatoro

Chemical water quality sampling of the receiving environment at Ngatoro-A was undertaken in conjunction with discharge monitoring. The results are presented in Table 6 below.

Table 6 Results of receiving environment monitoring in relation to Ngatoro-A

Parameter	Units	Consent limits 4073-3	21 August 2020		14 April 2021	
			Upstream NGT000177	Downstream NGT000179	Upstream NGT000177	Downstream NGT000179
Chloride	g/m³	50	11	25	11	27
Conductivity	mS/m@ 25°C	-	12.2	17.5	12.2	19.2
Hydrocarbons	g/m³	-	< 0.7	< 0.7	< 0.7	< 0.7
pH		-	7.3	7.1	6.6	6.6
Suspended solids	g/m³	-	5	7	< 3	9
Temperature	Deg. C	<2°C increase	11.6	11.9	15.0	15.2
Turbidity	FNU	-	3.5	7.1	4.5	10

The results indicate that the discharge was having minimal effect on the water quality of the tributary of the Ngatoro Stream at the times of sampling. Chloride levels and temperature below the mixing zone were within consent limits on both occasions.

2.1.3.2 Biomonitoring

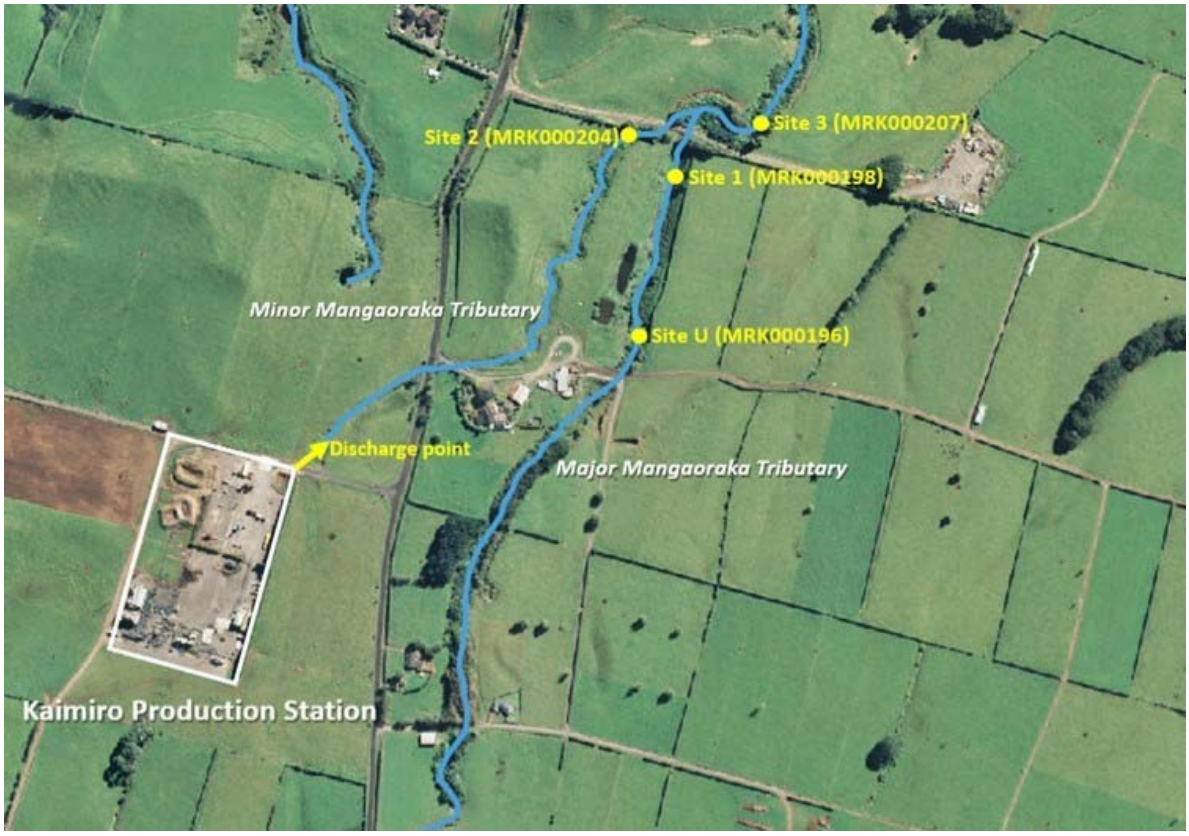

Figure 3 Biomonitoring sites in two unnamed tributaries of the Mangaoraka Stream

Table 7 Biomonitoring sites in two tributaries of the Mangaoraka Stream

Site number	Site code	Location
U	MRK000196	210m upstream of Kaimiro Production Station tributary
1	MRK000198	Major tributary approx. 50m u/s of confluence with minor tributary
2	MRK000204	Minor tributary (receives discharge) 150m d/s of Upland Road
3	MRK000207	Major tributary approx. 50m d/s of confluence with minor tributary

Benthic macroinvertebrates were collected from four sites in the two unnamed tributaries on 22 December 2020 and 22 February 2021, in relation to discharges from the Kaimiro Production Station (Figure 3, Table 7). This provided data to assess any potential impacts the consented discharges have had on the macroinvertebrate communities of the stream. Samples were processed to provide number of taxa (taxa richness), MCI and $SQMCI_S$ scores for each site.

Taxa richness is the most robust index when determining whether a macroinvertebrate community has been exposed to toxic discharges. Macroinvertebrates when exposed to toxic discharges may die and be swept downstream or may deliberately drift downstream as an avoidance mechanism (catastrophic drift). The MCI is a measure of the overall sensitivity of the macroinvertebrate community to organic pollution in stony streams. It is based on the presence/absence of taxa with varying degrees of sensitivity to environmental conditions. The $SQMCI_S$ takes into account relative abundances of taxa as well as sensitivity to pollution. Significant differences in taxa richness, MCI or $SQMCI_S$ between sites may indicate the degree of adverse effects (if any) of the discharge being monitored.

Significant differences in either the MCI or the $SQMCI_S$ between sites indicate the degree of adverse effects (if any) of the discharges being monitored.

22 December 2020

A moderately low richness of 12-18 taxa was recorded in the major Mangaoraka Stream tributary, while a low richness of six taxa was recorded in the minor Mangaoraka Stream tributary. Taxa numbers were within the ranges previously recorded, but were all below historic site medians. These results suggest a possible decline in health at the 'primary impact' site 2, but this may also be attributed to the habitat at this site. It would be expected that site 3 also record a lowered taxa richness, if a toxic discharge were present, however site 3 recorded the highest taxa richness of the four sites surveyed.

Sites U, 1 and 3 situated in the major Mangaoraka Stream tributary, recorded MCI scores reflective of 'good' macroinvertebrate community health. These results reflected a significant improvement in 'health' from the previous seven surveys, with sites 1 and 3 both recording scores above their respective site medians. Site 2, in the minor Mangaoraka Stream tributary recorded an MCI score reflective of 'fair' macroinvertebrate community health, which was significantly lower than that recorded at sites U, 1 and 3. However, this score was slightly above the median for the site and within the range of scores previously recorded. It should be noted, that the significant decline between the MCI scores recorded in the minor and major Mangaoraka Stream tributaries has been exacerbated by the recent improvements recorded in the major tributary and that subtle habitat differences between the two tributaries can explain some of the MCI differences recorded.

Site U recorded the highest SQMCI score of the four sites surveyed and was reflective of 'good' macroinvertebrate community health. The 'poor' SQMCI score recorded at site 1, was significantly lower than that recorded upstream at site U, however was significantly higher than that recorded by the previous survey and was higher than the median for the site. The SQMCI score at site 3 was reflective of 'good' macroinvertebrate community health, and was only slightly lower than that recorded at 'control' site U. This

suggests that the macroinvertebrate communities have possibly been affected by farm pond effluent discharges at site 1, however the effects were localised, with recovery evident further downstream at site 3. The SQMCI score at site 2 was reflective of 'fair' macroinvertebrate community health and was significantly higher than the median for the site, however significantly lower than that recorded at 'control' site U. However, given that the MCI and SQMCI at site 2 were both reflective of 'fair' macroinvertebrate community health and that habitat differences are evident between the minor and major Mangaoraka tributaries, it is unlikely that any discharges from the Kaimiro Production Station contributed to the lowered SQMCI score at site 2.

Overall, the MCI results of this survey indicated that the macroinvertebrate communities of the major Mangaoraka Stream tributary were in 'good' health, which was a significant improvement from the previous survey at sites 1 and 3. SQMCI scores also improved significantly from the previous survey and suggest recovery in the major Mangaoraka Stream tributary, which has been affected by farm pond effluent discharges over the past seven surveys. The primary impact site 2, recorded MCI and SQMCI scores that were significantly lower than those recorded at 'control' site U, however, were within the range of what has previously been recorded. The 'fair' MCI score recorded at site 2 was similar to the median for the site, while the SQMCI score was significantly higher than the median score. Four 'sensitive' taxa, including mayflies, which were 'abundant', were recorded at site 2, indicating reasonable preceding water quality at this site. Macroinvertebrate indices were similar between upstream 'control' site U and furthermost downstream site 3.

22 February 2021

Taxa richness was between 14-24 taxa in the major Mangaoraka Stream tributary. These numbers were much higher than that recorded at site 2 in the minor Mangaoraka Stream tributary, which recorded a low nine taxa. These results suggest a possible decline in health at the 'primary impact' site 2, but may also be attributed to the habitat at this site, which generally has less flow than the major tributary and a smaller available sampling area.

In the major Mangaoraka Stream tributary, site U recorded an MCI score reflective of 'poor' macroinvertebrate community health, while sites 1 and 3 recorded 'fair' health. These results reflected a significant decline in 'health' from the previous survey. MCI scores were below respective site medians at sites 1 and 3 in the major Mangaoraka Stream tributary. Site 2, in the minor Mangaoraka Stream tributary recorded an MCI score reflective of 'fair' macroinvertebrate community health. This score was higher than both the previous survey score, and median for the site. The MCI score recorded at site 2 was not significantly different to those recorded at sites 1 and 3, however was significantly higher than that recorded at 'control' site U. This differed from the previous survey in which the MCI recorded at site 2 was significantly lower than those recorded at the three sites in the major Mangaoraka tributary.

Site U recorded a 'poor' SQMCI score, which was significantly lower than those recorded by the previous two surveys. Site 1, approximately 165 m downstream of site U, recorded a 'fair' SQMCI score, which was significantly higher than that recorded upstream at site U. Subtle habitat differences, specifically slower flow at site U, may have influenced these results. The SQMCI score recorded at site 1 was also significantly higher than both the previous survey score and the median for the site and represented an improvement from 'poor' to 'fair' health from the previous survey. Site 3 recorded a SQMCI score reflective of 'fair' macroinvertebrate community health, which was not significantly different to those recorded upstream at sites U and 1. The SQMCI score of 3.0 units recorded at site 2 was reflective of 'poor' macroinvertebrate community health and was significantly lower than that recorded by the previous survey, although was higher than the median for the site. This score was lower than that recorded at upstream at sites U and 1, although not significantly.

Overall, the MCI results of this survey indicated that the macroinvertebrate communities of the major Mangaoraka Stream tributary were in 'poor' to 'fair' health, and had declined significantly from the previous

survey results. SQMCI scores also declined significantly from the previous survey at all three sites. These results may be explained by seasonal variation and flow conditions. Unlike the previous survey results, the SQMCI scores did not decrease in a downstream direction between sites U and 1. The 'primary impact' site 2, recorded MCI and SQMCI scores that were not significantly lower than those recorded at 'control' site U, and were within the range of what has previously been recorded.

Overall, there was no evidence that discharges from the Kaimiro Production Station have had any recent significant detrimental effects on the macroinvertebrate communities of the two unnamed tributaries of the Mangaoraka Stream.

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

2.1.4 Results of abstraction monitoring

Figure 4 provides a summary of the abstraction volumes for the consented water take at the Kaimiro-O wellsite under consent 5384-2. All daily volumes were well below the 550 m^3 limit stipulated by the consent.

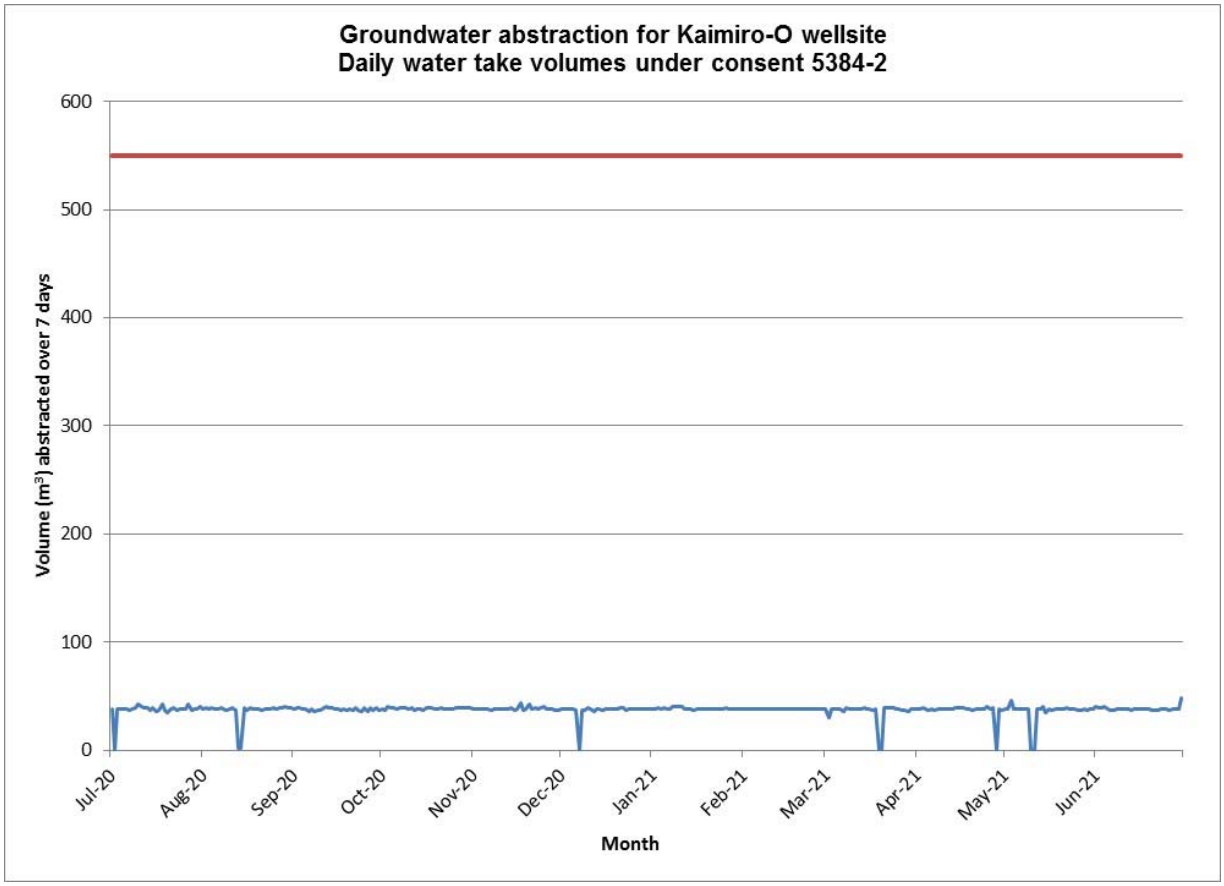

Figure 4 Daily water abstraction volumes for Kaimiro-O under consent 5384-2

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. On all occasions air discharges complied with consent conditions.

2.2.2 Results of 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 Kaimiro Production Station. The deployment lasted approximately 48 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 5.

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 8 and the data from the sample run are presented graphically in Figure 6. Figure 6 presents data as ppm (as per the instrumental read-out), while Table 8 presents data as mg/m^3.

Figure 5 Air monitoring sites at Kaimiro Production Station

The consents covering air discharges from the Kaimiro Production Station have specific limits related to particular gases. Special condition 13 of consent 4048-3 sets a limit on the carbon monoxide concentration at or beyond the production station's boundary. The limit is expressed as 10 mg/m^3 for an eight hour average or 30 mg/m^3 for a one hour average exposure. The momentary maximum concentration of carbon monoxide found during the monitoring run was 4.6 mg/m^3 while the average concentration for the entire dataset was 0.08 mg/m^3, 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 Kaimiro Production Station reach any more than a trivial level.

Table 8 Results of carbon monoxide and LEL monitoring at Kaimiro Production Station

Component		17 to 19 August 2020
Max	CO (ppm)	4.00(1)
	LEL (%)	0.10
Mean	CO (ppm)	0.07(1)
	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^3

(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

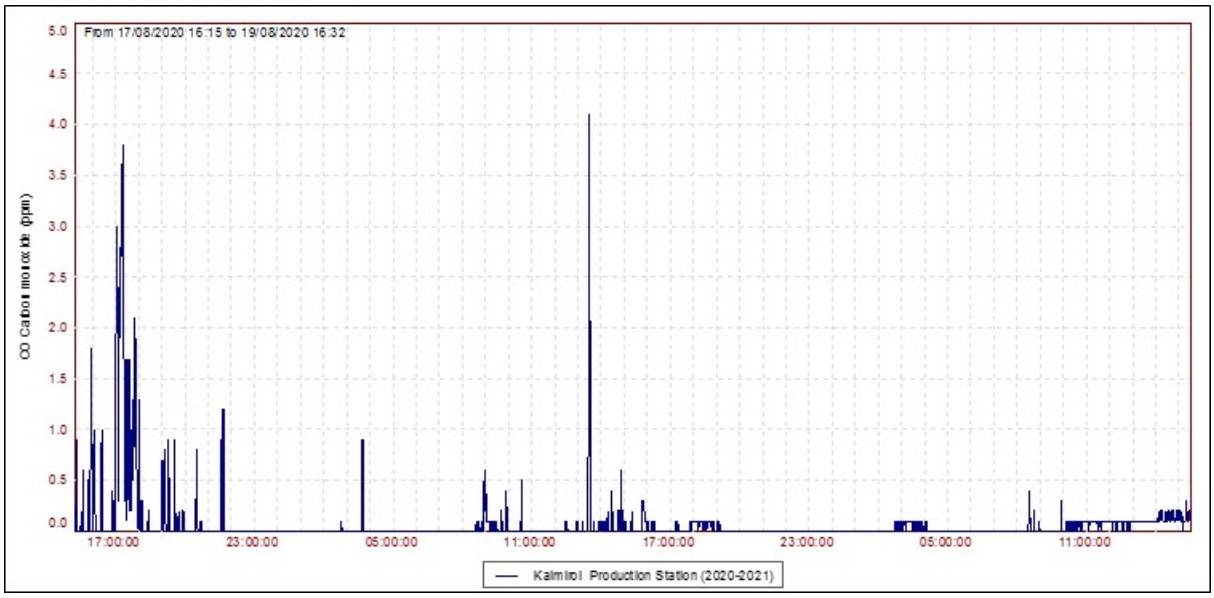

Figure 6 Ambient CO levels in the vicinity of Kaimiro Production Station

2.2.2.2 PM_{10} particulates

In September 2004 the Ministry for the Environment enacted National Environmental Standards (NESs) relating to certain air pollutants. The NES for PM_{10} particulates is 50 µg/m^3 (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_{10} 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_{10} 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_{10} monitor was deployed on one occasion in the vicinity of Kaimiro Production Station. The deployment lasted approximately 48 hours, with the instrument placed in a down-wind position at the start of the deployment. Monitoring consisted of continual measurements of

PM_{10} concentrations. The location of the DustTrak monitor during the sampling run is shown in Figure 5. The results of the sample run are presented in Figure 7 and Table 9.

Table 9 Daily averages of PM_{10} results from monitoring at Kaimiro Production Station

	17 to 19 August 2021 (49 hours)	
24 hr. set	Day 1 (start to 24 hours)	Day 2 (24 hours to end)
Daily average	15.0 µg/m³	13.0 µg/m³
NES	50 µg/m³	

During the 48 hour run, from 17 to 19 August 2021, the average recorded PM_{10} concentration was 15.0 µg/m³ for the first 24 hour period and 13.0 µg/m³ for the second 24 hour period. These daily averages equate to 30% and 26%, respectively, of the 50 µg/m³ value that is set by the NES. Background levels of PM_{10} in the region have been found to be typically around 11 µg/m³.

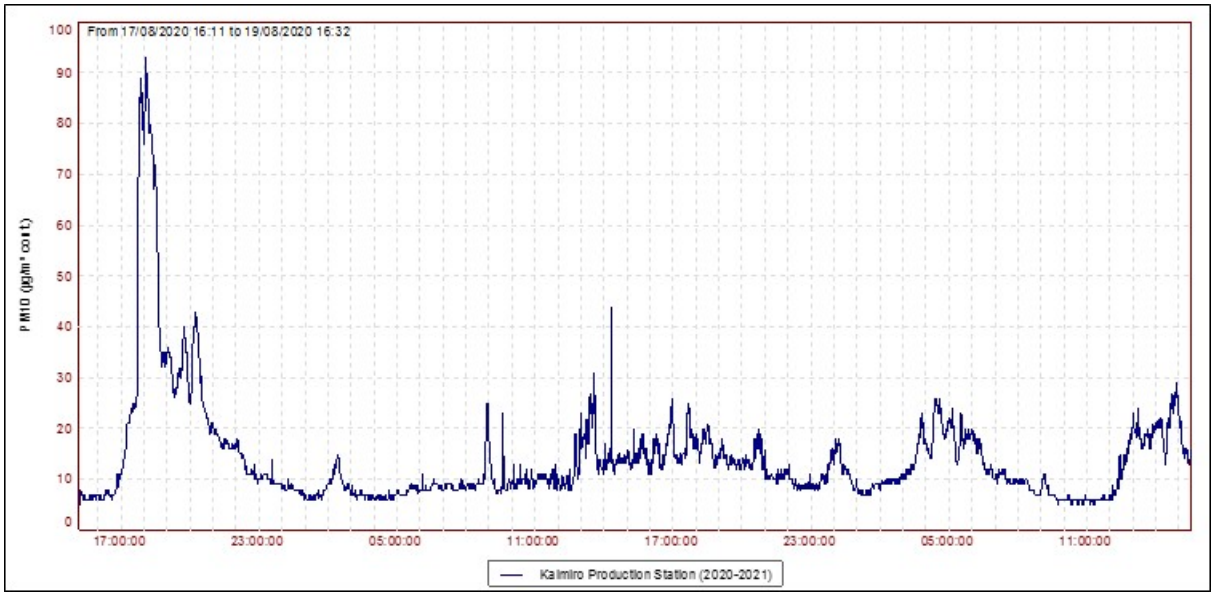

Figure 7 PM_{10} concentrations (µg/m³) at Kaimiro Production Station

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 Kaimiro 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 Kaimiro Production Station has specific limits related to particular gases. Special condition 14 of consent 4048-3 sets a limit on the nitrogen dioxide concentration at or beyond the production station's boundary. The limit is expressed as 200 µg/m³ for a one hour average or 100 µg/m³ for a 24 hour average exposure.

NOx passive adsorption discs were placed at two locations in the vicinity of the Kaimiro Production Station on one occasion during the year under review (Figure 2). The discs were left in place for a period of 21 days. The calculated average one hour and 24 hour theoretical maximum NOx concentrations found at Kaimiro Production Station during the year under review equate to 19.4 µg/m³ and 10.3 µg/m³, respectively. The

results show that the ambient ground level concentration of NOx is well below the limits set out by consent 4048-3.

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

2.2.3 Summary of flaring volumes reported by GPL

During the monitoring period regular flaring was undertaken at Kaimiro Production Station. Short periods of flaring (less than five minutes duration) occurred at Ngatoro-A occasionally due to unplanned outages. There was no flaring at Radnor Production Station or any of the other wellsites associated with the Kaimiro or Radnor production stations as these were either connected to a production station or not producing during the monitoring period.

A summary of flaring volumes at Kaimiro Production Station is provided in Figure 8.

At Kaimiro Production Station flaring occurred during most months of the year with approximately 227,200 m^3 flared. Flaring during the period occurred due to the Methanex plant shutdown, Kaimiro plant shutdown, power cuts, plant or well restarts, and compressor shutdowns and/or maintenance. No complaints were received regarding smoke emissions associated with flaring at the site.

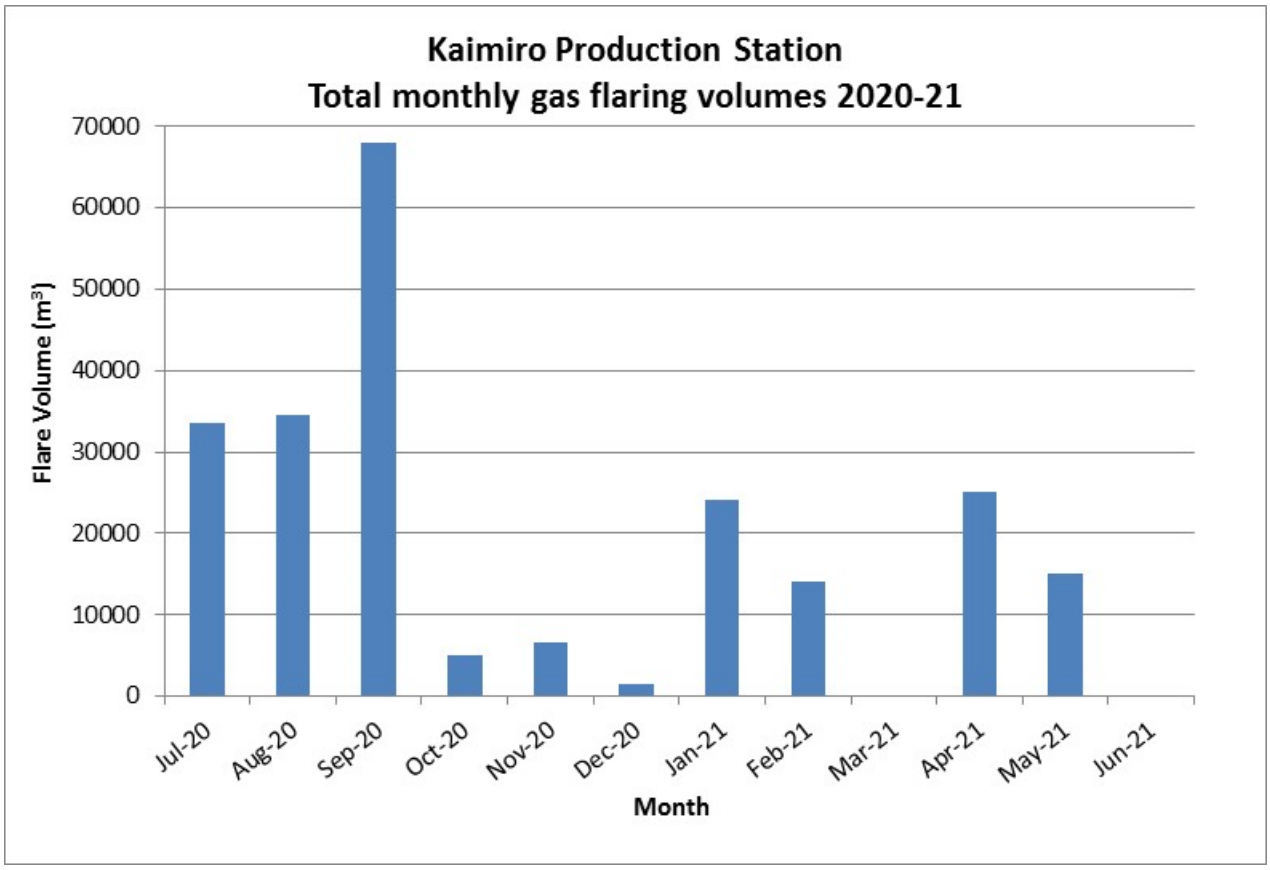

Figure 8 Summary of monthly gas flaring volumes at Kaimiro Production Station

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 2020-2021 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

Inspections of the Kaimiro, Radnor and Ngatoro sites during the 2020-2021 monitoring year found that they were generally well managed.

3.2 Environmental effects of exercise of consents

Kaimiro Production Station

Results of biomonitoring carried out in the Mangaoraka Stream indicated that the discharges from the production station were not having a significant adverse effect on the downstream water quality.

There were no adverse environmental effects recorded as a result of the exercise of the air discharge permit at the Kaimiro Production Station. The ambient air quality monitoring at the site showed that levels of carbon monoxide, combustible gases, PM_{10} 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.

Radnor Production Station

No adverse effects as a result of stormwater discharges or flaring were noted at the site during 2020-2021.

Ngatoro-A satellite site

Inspections of the site did not note any significant adverse effect on the downstream water quality.

The results of samples collected of the discharge and receiving waters complied with consent conditions.

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 10-17.

3.3.1 Kaimiro Production Station

Table 10 Summary of performance for consent 4048-3

Purpose: ***To discharge emissions into the air from the flaring of hydrocarbons***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Limit on flaring duration	Site inspections and company logs	Yes
2. Neighbours notified prior to flaring	Information provided to neighbours	Yes
3. Council notified of continuous flaring	Notifications received	Yes
4. Consultation prior to alteration to plant equipment or processes	Site inspections and liaison with consent holder	Yes
5. Regard given to wind conditions during flaring	Site inspections and liaison with consent holder	Yes

Purpose: *To discharge emissions into the air from the flaring of hydrocarbons*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
6. Gas treated by liquid and solid separation and recovery	Site inspections	Yes
7. No liquid or solid hydrocarbons combusted through gas flare	Site inspections	Yes
8. Flare only used to dispose of substances from the well stream	Site inspections	Yes
9. Hydrocarbon storage vessels fitted with vapour recovery systems	Site inspections	Yes
10. Best practicable option to prevent effects on environment	Site inspections	Yes
11. No offensive odour or smoke at boundary of site	Site inspections	Yes
12. Limit on smoke opacity	Site inspections	Yes
13. Limit on carbon monoxide emissions	Ambient gas monitoring	Yes
14. Limit on nitrogen dioxide emissions	Ambient gas monitoring	Yes
15. No discharge of contaminant that is hazardous, toxic or noxious beyond boundary	Site inspections and ambient gas monitoring	Yes
16. No discharge of contaminant that exceeds specific WES limits	Ambient gas monitoring	Yes
17. Record of smoke emitting incidents	Annual air report received	Yes
18. Provision of flaring logs to Council	Flaring logs received	Yes
19. Maintenance of flaring logs	Flaring logs received	Yes
20. Provision of annual air emissions report	Report received	Yes
21. Analysis of gas and crude oil stream	Not requested during period under review	N/A
22. Provisions for review of consent conditions	No further provision for review prior to expiry	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**High** **High**

N/A = not applicable

Table 11 Summary of performance for consent 5384-2

Purpose: *To take groundwater from the Matemateaonga Formation*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Total volume abstracted not to exceed 550 m^3/day or 6.4 L/s	Review of data provided by consent holder	Yes
2. Bore to be labelled	Site inspection	Yes
3. Installation and maintenance of water meter and datalogger	Site inspections	Yes
4. Provision of data annually by 31 July	Data provided	Yes
5. Documentation proving equipment has been installed and is accurate	Certification achieved	Yes
6. Water meter and datalogger to be accessible to Council staff	Site inspections	Yes
7. Council to be notified if equipment breaks down	No issues during the period	Yes
8. Best practicable option to prevent or minimise adverse environmental effects	Site inspections and liaison with consent holder	Yes
9. Lapse of consent		N/A
10. Provisions for review of consent conditions	Optional review June 2026	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

N/A = not applicable

Table 12 Summary of performance for consent 10772-1

Purpose: *To discharge treated stormwater from hydrocarbon exploration and production operations at the Ngatoro-A wellsite, onto land and into an unnamed tributary of the Ngatoro Stream*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Exercise of consent undertaken in general accordance with information provided in application	Site inspections	Yes
2. Best practicable option to prevent effects on environment	Site inspections	Yes
3. Maximum stormwater catchment	Site inspections	Yes

Purpose: *To discharge treated stormwater from hydrocarbon exploration and production operations at the Ngatoro-A wellsite, onto land and into an unnamed tributary of the Ngatoro Stream*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
4. Consent holder to maintain and regularly update a contingency plan	Plan up-to-date	Yes
5. Design, management and maintenance of stormwater system in accordance with application	Site inspections	Yes
6. All discharge from the site to flow through a perimeter drain and skimmer pit	Site inspections	Yes
7. Skimmer pits to be lined with an impervious material and be fitted with a shut off valve	Site inspections	Yes
8. Limits on contaminants in the discharge	Water sampling	Yes
9. pH may exceed 9.0 if due to photosynthetic activity in the skimmer pits	Water sampling	Yes
10. Consent holder shall provide access upstream of discharge	Access provided	Yes
11. Limits on chloride, BOD and temperature increase below mixing zone	Water sampling	Yes
12. Effects on stream below mixing zone	Inspections and biomonitoring	Yes
13. Provisions for review of consent conditions	Option for review in June 2026	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**High** **High**

N/A = not applicable

3.3.2 Radnor Production Station

Table 13 Summary of performance for consent 6394-1

Purpose: ***To discharge emissions to air during flaring from well workovers, in emergency situations, from a permanent pilot flame and other miscellaneous emissions associated with production activities at the Radnor-B wellsite***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Notify Council prior to establishment of production operations	Notification received	Yes
2. Neighbours notified prior to flaring	Information provided to neighbours	Yes
3. Council notified of continuous flaring	Notifications received	Yes
4. Consultation prior to alteration to plant equipment or processes	Site inspections	Yes
5. Regard given to wind conditions during flaring	No complaints received from neighbours	Yes
6. Gas treated by liquid and solid separation and recovery	Site inspections	Yes
7. Notify Council of any failure to maintain liquid and solid separation	No failure during monitoring period	N/A
8. No liquid or solid hydrocarbons combusted through gas flare	Site inspections	Yes
9. Flare only used to dispose of substances from the well stream	Site inspections	Yes
10. Best practicable option to prevent effects on environment	Site inspections	Yes
11. No discharge of contaminant that is hazardous, toxic or noxious beyond boundary	Site inspections	Yes
12. No offensive odour or smoke at boundary of site	Site inspections	Yes
13. Hydrocarbon storage vessels fitted with vapour recovery systems	Site inspections	Yes
14. Limit on smoke opacity	Not assessed during monitoring period	N/A
15. Limit on carbon monoxide emissions	Not assessed during monitoring period	N/A
16. Limit on nitrogen dioxide emissions	Not assessed during monitoring period	N/A
17. No discharge of contaminant that exceeds specific WES limits	No assessed during monitoring period	N/A

Purpose: *To discharge emissions to air during flaring from well workovers, in emergency situations, from a permanent pilot flame and other miscellaneous emissions associated with production activities at the Radnor-B wellsite*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
18. Record of smoke emitting incidents	Flaring logs received	Yes
19. Maintenance of flaring logs	Flaring logs received	Yes
20. Supply monthly flaring information to Council	Flaring logs received	Yes
21. Provision of annual air emissions report	Report received	Yes
22. Analysis of gas and crude oil stream	Not requested	N/A
23. Lapse of consent	Consent exercised within lapse period	N/A
24. Provisions for review of consent conditions	No further option to review prior to expiry	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**High** **High**

N/A = not applicable

Table 14 Summary of performance for consent 6399-1

Purpose: *To take water from the Piakau Stream for hydrocarbon exploration purposes associated with the Radnor-B wellsite*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Best practicable option to prevent or minimise adverse environmental effects	Site inspections and liaison with consent holder	Yes
2. Notify Council prior to abstraction	No abstraction during period under review	N/A
3. Total volume abstracted not to exceed 100 m^3/day or 25 L/s	No abstraction during period under review	N/A
4. Abstraction to cease when flow in Piakau Stream is below 45 L/sec	No abstraction during period under review	N/A
5. Maintenance of abstraction records	No abstraction during period under review	N/A
6. Exercise of consent in accordance with application	No abstraction during period under review	N/A
7. Intake structure to be screened	No abstraction during period under review	N/A
8. Lapse of consent	Consent exercised within lapse period	N/A

Purpose: *To take water from the Piakau Stream for hydrocarbon exploration purposes associated with the Radnor-B wellsite*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
9. Provisions for review of consent conditions	No further provision for review prior to expiry	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

N/A = not applicable

Table 15 Summary of performance for consent 9966-1

Purpose: *To discharge treated stormwater from hydrocarbon exploration and production operations at the Radnor-B wellsite through a roadside drain into an unnamed tributary of the Piakau Stream*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Best practicable option to prevent effects on environment	Site inspections	Yes
2. Wellsite pad maximum size 2 ha	Site inspections	Yes
3. Consent holder to notify Council of site works or well drilling operations	Notification received	Yes
4. Consent holder to maintain and regularly update a contingency plan	Plan up-to-date	Yes
5. Design, management and maintenance of stormwater system in accordance with application	Site inspections	Yes
6. Consent holder to take reasonable steps to prevent stormwater entering the site from adjacent land	Site inspections	Yes
7. All discharges to flow to a perimeter drain and skimmer pit	Site inspections	Yes
8. Skimmer pit capacity at least 112.5 m^3	Site inspections	Yes
9. Skimmer pits to be lined with an impervious material and be fitted with a shut off valve	Site inspections	Yes
10. Perimeter drains and skimmer pits to be installed before any site works commence	Site inspections	Yes
11. Limits on contaminants in the discharge	Not assessed during period under review	N/A

Purpose: *To discharge treated stormwater from hydrocarbon exploration and production operations at the Radnor-B wellsite through a roadside drain into an unnamed tributary of the Piakau Stream*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
12. pH may exceed 9.0 if due to photosynthetic activity in the skimmer pits	Not assessed during period under review	N/A
13. Limits on chloride, BOD and temperature increase below mixing zone	Not assessed during period under review	N/A
14. Effects on stream below mixing zone	Inspections	Yes
15. Council advised prior to reinstatement of the site	Site not reinstated during period under review	N/A
16. Consent lapse	Consent exercised	N/A
17. Provisions for review of consent conditions	Option for review in November 2022	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**High** **High**

N/A = not applicable

3.3.3 Ngatoro-A satellite site

Table 16 Summary of performance for consent 4073-3

Purpose: *To discharge treated stormwater from hydrocarbon exploration and production operations at the Ngatoro-A wellsite, onto land and into an unnamed tributary of the Ngatoro Stream*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Best practicable option to prevent effects on environment	Site inspections	Yes
2. Maximum stormwater catchment	Site inspections	Yes
3. Consent holder to notify Council of site works or well drilling operations	No works during period under review	Yes
4. Consent holder to maintain and regularly update a contingency plan	Plan up-to-date as of December 2017	Yes
5. Design, management and maintenance of stormwater system in accordance with application	Site inspections	Yes
6. All discharge from the site to flow through a perimeter drain and skimmer pit	Site inspections	Yes

Purpose: *To discharge treated stormwater from hydrocarbon exploration and production operations at the Ngatoro-A wellsite, onto land and into an unnamed tributary of the Ngatoro Stream*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
7. Skimmer pit capacity at least 102m^3	Site inspections	Yes
8. Skimmer pits to be lined with an impervious material and be fitted with a shut off valve	Site inspections	Yes
9. Perimeter drains and skimmer pits to be installed before any site works commence	Site inspections	Yes
10. Limits on contaminants in the discharge	Water sampling	Yes
11. pH may exceed 9.0 if due to photosynthetic activity in the skimmer pits	Water sampling	Yes
12. Limits on chloride, BOD and temperature increase below mixing zone	Water sampling	Yes
13. Effects on stream below mixing zone	Inspections	Yes
14. Council advised prior to reinstatement of the site	Site not reinstated during period under review	N/A
15. Provisions for review of consent conditions	No further option for review prior to expiry	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**High** **High**

N/A = not applicable

Table 17 Summary of performance for consent 7295-1

Purpose: *To discharge emissions into the air during flaring at the Ngatoro wellsite*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Council notified of continuous flaring	Liaison with consent holder – flaring occasional short duration (less than 5 minutes) only	Yes
2. Neighbours notified prior to flaring	Liaison with consent holder – flaring occasional short duration (less than 5 minutes) only	Yes
3. Consultation prior to alteration to plant equipment or processes	Site inspections	Yes
4. Regard given to wind conditions during flaring	Liaison with consent holder – flaring occasional short duration (less than 5 minutes) only	Yes
5. Gas treated by liquid and solid separation and recovery	Site inspections	Yes

Purpose: *To discharge emissions into the air during flaring at the Ngatoro wellsite*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
6. Notify Council of any failure to maintain liquid and solid separation	Liaison with consent holder – flaring occasional short duration (less than 5 minutes) only	Yes
7. No liquid or solid hydrocarbons combusted through gas flare	Liaison with consent holder – flaring occasional short duration (less than 5 minutes) only	Yes
8. Best practicable option to prevent effects on environment	Site inspections	Yes
9. Flare only used to dispose of substances from the well stream	Site inspections	Yes
10. No offensive odour or smoke at boundary of site	Site inspections	Yes
11. Hydrocarbon storage vessels fitted with vapour recovery systems	Site inspections	Yes
12. Limit on smoke opacity	Not assessed during period under review	N/A
13. Limit on carbon monoxide emissions	Not assessed during period under review	N/A
14. Limit on nitrogen dioxide emissions	Not assessed during period under review	N/A
15. No discharge of contaminant that is hazardous, toxic or noxious beyond boundary	Not assessed during period under review	N/A
16. No discharge of contaminant that exceeds specific WES limits	Not assessed during period under review	N/A
17. Analysis of gas and crude oil stream	Not requested during monitoring period	N/A
18. Record of smoke emitting incidents	Report received	Yes
19. Maintenance of flaring logs	Report received	Yes
20. Provision of annual air emissions report	Report received	Yes
21. Lapse of consent	Consent exercised within lapse period	N/A
22. Provisions for review of consent conditions	No further option for review prior to expiry	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent		**High**
Overall assessment of administrative performance in respect of this consent		**High**

N/A = not applicable

Table 18 Evaluation of environmental performance over time

Year	Consent no	High	Good	Improvement req	Poor
2011-12	1334-3, 4048-3, 5384-1, 6218-1	4	-	-	-
	4073-2, 7295-1	2	-	-	-
	3951-2, 7220-1	2	-	-	-
2012-13	1334-3	-	1	-	-
	4048-3, 5384-1, 6218-1	3	-	-	-
	4073-2, 7295-1	2	-	-	-
	3951-37220-1	2	-	-	-
2013-14	1334-3	-	-	1	-
	4048-3, 5384-1, 6218-1	3	-	-	-
	4073-2	-	1	-	-
	7295-1	1	-	-	-
	3951-3, 7220-1	2	-	-	-
2014-15	1334-3, 4048-3, 5384-2	3	-	-	-
	4073-2, 7295-1	2	-	-	-
	3951-3, 7220-1	2	-	-	-
2015-16	1334-3, 4048-3, 5384-2	3	-	-	-
	4073-2, 7295-1	2	-	-	-
	3951-3, 7220-1	2	-	-	-
2016-17	1334-3, 4048-3, 5384-2	3	-	-	-
	4073-2, 7295-1	2	-	-	-
	3951-3, 7220-1	2	-	-	-
2017-18	1334-3, 4048-3, 5384-2	3	-	-	-
	4073-2, 7295-1	2	-	-	-
	6394-1, 6399-1	2	-	-	-
	9966-1	-	1	-	-
2018-19	1334-3, 4048-3, 4073-2, 5384-2, 6394-1, 6399-1, 7295-1	7	-	-	-
	9966-1	-	1	-	-
2019-20	1334-3, 4048-3, 4073-2, 5384-2, 6394-1, 6399-1, 7295-1, 9966-1, 10772-1	9	-	-	-
Totals		65	4	1	-

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.

3.4 Recommendations from the 2019-2020 Annual Report

In the 2019-2020 Annual Report, it was recommended:

1. THAT in the first instance, monitoring of consented activities at Kaimiro Production Station, Radnor Production Station and the Ngatoro-A satellite site in the 2020-2021 year continue at the same level as in 2019-2020.
2. THAT should there be issues with environmental or administrative performance in 2020-2021, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.
3. THAT the option for a review of resource consent 7295-1 in June 2021, as set out in condition 22 of the consent, not be exercised, on the grounds that the current conditions are adequate.

Recommendations one and three were implemented, while it was not considered necessary to undertake additional investigations or monitoring as per recommendation two.

3.5 Alterations to monitoring programmes for 2021-2022

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.

No changes are planned for the 2021-2022 monitoring programme.

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 2021-2022.

4 Recommendations

1. THAT in the first instance, monitoring of consented activities at Kaimiro Production Station, Radnor Production Station and the Ngatoro-A satellite site in the 2021-2022 year continue at the same level as in 2020-2021.
2. THAT should there be issues with environmental or administrative performance in 2021-2022, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

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.
BOD	Biochemical oxygen demand. A measure of the presence of degradable organic matter, taking into account the biological conversion of ammonia to nitrate.
BODCF	Filtered carbonaceous biochemical oxygen demand. A measure of the presence of degradable organic matter, excluding the biological conversion of ammonia to nitrate.
Bund	A wall around a tank to contain its contents in the case of a leak.
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^3	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.
L/s	Litres per second.
LEL	Lower Explosive Limit. The percentage of the lower explosive limit, expressed as methane that is detected in the air sampled.
m^2	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 Standards
NO_x	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_{10}	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	*Resource Management Act 1991* 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.

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Appendix I

Resource consents held by Greymouth Petroleum

(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 Acquisition Company Limited P O Box 3394 NEW PLYMOUTH 4341
Consent Granted Date:	10 January 2008

Conditions of Consent

Consent Granted:	To discharge emissions into the air from the flaring of hydrocarbons arising from hydrocarbon production and processing operations, together with miscellaneous emissions, at the Kaimiro Production Station at or about 2609726E-6225978N
Expiry Date:	1 June 2026
Review Date(s):	June 2014, June 2020
Site Location:	Upland Road, Inglewood
Legal Description:	Pt Sec 115 Tarurutangi Dist Blk III Egmont 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

Duration

1. Flaring of gas from each well during well testing shall not occur on more than 30 days.

Information and notification

2. At least 24 hours before any flaring, other than in emergencies, the consent holder shall provide notification to all 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 complaints received.

3. The consent holder shall 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 be no less than 24 hours before the flaring commences. Notification shall include the consent number and be emailed to worknotification@trc.govt.nz. Notification by fax or post is acceptable if the consent holder does not have access to email.

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 authorised by this consent , without prior consultation with the Chief Executive, Taranaki Regional Council.

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, and throughout, any episode of flaring so as to minimise offsite effects.

6. All gas that is flared must first be treated by effective liquid and solid separation and recovery to ensure that smoke emission during flaring is minimised.

7. No liquid or solid hydrocarbons shall be combusted through the gas flare system.

8. Only substances originating from the well stream and treated as outlined by conditions 6 and 7 shall be combusted within the flare pit.

9. All hydrocarbon storage vessels shall be fitted with vapour recovery systems.

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 Kaimiro Production Station.

11. There shall not be any offensive odour or smoke at or beyond the boundary of the property where the production station is located.

12. The opacity of any smoke emissions shall not exceed a level of 1 as measured on the Ringelmann Scale.

13. The consent holder shall control all emissions of carbon monoxide to the atmosphere from the flare so that, whether alone or in conjunction with any other emissions from the production station, the maximum ground level concentration of carbon monoxide arising from the exercise of this consent measured under ambient conditions does not exceed 10 milligrams per cubic metre [mg/m^3] [eight-hour average exposure], or 30 mg/m^3 one-hour average exposure] at or beyond the boundary of the property.

14. The consent holder shall control all emissions of nitrogen oxides to the atmosphere from the flare so that, whether alone or in conjunction with any other emissions from the production station, 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 [$\mu g/m^3$][24-hour average exposure], or 200 $\mu g/m^3$ [1-hour average exposure] at or beyond the boundary of the of the property.

15. The consent holder shall control emissions to the atmosphere, from the production station and flare, of contaminants other than carbon dioxide, carbon monoxide, and nitrogen oxides so that, whether alone or in conjunction with any other emissions from the production station, is not hazardous or toxic or noxious at or beyond the boundary of the property.

16. The consent holder shall control emissions to the atmosphere from the production station and flare of contaminants other than carbon dioxide, carbon monoxide, and nitrogen oxides so that, whether alone or in conjunction with any emissions from the flare, the maximum ground level concentration for any particular contaminant arising from the exercise of this consent measured at or beyond the boundary of the property, is not increased above background levels:

a) by more than 1/30th 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

17. Each time there is visible smoke as a result of the exercise of this consent, the consent holder shall record the time, duration and cause. The consent holder shall make the record available to the Chief Executive, Taranaki Regional Council, upon request.

18. Each month, the consent holder shall supply to the Chief Executive, Taranaki Regional Council a record of flaring information in relation to the production station, and each wellsite. The flaring information supplied shall comprise: 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 the flaring events.

19. The consent holder shall record and maintain a log of all continuous flaring events longer than five minutes duration, and any intermittent flaring lasting for an aggregate of ten minutes or longer in any 120-minute period. The log shall contain the date, the start and finish times of the flaring event, the quantity and type of material flared, and the reason for flaring. The 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 17;
iii) detailing any measures undertaken or proposed to reduce smoke emissions;
iv) detailing any measures undertaken or proposed 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 condensate stream from the field, covering sulphur compound content and the content of carbon compounds of structure C_6 or higher number of compounds.

Review

22. 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 within six months of receiving a report prepared by the consent holder pursuant to condition 20 of this consent, and/or by giving notice of review during the month of June 2014 and/or June 2020, for any of the following purposes:

    a) dealing with any significant adverse effect on the environment arising from the exercise of the consent which was not foreseen at the time the application was considered or which it was not appropriate to deal with at the time;
    b) requiring the consent holder to adopt the best practicable option to remove or reduce any adverse effect on the environment caused by the discharge;
    c) to alter, add or delete limits on mass discharge quantities or discharge or ambient concentrations of any contaminant;
    d) taking into account any Act of Parliament, regulation, national policy statement or national environmental standard which relates to limiting, recording, or mitigating emissions of gases which are products of combustion, and which is relevant to the air discharge from the Kaimiro Production Station.

Signed at Stratford on 10 January 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:	Greymouth Petroleum Acquisition Company Limited PO Box 3394 New Plymouth 4341
Decision Date:	30 June 2016
Commencement Date:	30 June 2016

Conditions of Consent

Consent Granted:	To discharge treated stormwater from hydrocarbon exploration and production operations at the Ngatoro-A wellsite, onto land and into an unnamed tributary of the Ngatoro Stream
Expiry Date:	1 June 2021
Review Date(s):	June 2019
Site Location:	Ngatoro-A wellsite, 561 Dudley Road, Inglewood
Grid Reference (NZTM)	1701212E-5659859N
Catchment:	Waitara
Tributary:	Manganui Ngatoro

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 7000 m^2.

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.

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.

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 102 m^3 including a 'freeboard' of no less than 59 m^3, and be designed to retain any hydrocarbons that enter them.

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.

Constituent	Standard
pH	Within the range 6.0 to 9.0
suspended solids	Concentration not greater than 100 gm^{-3}
total recoverable hydrocarbons	Concentration not greater than 15 gm^{-3} [as determined by infrared spectroscopic technique]

This condition shall apply before the entry of the treated stormwater into the receiving environment at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

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 25 metres.

12. After allowing for a mixing zone of 25 metres from the point of discharge into the unnamed tributary of the Ngatoro 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^{-3}; or

    c) the chloride concentration to exceed 50 gm^{-3}.

13. After allowing for a mixing zone of 25 metres from the point of discharge into the unnamed tributary of the Ngatoro 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.

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.

15. 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 2019 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 30 June 2016

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Water 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 Acquisition Company Limited PO Box 3394 New Plymouth 4341
Decision Date:	24 July 2014
Commencement Date:	24 July 2014

Conditions of Consent

Consent Granted:	To take groundwater from the Matemateaonga Formation for use in enhanced hydrocarbon recovery activities at the Kaimiro-O wellsite
Expiry Date:	01 June 2032
Review Date(s):	June 2020, June 2026
Site Location:	Kaimiro-O wellsite, 455 Alfred Road, Egmont Village (Property owner: St Leger Manning Reeves & Robert Baker)
Legal Description:	Pt Sec 115-116 Hua & Waiwhakaiho Hun (Site of take)
Grid Reference (NZTM)	1698651E-5663191N
Catchment:	Waiwhakaiho

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 total volume of water taken from the bore shall not exceed 550 cubic metres per day and/or 6.4 litres/second.

2. The bore shall be easily identifiable by permanent labels, which may be welded or engraved on the casing, or on the equivalent fixed part of the bore construction or associated building. The numbering on the label shall be the bore number assigned by the Taranaki Regional Council (GND2456).

3. Prior to exercising this consent the consent holder shall install, and thereafter maintain a water meter and a datalogger at the site of taking. The water meter and datalogger shall be tamper-proof and shall measure and record the rate and volume of water taken to an accuracy of ± 5%.

   Note: Water meters and dataloggers must be installed, and regularly maintained, in accordance with manufacturer's specifications in order to ensure that they meet the required accuracy. Even with proper maintenance water meters have a limited lifespan.

4. The records of water taken shall:
   a. be in a format that, in the opinion of the Chief Executive, Taranaki Regional Council, is suitable for auditing;
   b. specifically record the water taken as 'zero' when no water is taken; and
   c. for each 12-month period ending on 30 June, be provided to the Chief Executive, Taranaki Regional Council within one month after end of that period.

5. Within 30 days of the installation of a water meter or datalogger, and at other times when reasonable notice is given, the consent holder shall provide the Chief Executive, Taranaki Regional Council with a document from a suitably qualified person certifying that:
   a. water measuring or recording equipment required by the conditions of this consent has been installed and/or maintained in accordance with the manufacturer's specifications; and/or
   b. water measuring or recording equipment required by the conditions of this consent has been tested and shown to be operating to an accuracy of ± 5%.

6. The water meter and datalogger shall be accessible to Taranaki Regional Council officer's at all reasonable times for inspection and/or data retrieval.

7. If any measuring or recording equipment breaks down, or for any reason is not operational, the consent holder shall advise the Chief Executive, Taranaki Regional Council immediately. Any repairs or maintenance to this equipment must be undertaken by a suitably qualified person.

8. At all times the consent holder shall adopt the best practicable option (BPO) to prevent or minimise any actual or likely adverse effect on the environment associated with the abstraction of groundwater, including, but not limited to, the efficient and conservative use of water.

9. This consent shall lapse on 30 September 2019, 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.

10. 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 2020 and/or June 2026 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 24 July 2014

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:	Bridge Petroleum Limited General Manager P O Box 112341 Penrose AUCKLAND
Change To Conditions Date:	31 July 2006 [Granted: 10 June 2004]

Conditions of Consent

Consent Granted:	To discharge emissions to air during flaring from well workovers, in emergency situations, from a permanent pilot flame and other miscellaneous emissions associated with production activities at the Radnor-B wellsite at or about GR: Q20:192-109
Expiry Date:	1 June 2022
Review Date(s):	June 2010, June 2016
Site Location:	Radnor-B Wellsite, Radnor Road, Midhirst [Property owner: AB & LH Crofskey]
Legal Description:	Lot 23 DP 18 Sec 47 Manganui Dist Blk XIII Huiroa 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

Conditions 1 to 12 – unchanged

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 Radnor-B 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 are to 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 Radnor-B 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.

Condition 13 – changed

13. All hydrocarbon storage vessels shall be fitted with vapour recovery systems as soon as practicable, but no later than 6th May 2007.

Conditions 14 to 24 – unchanged

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^3 [eight-hour average exposure], or 30 mg/m^3 one-hour average exposure] at or beyond the boundary of the wellsite or beyond 100 metres from the flare, whichever distance is greater.

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 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.

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 $1/30^{th}$ 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 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.

21. 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 gas combustion in the flare;
    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, particularly but without limitation to gas capture and transfer, how these might be applicable and/or implemented at the site, and the benefits and costs of these advances.

22. 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_6 or higher number of compounds.

Lapse and Review

23. 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.

24. 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 2010 and/or June 2016, 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 31 July 2006

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:	Greymouth Petroleum Limited P O Box 3394 NEW PLYMOUTH 4341
Consent Granted Date:	12 May 2008

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 Ngatoro-A wellsite at or about 2611074E-6221732N
Expiry Date:	1 June 2027
Review Date(s):	June 2015, June 2021
Site Location:	Ngatoro-A wellsite, Dudley Road, Inglewood [Property owners: GD & VK Robinson]
Legal Description:	Sec 11 Blk VIII Egmont 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, whenever the continuous flaring of hydrocarbons [other than purge gas] is expected to occur for more than five minutes in duration. Notification shall be no less than 24 hours before the flaring commences. Notification shall include the consent number and be emailed to worknotification@trc.govt.nz. Notification by fax or post is acceptable if the consent holder does not have access to email.

2. At least 24 hours before any flaring, other than in emergencies, the consent holder shall provide notification to all 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 complaints received in respect of any flaring activity.

3. 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 authorised by this consent , without prior consultation with the Chief Executive, Taranaki Regional Council.

Emissions from the site

4. 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, and throughout, any episode of flaring so as to minimise offsite effects.

5. All gas that is flared must first be treated by effective liquid and solid separation and recovery to ensure that smoke emission during flaring is minimised.

6. If separation required by special condition 5 cannot be implemented or maintained at any time while there is a flow from the well, whether natural or induced, then the consent holder shall immediately advise the Compliance Manager, Taranaki Regional Council, and shall in any case re-establish liquid and solid separation and recovery within three hours.

7. Subject to special condition 6, no liquid or solid hydrocarbons shall be combusted through the gas flare system, other than in an emergency.

8. 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 Ngatoro-A wellsite [including use of a separator during well clean-up].

9. Only substances originating from the well stream and treated as outlined by conditions 5, 6, 7, and 8 shall be combusted within the flare pit.

10. There shall not be any offensive odour or smoke, as determined by an enforcement officer of the Taranaki Regional Council, at or beyond the boundary of the property where the wellsite is located.

11. All hydrocarbon storage vessels shall be fitted with vapour recovery systems.

12. The opacity of any smoke emissions shall not exceed a level of 1 as measured on the Ringelmann Scale.

13. The consent holder shall control all emissions of carbon monoxide to the atmosphere from the flare so that, whether alone or in conjunction with any other emissions from the wellsite, the maximum ground level concentration of carbon monoxide arising from the exercise of this consent measured under ambient conditions does not exceed 10 milligrams per cubic metre [mg/m^3] [eight-hour average exposure], or 30 mg/m^3 one-hour average exposure] at or beyond the boundary of the property where the wellsite is located.

14. The consent holder shall control all emissions of nitrogen oxides to the atmosphere from the flare so that, whether alone or in conjunction with any other emissions from the wellsite, 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 [$\mu g/m^3$] [24-hour average exposure], or 200 $\mu g/m^3$ [1-hour average exposure] at or beyond the boundary of the of the property where the wellsite is located.

15. The consent holder shall control emissions to the atmosphere, from the production station and flare, of contaminants other than carbon dioxide, carbon monoxide, and nitrogen oxides so that, whether alone or in conjunction with any other emissions from the production station, is not hazardous or toxic or noxious at or beyond the boundary of the property.

16. 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 so that, whether alone or in conjunction with any emissions from the flare, the maximum ground level concentration for any particular contaminant arising from the exercise of this consent measured at or beyond the boundary of the property where the wellsite is located, is not increased above background levels:

    a) by more than 1/30th 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

17. The consent holder shall make available to the Chief Executive, Taranaki Regional Council, upon request, an analysis of a typical gas and condensate stream from the field, covering sulphur compound content and the content of carbon compounds of structure C_6 or higher number of compounds.

18. Each time there is visible smoke as a result of the exercise of this consent, the consent holder shall record the time, duration and cause. The consent holder shall make the record available to the Chief Executive, Taranaki Regional Council, upon request.

19. The consent holder shall record and maintain a log of all continuous flaring events longer than five minutes duration, and any intermittent flaring lasting for an aggregate of ten minutes or longer in any 120-minute period. The log shall contain the date, the start and finish times of the flaring event, the quantity and type of material flared, and the reason for flaring. The 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 undertaken or proposed to reduce smoke emissions;
    iv) detailing any measures undertaken or proposed 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.

Lapse and Review

21. This consent shall lapse five 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.

22. 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 within six months of receiving a report prepared by the consent holder pursuant to condition 20 of this consent, and/or by giving notice of review during the month of June 2015 and/or June 2021, for any of the following purposes:

    a) dealing with any significant adverse effect on the environment arising from the exercise of the consent which was not foreseen at the time the application was considered or which it was not appropriate to deal with at the time;
    b) requiring the consent holder to adopt the best practicable option to remove or reduce any adverse effect on the environment caused by the discharge;
    c) to alter, add or delete limits on mass discharge quantities or discharge or ambient concentrations of any contaminant;
    d) taking into account any Act of Parliament, regulation, national policy statement or national environmental standard which relates to limiting, recording, or mitigating emissions of gases which are products of combustion, and which is relevant to the air discharge from the Ngatoro-A wellsite.

Signed at Stratford on 12 May 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:	Greymouth Petroleum Central Limited PO Box 3394 Fitzroy New Plymouth 4341
Decision Date (Change):	2 November 2018
Commencement Date (Change):	2 November 2018 (Granted Date: 1 September 2014)

Conditions of Consent

Consent Granted:	To discharge treated stormwater from hydrocarbon exploration and production operations at the Radnor-B wellsite through a roadside drain into an unnamed tributary of the Piakau Stream
Expiry Date:	1 June 2028
Review Date(s):	2-yearly intervals
Site Location:	Radnor-B wellsite, 15 Radnor Road, Midhirst (Property owner: Airport Farm Trustee Limited)
Grid Reference (NZTM)	1709334E-5649159N
Catchment:	Patea
Tributary:	Piakau

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. The wellsite pad shall be no greater than 2 hectares.

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.

4. The consent holder shall maintain and regularly update a 'Contingency Plan' that details measures and procedures that will be undertaken in the event of spillage or discharges not authorised by this consent, including any discharge that contains stormwater that has flowed onto the wellsite from adjacent paddocks. The plan and any amended versions shall be provided to the Chief Executive, Taranaki Regional Council.

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 original application and any subsequent application to change the conditions of the consent, including;
   - the '*Stormwater Design Report for Radnor wellsite*' submitted with the original application, dated 31 July 2014; and
   - the '*Assessment of Environmental Effects*' (AEE) submitted with the original application, dated 31 July 2014.

6. The consent holder shall take all reasonable steps to prevent stormwater from entering the well site from, the adjacent land, including undertaking the work shown in Appendix 1.

7. All discharges from the site, excluding the stormwater from the bunded areas in the production facility, 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.

8. Skimmer pits shall have a combined capacity of no less than 112.5 m^3 including a 'freeboard' of no less than 146.5 m^3, and be designed to retain any hydrocarbons that enter them.

9. 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.

10. 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.

11. Subject to condition 12 the 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^{-3}
total recoverable hydrocarbons	Concentration not greater than 15 gm^{-3} (as determined by infrared spectroscopic technique)
chloride	Concentration not greater than 230 gm^{-3}

This condition shall apply immediately after the skimmer pit at a designated sampling point approved by the Chief Executive, Taranaki Regional Council.

12. 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 25 metres determined from (NZTM) 1710199E-5648843N.

13. After allowing for a mixing zone of 25 metres, determined from (NZTM) 1710199E-5648843N, 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^{-3}; or
    c) the chloride concentration to exceed 50 gm^{-3}.

14. After allowing for a mixing zone of 25 metres, determined from (NZTM) 1710199E-5648843N, 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.

15. 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.

16. This consent shall lapse on 30 September 2019, 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.

17. 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 at 2-yearly intervals, 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 2 November 2018

For and on behalf of
Taranaki Regional Council

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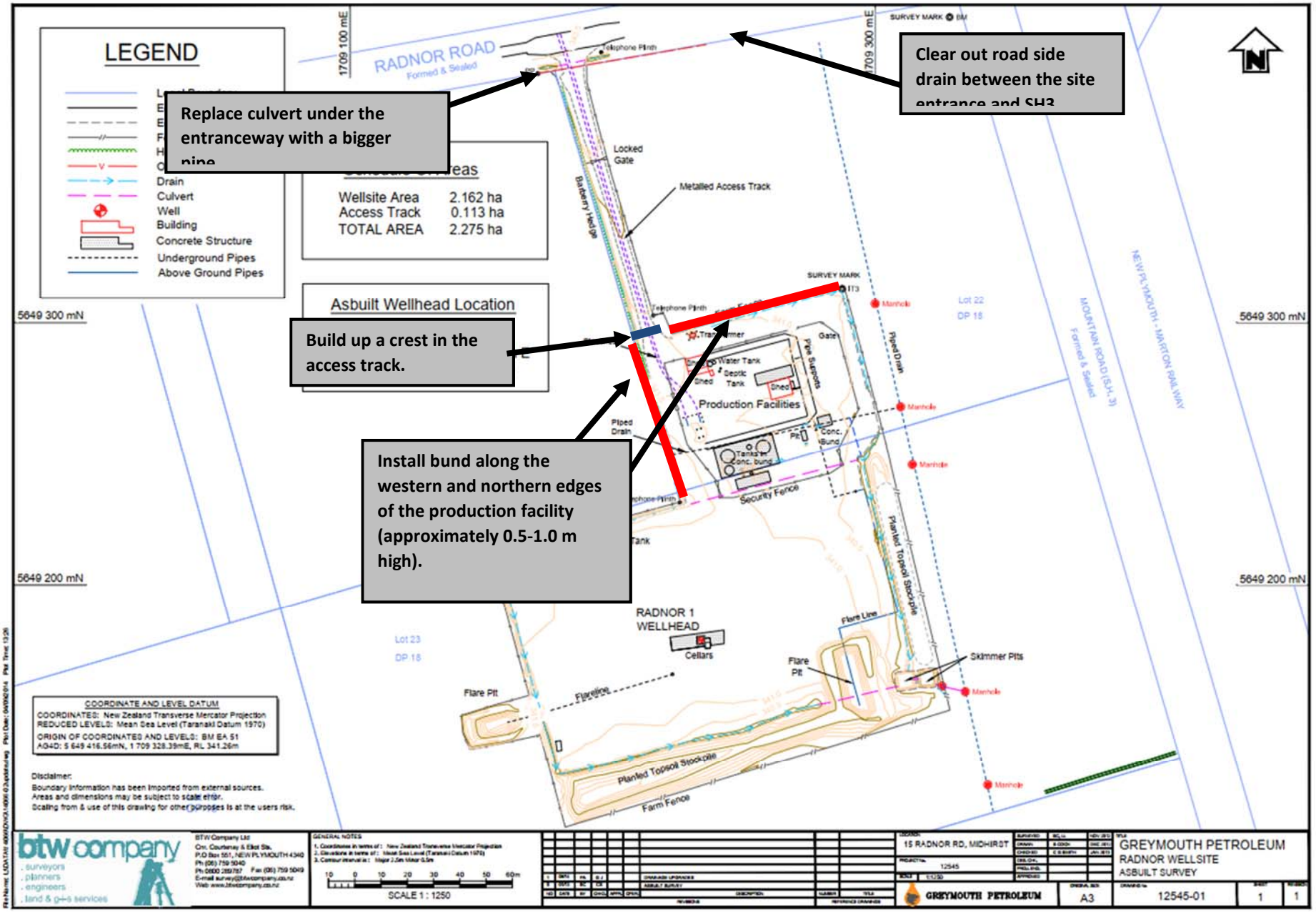
A D McLay
Director - Resource Management

Appendix 1


LEGEND
Drain
Culvert
Well
Building
Concrete Structure
Underground Pipes
Above Ground Pipes
Wellsite Area 2.162 ha
Access Track 0.113 ha
TOTAL AREA 2.275 ha
Asbuilt Wellhead Location
Replace culvert under the entranceway with a bigger pipe
Clear out road side drain between the site entrance and SH3
Build up a crest in the access track.
Install bund along the western and northern edges of the production facility (approximately 0.5-1.0 m high).
RADNOR ROAD
Formed & Sealed
1709 100 mE
1709 300 mE
5649 300 mN
5649 200 mN
Locked Gate
Metalled Access Track
Barberry Hedge
Production Facilities
Water Tank
Septic Tank
Shed
Pipe Supports
Piped Drain
Security Fence
Planted Topsoil Stockpile
Farm Fence
RADNOR 1 WELLHEAD
Cellars
Flare Line
Flare Pit
Flarelines
Skimmer Pits
Manhole
Lot 22 DP 18
Lot 23 DP 18
NEW PLYMOUTH - MARTON RAILWAY
MOUNTAIN ROAD (SH 3)
COORDINATE AND LEVEL DATUM
COORDINATES: New Zealand Transverse Mercator Projection
REDUCED LEVELS: Mean Sea Level (Taranaki Datum 1970)
ORIGIN OF COORDINATES AND LEVELS: BM EA 51
AGD: 5 649 416.56mN, 1 709 328.39mE, RL 341.26m
Disclaimer:
Boundary information has been imported from external sources.
Areas and dimensions may be subject to scale error.
Scaling from & use of this drawing for other purposes is at the users risk.
SCALE 1 : 1250
15 RADNOR RD, MIDHIRST
12545
GREYMOUTH PETROLEUM
A3
GREYMOUTH PETROLEUM
RADNOR WELLSITE
ASBUILT SURVEY
12545-01

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 Central Limited PO Box 3394 Fitzroy New Plymouth 4341
Decision Date	12 November 2019
Commencement Date	12 November 2019

Conditions of Consent

Consent Granted:	To discharge treated stormwater from the Kaimiro Production Station site into an unnamed tributary of the Mangaoraka Stream
Expiry Date:	1 June 2038
Review Date(s):	June 2026, June 2032
Site Location:	1180 Upland Road, Kaimiro
Grid Reference (NZTM)	1699783E-5664369N
Catchment:	Waiongana
Tributary:	Mangaoraka

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 exercise of this consent shall be undertaken in general accordance with the information provided in support of the application for this consent. In the case of any contradiction between the application and the conditions of this consent, the conditions of this consent shall prevail.

2. 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.

3. Stormwater discharged shall be collected from a catchment area of no more than 25,000 m^2.

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.

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.

6. All runoff from the site 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 the skimmer pit without ponding.

7. All skimmer pits, but excluding the sediment pond, 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. Subject to condition 9 the 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^{-3}
total recoverable hydrocarbons	Concentration not greater than 15 gm^{-3} [as determined by infrared spectroscopic technique]
chloride	Concentration not greater than 230 gm^{-3}

Each standard shall apply before the entry of the treated stormwater into the receiving environment at locations shown on the Sampling Point Location Plan (Drawing number 190560-02) attached as Appendix A.

9. The pH may exceed 9.0 if the consent holder demonstrates that 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 15 metres.

10. For the purpose of checking compliance with conditions 11 and 12 the consent holder shall ensure that there is access to the piped stream at a point it can be sampled upstream of the discharge.

11. Immediately downstream of the site access road (NZTM 1699783E- 5664369N) the discharge shall not cause any of the following effects in the receiving water when compared to a sample taken immediately upstream of the discharge:

    a) an increase in the temperature of more than 2 degrees Celsius;
    b) the filtered carbonaceous biochemical oxygen demand to increase by more than 2 gm^{-3}; or
    c) the chloride concentration to increase by more than 50 gm^{-3}.

12. Immediately downstream of the site access road (NZTM 1699783E- 5664369N) the discharge shall not give rise to any of the following effects in the receiving:

    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.

13. 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 2026 and/or 2032 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 12 November 2019

For and on behalf of
Taranaki Regional Council

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A D McLay
Director - Resource Management

Appendix A. Sampling Point Location Plan